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FLORIDA BIRD LIFE

ARTHUR H. HOWELL

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CAROLINA PAROQUETS IN CYPRESS TREES

FLORIDA BIRD LIFE

by

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COLOR PLATES FROM ORIGINAL PAINTINGS BY

FRANCIS L. JAQUES

of the American Museum of Natural History

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in coöperation with

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PREFACE

The United States Biological Survey, in pursuance of its program of studying the wild life and mapping the life zones of North America, instituted in 1918 a systematic survey of the birds and mammals of the State of Florida, assigning the work to the direction of Arthur H. Howell, Senior Biologist in the Division of Biological Investigations.

During succeeding seasons field work was continued and the report on the bird life and the natural life zones was prepared. The manuscript was completed in 1930, at a time when lack of sufficient funds for its publication in an adequate manner indicated indefinite postponement. Fortunately, however, the generous offer of financial assistance from a friend interested in Florida birds made possible the immediate consummation of the project.

A coöperative agreement was thereupon entered into between the Bureau of Biological Survey and the Florida Department of Game and Fresh Water Fish, under whose auspices the present work is now issued.

PAUL G. REDINGTON,
Chief, Biological Survey.

U. S. Department of Agriculture,
Bureau of Biological Survey,
Washington, D. C.
November 11, 1931.

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INTRODUCTION

Florida occupies a unique position biologically among the States of the Union and has been a Mecca for naturalists since the days of Bartram, a century and a half ago. Comprising, as it does, a long narrow peninsula projecting southward into the tropics, and provided with myriad lakes, ponds, marshes, and tidal lagoons, it is an attractive lane of migration for many birds and furnishes an ideal home at all seasons for immense numbers of waterfowl, shorebirds, and swamp-loving species. Birds of these groups include the largest and most striking elements of the avifauna, and nowhere else in North America can be found such populous rookeries of pelicans, Water-Turkeys, egrets, herons, and ibises. In pioneer days, and down to about 1880, the bird life of Florida was astonishingly abundant, and this, in conjunction with the salubrious climate, was the means of attracting hundreds (later thousands) of tourists, hunters, and scientific collectors to the State.

Before the days of travel by rail, automobile, and airplane, the route of easiest access to central and southern Florida was by steamboat on the St. Johns to Lake Monroe, which was the head of navigation for all but the very small steamers that were able to reach Salt Lake, about 45 miles above Lake Harney. From this point a short trip overland brought the traveler to the Indian River, which furnished easy entrance by an inside channel to points farther south on the east coast. Another favorite route to central Florida was by steamer up the St. Johns and Oklawaha Rivers to Silver Spring and Lake Harris. A vivid picture of the bird life along these waterways is presented in Edward H. Forbush's description (1929, vol. 3, pp. xxviii–xxix)[1] of his first trip to Florida in 1877. He writes:

> We took the first boat up the St. Johns River, and from there during the journey to southern Florida we saw what no man ever will see again. Along the upper St. Johns and the Oclawaha the Florida wilderness came down to the river banks and encroached upon and even overhung the stream. In many places on the Oclawaha the semi-tropical foliage with its drapery of Spanish moss entirely overarched the water, so that a steamboat plowing its way along the river, seemed to float in a tunnel of luxuriant verdure. Alligators in numbers swam in streams and ponds or rested on the shores. Uncounted swarms of waterfowl of many species inhabited the waters in innumerable multitudes. Great flocks of White Egrets and ibises, among them the lovely Roseate Spoonbills, possessed the land. Every turn in the river brought into view a new scene, to be scanned for novel forms of interesting life. When we arrived at Lake George, wild ducks were scattered over the lake as far as the eye could see or the glass could make them out; and when, later, we reached Indian River Lesser Scaup Ducks or Bluebills floated upon the water in vast dense flocks, a mile or more in length. Shore birds were seen in multitudes along the coasts and lagoons. Eagles, hawks and owls were common. Wild Turkeys and deer were plentiful and the tracks of bears, panthers and wildcats could be seen on the sands.
>
> Practically all tourists were armed with rifles, shotguns, revolvers, or all three. These armed men lined the rails of the steamboats and shot *ad libitum* at alligators, waterfowl or anything that made an

[1] Figures in parentheses refer to the literature citations beginning on page 476.

attractive target. There were practically no restrictions on shooting, although the steamers never stopped to gather in the game, but left it to lie where it fell.

In addition to the great colonies of gregarious marsh- and swamp-inhabiting birds, there are many other species of unusual interest to be found only in peninsular Florida, such as the Flamingo, the Florida Crane, the Limpkin, the Everglade Kite, the Short-tailed Hawk, the Florida Burrowing Owl, and (formerly) the Carolina Paroquet.

To the naturalist Florida has always been a region of great attractiveness, not only because of its wealth of bird life and the many peculiar and interesting species comprised in its fauna, but also because of the tropical element in the fauna, providing an association of species not found elsewhere in the United States. As early as 1871, the classic paper of Dr. J. A. Allen on the mammals and winter birds of east Florida directed the attention of naturalists to the racial variations presented by the birds of the Florida peninsula and laid the foundation for the delimitation of the life zones of the continent, which was later worked out in greater detail and with wider application, both by him and by Dr. C. Hart Merriam.

With the accumulation of large collections of birds' skins from Florida, initiated about 1870 by Allen and Maynard, it became evident that there existed in the peninsula several well-marked species and many local races of wide-ranging birds, developed there under the peculiar environment. A considerable number of these variant forms have since been named; though some have proved too slightly characterized to be recognized in nomenclature, most of them are now admitted to the State list.[1]

To the sportsman also, Florida has from early days possessed the lure of a bountiful supply of game and a mild winter climate that permitted a long hunting season. The inevitable result has been a great depletion in the numbers of the game animals, particularly of the larger species. Quail are still found in abundance on the prairies and pine flats, and wild turkeys have survived in the more remote sections longer than in most other parts of the Eastern States. Ducks and geese, while much less numerous than in primitive times, are still plentiful during the winter on the extensive marshes and water areas of the State.

In Pleistocene times, Florida evidently possessed a varied and abundant avifauna. Sixty-five species of birds found in fossil deposits in various parts of the State are listed by Wetmore (1931). Of these, 53 species are now living in Florida and 3 are extinct;[2] the following are living species, formerly, but not at present, found in the State:

Manx Shearwater (*Puffinus puffinus*)
Jabiru (*Jabiru mycteria*)
Trumpeter Swan (*Cygnus buccinator*)
South American Turkey Vulture (*Cathartes aura aura*)
California Vulture (*Gymnogyps californianus*)
Whooping Crane (*Grus americana*)
Wood Rail (*Aramides cajanea*)
A South American eagle (*Geranoaëtus* sp.)

The list of Florida birds, herein treated, numbers 423, comprising 362 species and 61 additional subspecies. A hypothetical list is appended of 12 species of birds that have been recorded on evidence considered to be insufficient.

[1] See list of species and subspecies originally described from Florida, p. 38.

[2] The extinct species are a teal, *Querquedula floridana;* a turkey, *Meleagris tridens;* and a large condor, *Teratornis merriami,* originally discovered in the asphalt pits at Rancho La Brea, California.

The birds of the State may be divided into the following categories: Permanent residents, 134; summer residents (departing southward in autumn), 31—a total of 165 breeding species and subspecies; winter residents (those species that arrive in autumn from more northern breeding grounds), 136; regular transient visitors (migratory species passing through the State in spring and fall), 69; accidental or casual visitors, 50; species extinct within historic times, 3.

While the number of breeding species is not large in comparison with that of some other States, the combined lists of winter residents and of permanent residents total 270—an unusually large winter population. This, of course, is accounted for by the mildness of the winter climate and the abundance of bird food available.

The Florida peninsula furnishes a highway for thousands of the smaller land birds during their migrations in spring and autumn to and from the West Indies and South America. Even greater numbers of migrants, as Cooke (1915, p. 13) has shown, pass over northwestern Florida in their flights across the Gulf of Mexico, though by no means all the species, and only a fraction of the individuals, alight on Florida soil. The lighthouses along the coasts annually lure to destruction many hundreds and sometimes thousands of migrating birds, which, confused by foggy weather and dazzled by the light of the lantern, dash themselves against the glass or the iron framework around the light. The largest flights of migrants are reported from the lighthouses off the southern tip of the peninsula—Sombrero Key and Alligator Reef. The frequent tropical hurricanes that blow across the Florida peninsula are doubtless responsible for the occurrence in the State of a number of Antillean species, such as the Anis, the Jacana, the two Grassquits, the Bahama Honey Creeper, the Bahama Swallow, the Cuban Cliff Swallow, the Cuban Martin, and several West Indian doves and pigeons.

EXPLANATIONS AND SOURCES OF INFORMATION

Many of the data on which this work is based were obtained by the author and his assistants during eight trips into various parts of the State;[1] these were supplemented by field notes of other members of the Biological Survey staff and by the incomparable series of records in the files of that organization. In addition, more than a score of bird students and collectors have given their hearty coöperation by generously making their field notes available for examination or by collecting important specimens on request. Besides this original material, the author has carefully scanned the literature treating of Florida birds, and has examined thousands of Florida specimens in various museums and private collections.

Records of the migratory movements of birds in Florida have been coming to the Biological Survey from a score of voluntary observers over a period of 46 years, and this has resulted in the accumulation of much important information on migration. All these records have been used in summarizing the periodical movements of migratory species.

The general ranges of the species have been abridged from the fourth edition of the American Ornithologists' Union's Check-List of North American Birds, and the scientific names agree in most cases with that list. The few exceptions consist in the inclusion of

[1] For the itinerary of these trips, see pp. 36–37.

certain subspecies not recognized by the A. O. U. Committee, but which, as a result of special studies, are considered recognizable.

ILLUSTRATIONS

The thirty-seven illustrations in color and the two plates in black and white of soaring hawks are reproduced from original paintings in oil and watercolor by Francis L. Jaques, of the American Museum of Natural History. It has been the intention to portray the more striking and unusual birds characteristic of Florida, together with those other species most likely to be confused in the field.

It has usually been the custom to group on one color plate birds of one family. In the field, however, an observer naturally sees numbers of different kinds of birds associated in their respective habitats. In fifteen of the paintings, therefore, Mr. Jaques has depicted varieties of habitat areas, each with the species most often found there. It is hoped that this innovation in the illustration of a book on birds may prove pleasing and helpful to the reader.

The other illustrations are from photographs, many of them furnished by coöperating naturalists.

The paragraph on recognition marks has been included to assist amateur bird students in the identification of birds in the field or of specimens in the hand. These descriptions have been prepared by the author from museum specimens, and in order to have a definite standard for the names of colors, Ridgway's "Color Standards and Color Nomenclature" has been followed whenever possible. Since this book, however, is not readily accessible to the general reader, the color names used by Ridgway have in some instances been followed by an explanatory term in parentheses. The measurements have been taken mainly from Coues's "Key" and Forbush's "Birds of Massachusetts." The paragraph on food has been omitted in the case of some of the rarer species and in those species concerning which no definite information is available.

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HISTORY OF FLORIDA ORNITHOLOGY

COLONIAL WRITERS (1562–1775)

The earliest recorded observations on Florida birds, so far as I have been able to learn, are those of the French explorer Jean Ribaut, who landed at the mouth of the St. Johns River on May 1, 1562. His report of the expedition has been preserved in the British Museum and has recently been reprinted by the Florida State Historical Society (Connor, 1927). In it Ribaut describes the appearance of the country and mentions a number of birds seen. He called the river the "River of May," and set up at its mouth a monument to claim the region for the king of France. A granite shaft was recently erected there to mark the event; the town at that point is now called Mayport. In the English translation of Ribaut's account, we read:

> And the sight of the faire medowes is a pleasure not able to be expressed with tonge, full of herons, corleux, bitters [bitterns], mallardes, egertes [egrets], woodkockes, and of all other kinds of small birds, with hartes, hyndes, buckes, wild swyne, and sondry other wild beastes . . . Also there be cunys, hares, guynia cockes [turkeys ?] in marvelus numbre, a great dele fairer and better than be oures . . .

In 1763 appeared a small volume by William Roberts entitled "An Account of the First Discovery and Natural History of Florida," in which it is stated that "Birds are here in great plenty, such as partridges, jays, pigeons, turtle doves, thrushes, crows, hawks, herons, cranes, geese, ducks, and an infinite number of others."

Another early work on the State is that by Dr. William Stork who resided for some years on a plantation on the eastern shore of Lake George. In 1766 he published a small volume entitled "Account of East Florida," in which he mentions briefly a few birds—wild turkeys, pheasants (?), American partridges, wild pigeons, cranes, curlews, pelicans, sea-gulls, and some others.

In the winter of 1765–66, John Bartram, who had been appointed by King George III "Botanist for the Floridas," made a journey from St. Augustine "up the River St. Johns as far as the Lakes," taking with him his son William. Portions of his journal made on this trip were published in 1769 by William Stork in his Description of East Florida; the journal treats the flora in detail, but mentions birds only casually.

Captain Bernard Romans, in 1771, explored nearly the entire coast of Florida, rounding Cape Sable, visiting the Lower Keys, and sailing up the west coast to Pensacola. He also traveled across the peninsula, from Tampa Bay to St. Augustine. His book, A Concise Natural History of East and West Florida, published in 1775, contains extended descriptions of the country and of the Indians, but only brief mention of birds. At the mouth of the St. Lucie River he killed numbers of deer and turkeys.

BARTRAM'S TRAVELS

In April, 1774, William Bartram, under the patronage of Doctor Fothergill, a wealthy Quaker naturalist of England, began a series of explorations of great importance. His account of his journeys (1791) has become a classic and contains interesting and valuable descriptions of the flora and fauna of the regions visited. Starting from Cow-ford, on the St. Johns River (near the present site of Jacksonville) in a small boat, for which he paid 3 guineas, he sailed alone up the river and into Lake George. Of this trip he says: "My little vessel being furnished with a good sail, and having fishing tackle, a neat light fusee, powder and ball, I found myself well equipped for my voyage, about 100 miles to the trading house." Camping on the shores of Lake George, he tells of hanging some pieces of broiled fish left from his supper on the snags of some shrubs overhead, and while he was asleep they were carried off by a wolf. He attributes his escape from bodily harm to the protecting care of his "guardian angel." After the completion of this boat trip, he made a journey overland with some companions to the Alachua Savanna, and later a more extended journey to Tallahassee and Cuscowilla. In August, 1777, he visited Pensacola, going there from Mobile in a sailing vessel.

Although primarily a botanist and engaged in collecting plants, Bartram recorded many observations of birds. Writing of his experiences soon after he entered Florida, near Amelia Island, he says:

> We pitched our tent under the shelter of a forest of Live Oaks, Palms, and Sweet Bays; and having in the course of the day, procured plenty of sea fowl, such as curlews, willets, snipes, sand birds, and others, we had them dressed for supper, and seasoned with excellent oysters . . . Our repose, however, was incomplete, from the stings of musquetoes, the roaring of crocodiles [alligators] and the continual noise and restlessness of the sea fowl, thousands of them having their roosting-places very near us, particularly loons of various species, herons, pelicans, Spanish curlews, etc.; all promiscuously lodging together, and in such incredible numbers, that the trees were entirely covered.

Of his journey up the St. Johns River, he writes: "Parroquets are commonly seen hovering and fluttering on their tops [cypress trees]; they delight to shell the balls, its seed being their favourite food."

Concerning the region near the Alachua Savanna, Bartram says (*op. cit.*, p. 247):

> There was a little hommock or islet containing a few acres of high ground, at some distance from the shore, in the drowned savanna, almost every tree of which was loaded with nests of various tribes of water fowl, as ardea alba, ar. violacea, ar. cerulea, ar. stellaris cristata, ar. stellaris maxima, ar. virescens, colymbus, tantalus, mergus and others; these nests were all alive with young, generally almost full grown, not yet fledged, but covered with whitish or cream coloured soft down. We visited this bird isle, and some of our people taking sticks or poles with them, soon beat down, and loaded themselves with these squabs, and returned to camp; they were almost a lump of fat, and made us a rich supper; some we roasted, and made others into a pilloe with rice; most of them, except the bitterns and tantali, were so excessively fishy in taste and smell, I could not relish them.

Again, after describing a "savanna crane" that had been killed by the party, he says: "We had this fowl dressed for supper and it made excellent soup; nevertheless, as long as I can get any other necessary food, I shall prefer their seraphic music in the ethereal skies, and my eyes and understanding gratified in observing their economy and social communities, in the expansive green savannas of Florida." Bartram's description of

this bird formed the basis for the name now in use for the Florida Crane, *Grus canadensis pratensis.*

At that early date little was known about the migrations of birds. Bartram, however, had observed the migratory movements with some care, and in his book he gives a list of 215 species, indicating (a) those that migrate north to Pennsylvania to breed; (b) those that breed farther north and winter in Pennsylvania, the Carolinas, and Florida; (c) those that reach Florida and Carolina from the south and breed but do not pass farther north; (d) those that are permanent residents in Carolina and Florida; and (e) those that are permanent residents in Pennsylvania. His list of permanent residents in Florida and Carolina numbers 20 species, and that of migratory species summering there, 15. Many of the species given in the other lists probably were observed in Florida, but can not with certainty be accredited to the State.

The names used by Bartram are in many cases quite unlike those now in use, but the majority of the birds are identifiable, either by the names themselves or from the brief descriptions that accompany them. Dr. Elliott Coues (1875) studied the list with great care and was able to identify all but 52 of the species. Bartram described the Limpkin, or "crying bird," as *Tantalus pictus;* the White Ibis in adult plumage as *Tantalus albus*, and in immature plumage as *Tantalus versicolor*—both called "Spanish curlew"; and described the Wood Ibis as *Tantalus loculator*—called "wood pelican." He also described two supposedly new species of vultures. One was the well-known Black Vulture, or Carrion Crow; the other was his famous "painted vulture," *Vultur sacra*, an apparently mythical species having some of the characters of the King Vulture of South America (*Gypagus papa*), but differing from it in having a white tail and "a large portion of the stomach hanging down on the breast, in the likeness of a sack or half wallet." These vultures he reported as gathering in numbers on the prairies after a fire to feed on "roasted serpents, frogs, and lizards." No such bird has been seen by later observers, and we are forced to the conclusion that Bartram in this case drew on his imagination or repeated some tale related to him by others.

EARLY FAUNAL INVESTIGATIONS (1795–1830)

After Bartram's explorations there was a cessation of ornithological activities in Florida for many years. In 1795, Louis Bosc described and named the Florida Jay, but the source of his information is not known.

Vieillot, well known French ornithologist, spent some two years in America early in the 19th century, collecting specimens and obtaining information that he used in his work on American birds. In the introduction to this book (1807, p. 3), he writes of having collected in Florida, but no details of his visit are recorded. In 1817, he described the Florida Jay, under the name *Corvus cyaneus*, based without doubt on a specimen taken by himself.

In February and March, 1818, George Ord, of Philadelphia, patron of Alexander Wilson, journeyed to Florida in company with William McClure, Thomas Say, and Titian R. Peale, the last a youth of 18 years. They ascended the St. Johns River to "Picolata" [Palatka], and crossed from there to St. Augustine on foot, where they presented their

passports to the Governor of Florida, which was then a Spanish province. On account of the hostility of the Indians they were forced to give up further explorations and return home to Philadelphia.[1] At the meetings of the Philadelphia Academy on May 19 and 26 of that year, Ord presented brief papers on the habits of the Boat-tailed Grackle and the Florida Jay.

Titian R. Peale, a talented young artist and enthusiastic naturalist, was engaged by Charles Lucien Bonaparte in 1824 to go to Florida in search of new or rare species of birds. He kept a manuscript diary of his journey and this was found many years later by S. N. Rhoads in a shop in Philadelphia. After passing into the possession of Colonel John E. Thayer, it was presented by him to the Museum of Comparative Zoölogy, where presumably it still is, though unfortunately it can not now be found. Bonaparte (1825, p. 28) recorded the birds that Peale had added to the Florida fauna, but omitted any statement of their habits or of the localities where they were taken. These were the White-tailed Kite, White-crowned Pigeon, Zenaida Dove, and Limpkin—the last two described as new. He also named an egret for Peale, *Ardea pealii*, but this is now known to be the white phase of the Reddish Egret. The details of Peale's journey are not known, but his capture of the Zenaida Dove indicates that he must have gone to the Florida Keys, since this species has never been found on the mainland.

John Lee Williams published a small volume in 1827 entitled "A View of West Florida," which contains a list of 119 species of birds accredited to the State. He admits that his ornithology was very imperfect, but mentions those birds that are most common. On comparison of his list with that of Bartram (1791) it is evident from the similarity of the Latin names and the arrangement that Williams copied largely from Bartram, and he added practically no new information. In his preface he states that he had resided for seven years in Florida and had "made a minute survey of the coast, from St. Andrew's Bay to the Suwannee, as well as of the interior of the country in which Tallahassee is situated."

Ten years later, in 1837, Williams published another book on The Territory of Florida, covering the entire State. He says:

> I have traversed the country in various directions and have coasted the whole shore of the Peninsula, from Pensacola to St. Mary's, examining, with minute attention, the various clusters of Keys or Islets, that are grouped on the margin of the coast. I have ascended many of the rivers, explored the lagoons and bays, traced the ancient improvements, scattered ruins and its natural productions, by land and by water.

His geographical information is detailed and apparently accurate, but he was no ornithologist. In this volume he listed 77 species, with few annotations, made up from his previous list, with some omissions and a few additions. Many of the names are quaint and there are numerous typographical errors. Evidently the large birds impressed him most, for he devotes a paragraph each to the Sandhill Crane, the Spoonbill, and the Flamingo. Of the Water-Turkey he says: "It is supposed to be the Ibis of the Egyptians. It haunts the streams and lakes of the interior. These birds usually sit over the water on some pendant limb, from which they suddenly drop, when disturbed, and sink to the bottom, where they may be seen walking, if the water be clear."

[1] Cf. Weiss and Ziegler, "Thomas Say," pp. 54–60, 1931.

Although three volumes of Audubon's Ornithological Biography had been published by this time, Williams's work shows no evidence of his having consulted them.

In the spring of 1830, Thomas Nuttall, botanist and ornithologist, made a journey through the Southern States, from Charleston to northern Alabama, then south to western Florida and into southern Georgia. So far as known, no account of the trip has been published, and our knowledge of his itinerary is fragmentary, gathered from casual references in his Manual (1832–1834). He refers several times to observations made in western Florida in the month of March, and mentions seeing the Carolina Wren at Tallahassee.

AUDUBON'S EXPLORATIONS

John James Audubon, our greatest pioneer ornithologist, had long desired to explore "the Floridas"; and in the winter of 1831–32 he was enabled to do so. Leaving Washington about October 15, 1831, with two assistants—Henry Ward, an English taxidermist, and George Lehman, a Swiss landscape painter—he stopped for field work at Charleston, and there made the acquaintance of the Rev. John Bachman, who took the party under his hospitable roof. They remained there about a month, and thus began the lifelong friendship between Audubon and Bachman which so profoundly influenced the careers of both men. On November 15, the party sailed for Florida on the Government schooner *Argus*. On November 24 they were at St. Augustine (Audubon writing to Richard Harlan) and here they spent about three weeks. After sailing down the Matanzas River about 35 miles they were entertained for 10 days at the plantation of General Hernandez.

On Christmas morning they set out afoot for the plantation of John Bulow, 15 miles farther south. On December 28, they made a trip with Mr. Bulow down the Halifax River to a spot called Live Oak Landing. Here they ran into a cold "northeaster" that blew most of the water out of the river and marooned the party on a mud flat. Describing his experiences, Audubon writes (1832b):

> The wind freshening, the cold augmenting, the provisions diminishing, the waters lowering, all—all depreciating except our enterprising dispositions. We found ourselves fast in the mud about 300 yards from a marshy shore, without the least hope of being able to raise a fire, for no trees except palm trees were near, and the *grand diable* himself could not burn one of them. Our minds were soon made up what to do—what? Why, roll ourselves in our cloaks, and lay down, the best way we could, at the bottom of our light and beautiful barque. Good God, what a night! To sleep was impossible; the cold increased with the breeze, and every moment seemed an hour . . . but the morn came, clear as ever morn was, and the north-easter as cold as ever wind blew in this latitude. . . . Our only resort was to leap into the mire, waist deep, and to push the barque to a point, some 500 or 600 yards, where a few scrubby trees seem to have grown to save our lives on this occasion. "Push, boys, push! Push for your lives!" cry the generous Bulow, and the poor Audubon. "All hands push." . . . It took us two hours and a half to reach the point . . .

After more wading they finally reached a solid shore and abandoned the boat, walking back to Bulow's home.

On January 6, 1832, the party went to Spring Garden Creek and Dexter's Lake, where Audubon suffered further disappointment in the loss of a pair of ibises which he believed to be new to science, but which he was unable to recover because of the muddy

bottom of the pool into which they had fallen. His impressions of northern Florida were, on the whole, rather unfavorable. He writes on this occasion (1832c):

> Here I am in the Floridas, thought I, a country that received its name from the odours wafted from the orange groves . . . and which from my childhood I have consecrated in my imagination as a garden of the United States. A garden, where all that is not mud, mud, mud, is sand, sand, sand; where the fruit is so sour that it is not eatable, and where in place of singing birds and golden fishes, you have a species of ibis that you cannot get when you have shot it, and alligators, snakes, and scorpions.

And yet, judged by present day conditions, he must have had good success in collecting. At one place he says: "The birds, generally speaking, appear wild and few—you must be aware that I call birds few when I shoot less than 100 per day." However, as Doctor Herrick has pointed out, most of the birds killed were utilized, either made into skins and sent to European museums or kept in his private collection to be used in describing the variations in the species. Large numbers of anatomical specimens, also, were preserved for MacGillivray's use in the technical studies that he made for Audubon's books.

Early in February a voyage was made in the Government schooner *Spark* from St. Augustine into the St. Johns River, to a point about 100 miles from the mouth. On February 12, however, the vessel, being in need of repairs, was suddenly recalled, and Audubon thereupon engaged two men to take him and his two assistants in a smaller boat by a short cut to St. Augustine. Traveling all day, about 40 miles, they landed where they expected to find a wagon, but being disappointed, one of the party was left in charge of the baggage, while Audubon and the other assistant, with their Newfoundland dog, started to walk to St. Augustine, a distance of 18 miles. Night overtook them and a violent thunderstorm descended upon them, but they kept on and finally arrived at their hotel, drenched and mud-covered.

On April 15, 1832, the opportunity came to visit southern Florida, and on that date Audubon's party proceeded down the coast in the revenue cutter *Marion*, commanded by Robert Day. There is no record of any explorations by them along the east coast until they reached Indian Key on April 24. During May, Audubon visited Key West, Mule Keys, the Tortugas, and Sand Key, 6 miles south of Cape Sable. At Sand Key he found birds very abundant, and recorded as breeding there the White Ibis, Brown Pelican, Purple (Little Blue?) Heron, Louisiana Heron, White Heron, Green Heron, Purple Gallinule, Florida Gallinule, Cardinal Grosbeak, and pigeons (White-crowned?). Of this locality he writes (1834, vol. 2, pp. 316, 345):

> The flocks of birds that covered the shelly beaches, and those hovering overhead, so astonished us that we could for awhile scarcely believe our eyes. The first volley procured a supply of food sufficient for two days' consumption. . . . Our first fire among a crowd of the Great Godwits laid prostrate 65 of these birds. Rose-colored Curlews stalked gracefully beneath the mangroves. Purple Herons rose at almost every step we took, and each cactus supported the nest of a White Ibis.

On Sand Key, May 28, 1832, Audubon shot three European Greenshanks; since that time no other specimens have been obtained in America. In these waters, also, he made the acquaintance of the Great White Heron, which he described in 1835 in his Ornithological Biography. On certain of the keys near Indian Key he found the Zenaida Dove breeding, and on Key West, the Key West Quail-Dove, both apparently in some numbers; later

collectors have failed to find either species breeding there, and only three specimens of the Quail-Dove have since been taken in Florida. Audubon mentions having filled a cask with water "from a fine well, long since dug in the sand of Cape Sable, either by Seminole Indians or pirates," but apparently he did no hunting on the mainland shore. He thus missed the opportunity to secure the Cape Sable Seaside Sparrow, which was not discovered for nearly a hundred years (1918).

EXPEDITIONS FROM 1842 TO 1867

Following Audubon's intensive studies in the State, very little was added to the knowledge of Florida birds for more than a decade. This was perhaps due in part to the disturbed state of the country during the war with the Indians.

One of the first expeditions into the Everglades was conducted not primarily for exploration or for nature studies, but in search of Indians, during the Seminole War in 1842. The expedition, which was under the United States Navy, consisted of 83 sailors and marines, with their officers, and one negro, one Indian, one squaw, and one papoose. They traveled in 16 canoes, which at times had to be hauled through the saw grass. Entering the Everglades a little north of Miami, the expedition worked northward along the eastern side of the glades to Lake Okeechobee, thence coasted the southern and western shores of the lake, past Fish-eating Creek, and up the Kissimmee River to Lake Tohopekaliga, and returned by much the same route.

George Henry Preble, then a young midshipman (later a rear admiral) commanding one of the divisions, kept a diary of the trip, in which almost daily he entered notes on the birds seen or shot for food. Unfortunately, this was not published until long after his death (Preble, 1905, pp. 26–46). It presents a graphic picture of primitive conditions in this then remote and practically unexplored wilderness. A few quotations from it will serve to indicate the abundance of the bird life there:

> Sunday, March 6—[on Fish-eating Creek] saw immense flocks of cranes [herons], pink spoonbills, curlew [ibis], and wild turkeys in plenty. . . . The day was rendered harmonious by the warblings of multitudes of feathered choristers, and the night hideous with the splash of alligators, hooting of owls, and screamings of unquiet night-birds.
>
> Monday, March 7.—At sundown landed and pitched our tents under a cypress grove and feasted sumptuously on wild turkey, broiled and fried curlew, plover, and teal, stewed crane, grecian ladies [Water-Turkey] and fried fish, our spoils of the day.

On the lower Kissimmee River Preble mentions seeing large flocks of "green paroquets" and immense flocks of "curlew" (White Ibis) "flying in two irregular columns, each apparently miles in length." The expedition subsisted largely on birds and other game killed along the way. On one day, in the Everglades, he writes: "Captured forty white cranes [egrets], and might have taken a thousand had I wanted, and hats full of eggs; also a dozen water turkeys and some fish."

Edward Harris, of Moorestown, New Jersey, friend and patron of Audubon, visited southern Florida in the spring of 1844, and on April 29, near the head of the Miami River, discovered the Everglade Kite and collected the first specimens taken in the United States. No further details of his trip seem to have been recorded.

Four years later, in May, 1848, John Krider, well-known taxidermist of Philadelphia, conducted an expedition to Florida, working at Miami, Key West, and Charlotte Harbor. Dr. A. L. Heermann, ornithologist, later connected with the Pacific Railroad Surveys, was in the party, and at Charlotte Harbor where most of his collecting was done, he obtained the first specimens of the Black-whiskered Vireo taken in the United States.

William Gambel, ornithologist, and associate of Nuttall, is known to have visited Florida in 1848, but no record of his trip has been found. Possibly he was with Krider and Heermann during a part of their journey.

During the decade from 1850–1860 Dr. Henry Bryant, ornithologist, of Boston, traveled extensively in Florida, but little seems to be recorded as to the dates or details of his trips. His most extended paper on his Florida observations (1859a), presented, in his absence, before the Boston Society of Natural History on January 19, 1859, treats of 25 species and contains full notes on the habits of many little-known Florida birds, including Audubon's Caracara, the Florida Jay, Limpkin, Florida Crane, Wood Ibis, Great White Heron, and Brown Pelican. Scanning the localities mentioned in the paper we learn that Doctor Bryant resided at New Smyrna; that he explored the St. Johns River from its mouth to Lake Harney; visited Pelican Island, in Indian River; ascended the St. Sebastian River to its head; was at Jupiter Inlet and on the Miami River; and visited Sandy Key, near Cape Sable, the Florida Keys, and the Tortugas. He found the Ivory-billed Woodpecker abundant near Enterprise and the Roseate Spoonbill breeding in great numbers at Pelican Island—so numerous that a hunter was reported to have killed 60 in a day.

In the German ornithological journal, Naumannia (1854), there is a brief article by Alexander Gerhardt, who was living in Florida at the time, giving a running account of a number of birds he observed on February 23 of that year, at the mouth of the St. Johns River.

Gustavus Würdemann, in charge of tidal observations of the United States Coast Survey on the Florida reefs and Gulf of Mexico, from 1856 to the time of his death in 1859, devoted considerable energy to collecting birds. During those years, he sent to the Smithsonian Institution 188 specimens of birds obtained on the Tortugas, the Florida Keys, Key Biscayne, Amelia Island, the lower St. Johns River, and at Charlotte Harbor and Cedar Keys. Among these were the Noddy and Sooty Terns, Limpkin, Man-o'-war-bird, Ani, White-crowned Pigeon, Flamingo, and other rare or interesting species. His notes (1861, p. 426) on the birds' habits contained much that was new, and his account of pursuing and capturing alive about a hundred Flamingoes, which by reason of having molted their wing feathers were unable to fly, is most interesting. About 500 birds were seen in the flock discovered among the small keys near Indian Key. One of the herons collected by Würdemann was named by Professor Baird as a new species, *Ardea würdemanni*, but this is now believed to be a hybrid between the Great White and the Great Blue Herons. A specimen of the Bahama Honey Creeper obtained on Indian Key was made the type of *Certhiola bairdii* by Cabanis; this is now referred to *Coereba bahamensis*.

From March 14 to April 7, 1859, Dr. James G. Cooper, author of Ornithology of California, collected birds on the Miami River, as is indicated by the records of 93 speci-

mens listed in the catalogue of the United States National Museum, though apparently he never published anything about the trip.

Dr. Joseph B. Holder, later connected with the American Museum of Natural History, was medical officer at Fort Jefferson, Dry Tortugas, from 1859 to 1869, and some years later he published articles in The American Sportsman (1874, pp. 276, 290) on the habits of the Frigate Bird and Brown Pelican observed at that station.

George Cavendish Taylor, an English zoölogist, was in Florida from March 24 to April 18, 1861, collecting birds at New Smyrna, Enterprise, Orange Mills (near Palatka), and along the St. Johns River. His report, published in The Ibis (1862, p. 127), lists 61 species observed and contains many notes on their habits. He obtained a few Paroquets but no Ivory-billed Woodpeckers. Roseate Spoonbills were breeding then on the Indian River and some young individuals were brought to him by the natives.

John Muir, while on a thousand-mile walk in the fall of 1867 from Louisville, Kentucky, to the Gulf, crossed Florida from Fernandina to Cedar Keys. Arriving there on October 23, he was taken seriously ill with typhoid fever, and in a weakened condition was obliged to remain until January, when he sailed for Cuba on a lumber schooner. As indicated by the notes in his published journal (1916), Muir was chiefly interested in the plant life of the country, but although not acquainted with many of the birds, he mentions a number seen at Cedar Keys, including pelicans, geese, Robins, Bluebirds, Mockingbirds, Mourning Doves, and "the delightful Brown Thrashers." The Crows, he remarks, "are here, some of them cawing with a foreign accent." His well-known charming literary style is illustrated by a quotation from his journal at Cedar Keys:

> It is delightful to observe the assembling of these feathered people from the woods and reedy isles; herons white as wave-tops, or blue as the sky, winnowing the warm air on wide quiet wing; pelicans coming with baskets to fill, and the multitude of the smaller sailors of the air, swift as swallows, gracefully taking their places at Nature's family table for their daily bread. Happy birds!

MODERN FAUNAL INVESTIGATIONS (1868–1930)

The expedition conducted by J. A. Allen in the winter of 1868–69 marked the beginning of intensive studies of the Florida avifauna. During that season, for a period of three months, he made extensive collections along the St. Johns River, between Jacksonville and Enterprise. Of this trip, Doctor Allen writes (1916, p. 20):

> This journey was made, with two volunteer assistants [Rev. Thomas Marcy and J. E. Brundage], in a ship's yawl fitted with a large sail. As the country was then only slightly settled above Palatka, our boat was our home and base of supplies, but at times we occupied rude huts that had been deserted by their former occupants. Parakeets were still abundant, and alligators had almost undisputed possession of the bayous and river banks.

Large series of specimens were obtained for the Museum of Comparative Zoölogy, which he was then representing, and these furnished the basis for Doctor Allen's epochal paper (1871) on variation and life zones.

During the same winter that Allen was in Florida (1868–69), Charles J. Maynard, naturalist, of West Newton, Massachusetts, began a long series of observations and collections in the State, which led eventually to the publication of an important work, The

Birds of Eastern North America. His account (1881, p. 181) of his initial experiences in Florida shows his enthusiasm for ornithology and his method of approach:

> On the thirty-first day of December, 1868, I found myself for the first time, gun in hand, in the piny woods of Florida. As this was then, comparatively speaking, an unknown section to ornithologists, I was naturally anxious to find what birds occurred there. I had not gone far when I saw a Flycatcher perched on the lower branch of a pine, but some distance above my head; this I instantly shot, and, upon picking it up, was a little disappointed at finding that it was a Phoebe, for after traveling so far I expected to find something with which I was not quite so familiar, but later in the day I secured several fine birds that I had never seen living before, and as I always consider it necessary to actually shoot every species, in order to be absolutely sure of their identification, I was contented for I had proved beyond a doubt that this Flycatcher wintered in Florida.

This first expedition, described by him in a series of articles in the American Sportsman for 1874, was made in a sailboat from Jacksonville to Mandarin (December 30—January 26), thence by steamer to Lake Harney (January 28–31), overland by wagon to Sand Point on the Indian River, and across by boat to Haulover Canal, where a permanent camp was established (February 7). Here he remained until March 19, when he sailed north through Mosquito Lagoon and Halifax River to "Beauleaugh's Landing," [1] then went by wagon to Long's Landing on Matanzas River, and from there to St. Augustine in a sailboat. His camp on Indian River was just north of the Haulover Canal and about a mile and a half from the famous Dummitt's Grove on Mosquito Lagoon. The specimens taken there were labeled "Dummitt's" and many of them were listed in Allen's paper on Mammals and Winter Birds of East Florida (1871). Maynard's account of the trip (1874b; 1928b) contains many interesting details of their experiences, as well as an outline of the life of Captain Dummitt.

Maynard went to Florida again in the fall of 1870, this time accompanied by Henry W. Henshaw, later chief of the Biological Survey. They arrived at Cedar Keys on November 6, but Maynard, finding conditions rather unsatisfactory for collecting, left after a few days for Key West, where he stayed from November 11 to January 1. On January 4, 1871, he visited Indian Key, and on January 8 he and Henshaw established themselves at Miami, where they worked together until April 22, collecting large series of birds, after which Maynard and his wife started on a cruise among the Florida Keys to Key West, which lasted until May 1. While at Key West, on December 1, 1870, Maynard took a specimen of the Mountain Plover—the first one known from east of the Mississippi River. In the Everglades, near the head of the Miami River, he and Henshaw made the acquaintance of the Everglade Kite (which at that date had been seen only a few times in Florida) and obtained several sets of its eggs. This experience was interestingly described by Maynard in his Birds of Eastern North America (1881, p. 285). Large series of bird skins, chiefly of the common land birds, were obtained at Miami by Maynard and Henshaw. On January 19, 1871, Henshaw took a specimen of the Grassquit (*Tiaris bicolor*), a Bahaman species, of which this is the only United States record.

In the spring of 1872, Maynard made his third trip to Florida, and explored the St. Johns River region near Blue Springs (January 4 to late in February) and revisited his old collecting station near Dummitt's grove on Indian River (April and May). At Salt

[1] Apparently the same place mentioned by Audubon as "Bulow's."

Lake, a few miles west of Titusville, on March 17, 1872, he first discovered the Dusky Seaside Sparrow. In 1874, he worked at Cedar Keys from January 26 to March 1. From there, in a small yacht he went down the coast as far as Clearwater, but from that point he was obliged to return home on account of illness, leaving his assistants to complete the trip, which took them as far as the Tortugas. In company with August Koch, he went to Florida in the yacht *Nina* in the fall of 1876, reaching Nassau River on January 11, 1877, and doing some collecting along the lower St. Johns River until February 1. In October and November, 1881, and again from November 4, 1883, to January 6, 1884, he collected at Rosewood, in Levy County, and explored the near-by Gulf Hammock; and in January, 1884, he visited Key West on his way to the Bahamas. From March 1 to May 25, 1885, he camped on the Sackett Place on Banana River, exploring the northern portion of Merritt Island, and from September 26 to October 26, 1887, he was located at Sanford, studying the migration. During the winter of 1900–01 (December 25 to February 22), he collected along the St. Johns River from the mouth to Lake Harney, living on the yacht *Cleopatra*, owned by Marland L. Pratt. From February 22 until April 10, 1901, with the exception of a week at Lake Ashby, he worked in the vicinity of Enterprise. For many of these details, I am indebted to Mr. Maynard, who furnished the data a short time before his death.

Maynard's researches and publications played a very important part in the development of Florida ornithology. His work, The Birds of Florida, was issued in 9 parts from 1872 to 1878; these were later included in the Birds of Eastern North America (1881), a revised edition of which was issued in 1895. Two new subspecies were described by him—*Agelaius phoeniceus floridanus* from the Florida Keys, and *Dendroica pinus florida* from Lake Ashby; he described, also, the White-eyed Towhee and the Dusky Seaside Sparrow, but, unfortunately for him, both had previously been named by others. The thousands of specimens he collected furnished material for critical studies by Dr. J. A. Allen and other naturalists. His descriptions of Florida scenery and of the habits of the birds are both accurate and interesting.

During three successive winters, 1868–1870, George A. Boardman visited Florida, collecting at St. Augustine and Fernandina on the east coast, and at Jacksonville, Green Cove Springs, and Enterprise, on the St. Johns River. His specimens, numbering about 200, were presented to the Smithsonian Institution, and an annotated manuscript list of the birds observed was furnished to Dr. J. A. Allen, who utilized many of the records in his paper on winter birds of east Florida, published in 1871. Some years later Boardman visited Florida several times; at Palatka, February 22, 1881, he obtained the second specimen of the Short-tailed Hawk taken in the State.

N. B. Moore lived for a number of years, between 1869 and 1879, at Manatee. He studied and collected birds in that vicinity and around Sarasota Bay, and he kept detailed notes on his observations; the manuscripts are now in the United States National Museum, together with about 40 of his specimens. Doctor Brewer, in A History of North American Birds (Baird, Brewer, and Ridgway), frequently quotes from Moore's field notes on the habits of Florida birds. Moore was the first to discover the Florida Burrowing Owl, and his specimens, taken 16 miles east of Sarasota Bay, were made the basis of a new subspecies described by Ridgway (1874, p. 216). In the same paper ap-

peared a detailed account by Moore of the habits of these owls. Among other rarities discovered by him were two Avocets and a nest of the White-tailed Kite.

Dr. J. W. Velie, of Chicago, visited Florida in 1872, 1875, 1877, and 1880, but little is known of what he did there. Ridgway (1880, p. 122) reported that Doctor Velie, on one of his trips (doubtless to the Florida Keys), had collected specimens of the Great White Heron and found nests containing both white and blue young.

In April, 1873, Dr. C. Hart Merriam, later chief of the Biological Survey, traveled by steamer up the St. Johns and Oklawaha Rivers from Jacksonville to Okahumpka, on Lake Harris. In his account of the journey (1874, p. 85) he listed 71 species of birds observed. In March, 1893, he made a short trip to Winter Park, of which nothing has been recorded.

By 1873, northern Florida, especially the St. Johns River region, had been pretty thoroughly examined by ornithologists, and the coasts and islands had practically all been visited. The great interior lake, Okeechobee, and the vast area of the Everglades, however, were still practically unknown, and astonishing tales were current as to the wonders of these inaccessible regions and their inhabitants. The publishers of Forest and Stream, shortly after the magazine was launched, organized an expedition to penetrate to Lake Okeechobee and gain first-hand information concerning it. Fred A. Ober, field collector and author of books on the West Indies, was selected to lead the expedition, and in February, 1874, the members of the party proceeded in a boat, constructed for the trip, from New Smyrna to Fort Pierce. Hauling the boat by wagon from Fort Pierce to Fort Bassenger, they launched it on the Kissimmee River, February 20, sailed down river to the lake and around its shores, and returned March 17. Ober (1874a) wrote several letters to Forest and Stream describing the country and his experiences, and on his return published a list (1874b) of 62 species of birds seen on the trip. Thus the myths about the big lake were exploded and its true character was made known.

The same winter an expedition to Florida was organized by Prof. J. W. P. Jenks, later connected with Brown University, Providence, Rhode Island, who was accompanied by Fred Jencks and Erwin I. Shores. The party ascended the St. Johns River, from Jacksonville to Salt Lake, and reached the Indian River by way of Snake Creek; procuring a sail boat, they journeyed southward to Fort Capron. There they met Fred Ober, who was likewise headed for Lake Okeechobee, and the parties proceeded together to Fort Bassenger and down the Kissimmee River to the lake. At Fort Capron on the Indian River, on February 11, 1874, Shores collected a specimen of the Bahama Honey Creeper —the second continental record (Henninger, 1917). Professor Jenks wrote a series of articles in Forest and Stream (1887) describing their experiences in detail.

W. E. D. Scott, naturalist and field collector, began in 1876 a long series of observations and collections in Florida, which proved of great value in making known the facts about Florida bird life. His first expedition was from Jacksonville to Silver Spring by boat, thence by ox-team to Panasoffkee Lake, where he settled on a plantation belonging to Richard Conover, of South Amboy, New Jersey, a patron of Princeton College museum, by which Scott was employed. The Oklawaha River at that date was famous for its abundant bird life. Scott mentions the Roseate Spoonbill as conspicuous along its banks and speaks of constantly seeing Paroquets in flocks of 40 to 100. At Panasoffkee

Lake, also, he found bird life abundant, and was particularly impressed with the Limpkins and Everglade Kites, both of which were common. He remained there from January 1 until late in March, when he returned to Princeton with a load of specimens that required a six-ox team to haul out to Silver Spring.

In the fall of 1879, Scott decided to explore the Gulf-coast region of Florida. A point near the mouth of the Withlacoochee River, some 20 miles south of Cedar Keys, was his first objective, reached from Jacksonville by a boat trip up the Oklawaha to Silver Spring and thence overland by wagon. He was greatly impressed by the marked reduction in bird life along the river, as compared with what he had seen four years earlier. This scarcity he attributed to the common practice of allowing passengers to shoot from the deck of the steamer at any living thing in sight, bird or beast. Camping on a small island near the mouth of the Withlacoochee, Scott and his party collected birds from late October to the third week in January, after which they moved headquarters to Clearwater Harbor, where they remained until the last of March. Here they found bird life very abundant, being not far from the great Maximo Rookery in Tampa Bay, then in the height of its glory with vast numbers of breeding egrets, ibises, cormorants, and pelicans. At that period the Reddish Egret, now practically extinct in Florida, was common, and the Roseate Spoonbill was found in such numbers that a single flock, seen closely bunched on a mud flat, was estimated to cover more than an acre of ground.

Scott resumed his studies of the bird life of the Gulf coast in the spring of 1886, locating at Tarpon Springs. He made this his headquarters for about four years, during which period he surveyed the whole of the west coast from that point southward to Cape Sable, Key West, and the Tortugas. During these years he published a series of papers in The Auk, detailing his observations and recording many new facts of distribution. In the course of his researches, several new races of birds were discovered, including the Florida Clapper Rail (*Rallus l. scotti*), Florida Turkey (*Meleagris g. osceola*), Scott's Seaside Sparrow (*Ammospiza m. peninsulae*), and Marian's Marsh Wren (*Telmatodytes p. marianae*). He was the first naturalist, also, to settle the question of the relationship of the two phases of the Short-tailed Hawk by finding a mated pair preparing to nest, one in the light, the other in the dark phase.

During his voyages down the west coast in 1886 and 1890, he was impressed by the almost entire absence of any rookeries of herons or egrets, which in former years had been very numerous on this coast. The disappearance of these birds was attributed to the destruction wrought by plume hunters, who for a number of years had been systematically "shooting out" these rookeries. Scott met a number of these men, and in his papers in The Auk he gave details of their methods, which he strongly deprecated. In fact, these papers are believed to have been very largely responsible for arousing public sentiment in favor of bird protection in Florida.

Scott's extensive collections were distributed to various museums, principally the American Museum of Natural History, the Museum of Comparative Zoölogy, the Museum of Princeton University, and the British Museum.

Edward Howe Forbush, later State ornithologist of Massachusetts, visited Florida in 1877, collecting birds and other objects of natural history, which were sent to the Worcester [Massachusetts] Natural History Society and to other museums. Following

the customary route at that period, he and his party went up the St. Johns and Oklawaha Rivers on a steamer; from Lake George they crossed overland to Port Orange on the Halifax River, where they outfitted with an old flatboat and a small skiff with a sail, and proceeded southward by easy stages as far as the Sebastian River. The return trip was made through Snake Creek to Lake Harney. Forbush never published a full account of this journey or its results, but in a biographical sketch by Doctor May (1928) some of his experiences are detailed in his own words. He made a second collecting trip in 1886, and also visited the State in 1900 and 1905.

William Brewster, ornithologist, of Cambridge, Mass., later honorary curator of birds in the Museum of Comparative Zoölogy, traveled up the St. Johns and Wekiva Rivers in March, 1877, and on his return published a charming account of his experiences under the title "With the Birds on a Florida River" (1881, pp. 38–44). He saw a single Ivory-billed Woodpecker and a troop of Carolina Paroquets. Limpkins were abundant, and he described their habits and appearance in detail. Brewster made a second trip to Florida, in company with Frank M. Chapman and Charles Slover Allen, in the spring of 1890. The party explored the Suwannee River from Branford to the mouth of the river, floating down the stream on a flatboat provided with a cabin. The period covered, from March 11 to April 1, corresponded approximately with the height of the spring migration. The paper describing the trip (Brewster and Chapman, 1891, pp. 125–138), which presents a delightful picture of this attractive and little-known region, lists 116 species of birds and contains extended notes on the habits of those observed. At the same time Brewster published a special paper on Bachman's Warbler, which was found to be an abundant migrant on the Suwannee. Forty-six specimens of this rare warbler were collected, and Brewster's paper furnished the first detailed account of the bird's habits after that of Audubon.

Charles B. Cory, later curator of zoölogy in the Field Museum, Chicago, first went to Florida in the winter of 1877–78, and an account of the trip was published under the title "Southern Rambles"—a book written in jocular style. His travels carried him up the St. Johns River as far as Lake Harney. In the winter of 1884–85, says his biographer (Osgood), "he rediscovered Florida, fell thoroughly in love with it and adopted it as his own. For the next 20 years without a break he spent all or part of every winter in this state . . . Florida suited him exactly and likewise he suited Florida." He collected many specimens of birds, chiefly on the east coast, from Cape Canaveral to New River, and about 1893 he built a small museum at Palm Beach in which were "four or five hundred mounted birds, a lot of nests and eggs, and a dozen groups of mammals." This collection was destroyed by fire about 1903. Cory's principal contribution to the literature of Florida birds is in a book entitled "Hunting and Fishing in Florida, including a Key to the Water Birds Known to Occur in the State" (1896). The statements in this list concerning bird distribution are of a rather general nature, but include many definite records, and some of considerable importance. In the same year he published a nominal list of the birds of Florida, numbering 352 species.

Col. S. T. Walker, in 1879, collected about 180 specimens of birds at Clearwater, Sarasota, Tampa, and Manatee; among them was the type specimen of *Strix varia alleni*. In 1881, he collected about 57 skins at Milton.

Dr. James A. Henshall, noted fish culturist and writer on angling, spent two winters in Florida, 1878–79 and 1881–82, cruising on the St. Johns and Indian Rivers, among the Keys, and on the west coast as far as Cedar Keys. In Forest and Stream for 1879 he published a few notes on the birds seen, and in his book, Camping and Cruising in Florida (1884), gave a nominal list of 133 species observed in the State. In the spring of 1889 he journeyed from Biscayne Bay around Cape Sable and up the west coast to Tampa; he noted a great scarcity of egrets and Roseate Spoonbills.

Robert Day Hoyt, who lived at Seven Oaks, near Clearwater, from 1881 until his death in 1918, built up a considerable collection of mounted birds, birds' skins, and birds' eggs, which is now in the Florida State Museum at Gainesville. He was a skillful taxidermist and his services were much in demand. He mounted a large number of birds for John Lewis Childs, most of which are now in the Brooklyn (New York) Museum. His published writings were three short papers in The Warbler, treating of the nesting habits of the Ivory-billed Woodpecker, Ward's Heron, and the Roseate Spoonbill.

Charles Willis Ward, conservationist, of Michigan, spent several weeks in 1881 (January 20 to April 10) on Mound Key in Estero Bay, where he studied the habits of the various breeding water birds and collected the type specimen of *Ardea wardi*, named for him by Ridgway. In Ridgway's article (1882, p. 1) are quotations from a letter by Ward, containing notes made by him on the habits and characteristics of the herons. In a later paper Ward (1884, p. 161) gives additional information on *Ardea wardi*, gained from his observations on the Kissimmee River, Lake Okeechobee, and Charlotte Harbor. Although Ridgway considered this bird a distinct species, Ward was convinced that it is a race of *Ardea herodias*. At a later period, Mr. Ward became interested in bird conservation, and in December, 1912, he organized an expedition under the leadership of Capt. J. F. Menge, bird collector and steamboat captain, which proceeded by steamer up the Caloosahatchee River, across Lake Okeechobee and down the New River Canal to Fort Lauderdale, this being the first time such a trip had been possible. An account of the expedition, with mention of the abundant bird life in the Everglades, was published in The Outdoor World and Recreation for February, 1913.

Robert H. Lawrence, of New York City, visited Pelican Island in the Indian River in mid-March, 1882, and found the Pelicans breeding in abundance. Nests containing eggs and young birds in all stages of development covered the ground so closely that it was difficult to avoid treading upon them.

John C. Cahoon, field naturalist, of Taunton, Mass., accompanied by his brother, C. E. Cahoon, spent several weeks in November, 1883, exploring the bays and rivers of the gulf coast of Florida. The only record of the trip is a brief article in The Ornithologist and Oölogist (1885, p. 21) on the breeding of the Florida Burrowing Owl as observed near Charlotte Harbor.

William L. Ralph, later honorary curator of oölogy in the United States National Museum, made numerous trips to Florida between 1883 and 1893, but we have no full record of them. He furnished Major Bendire, however, with extended accounts of the habits of certain Florida birds, chiefly the Raptores, which were published under quotations in Life Histories of North American Birds (1892–96) and constituted an important contribution to that work. Doctor Ralph was primarily interested in birds' eggs and

his large collection of these was presented to the National Museum. From the records in the museum catalogues and from Bendire's book we learn that Doctor Ralph was collecting at San Mateo in April, 1883; April, 1885; April, 1887; March and April, 1888; January to March, 1891; March to May, 1892; and April, 1893; at Rock Ledge and Merritt Island in February and December, 1886, and February, 1887; and at Matanzas Inlet, May 18, 1888. Among the rarities in his collection are two eggs of the Short-tailed Hawk, taken near San Mateo in 1893 and 1899.

Shortly after the organization in 1883 of the American Ornithologists' Union Committee on Bird Migration, of which Dr. C. Hart Merriam was the first chairman, migration records began to be sent to the Committee from several of the Florida lighthouses. Most of these, however, were of little scientific value, because of the carelessness or ignorance of the observers, but there was one notable exception. M. E. Spencer, keeper of the light on Sombrero Key, a small islet in the Strait of Florida, about 35 miles south of Cape Sable, proved to be an exceptionally careful and enthusiastic reporter. Knowing little about birds, Spencer was careful to send in specimens of the heads and wings of the birds striking the light, numbered to correspond with his schedules; his records, therefore, are unusually reliable, the care he took to avoid mistakes being equal to that of a trained naturalist. This is illustrated by one of his letters in which he says:

> Enclosed I send you head and wings of five birds for identification; please return them as soon as possible. Please give English and Latin names and annex the number used in National Museum Bulletin, of which please send me one of latest issue. . . . I received identified specimens marked Cape May Warbler (*Dendroeca tigrina*) which [name] does not agree with No. 90 in Bulletin No. 21 [there listed as *Perissoglossa tigrina*].

Spencer's first observations, covering the period from April to September, 1884, were published by Doctor Merriam in the first report of the Committee (Auk, 1885, p. 61). Later records, continued until May, 1889, and largely still unpublished, are in the files of the Biological Survey. These records are of extreme importance in the study of the bird migrations passing across the sea from Cuba to Florida, furnishing usually the dates of earliest appearance in the United States in spring and the latest occurrence in fall for many species. In addition to great numbers of common warblers and a few rare ones, the list of birds striking the light included a specimen of the Melodious Grassquit (*Tiaris canora*)—the only United States record. A specimen of Bachman's Warbler, killed March 21, 1887, constituted the first record of the bird from the United States after its discovery by Audubon, and the numerous records of Swainson's Warbler were also a surprise to ornithologists.

The years 1884 and 1885 were signalized by the work of several ornithologists whose observations added considerably to our knowledge of its bird life. Edwin M. Hasbrouck, field collector, later connected with the U. S. Geological Survey, collected in Florida from October, 1884, to March, 1885, chiefly in the vicinity of Palatka and on Lake George. In The Ornithologist and Oölogist for 1885 he presented a series of articles under the title "Florida Bird Life," relating some of his experiences. In 1891, he published in The Auk extended papers on the habits and distribution of the Ivory-billed Woodpecker and the Carolina Paroquet, based in part on his observations in Florida.

Col. N. S. Goss, author of the History of Birds of Kansas, visited Cape Sable and

possibly other parts of southern Florida in March, 1885. While there he obtained a specimen of the Scissor-tailed Flycatcher, and made notes on the feeding habits of White Pelicans, which he later published in The Auk.

In the spring of 1885, Dwight D. Stone, of Oswego, New York, spent a few weeks at Warrington, on the west coast of Florida. In The Ornithologist and Oölogist for October, 1885, he published a few notes on the bird migration at that place, including an account of two nights spent in the lighthouse, watching migrating birds. He made another visit to the State in the winter of 1895–96, collecting birds and eggs on the Indian River, in the Lake Okeechobee region, and on Pine Island; near Fort Thompson he took some Burrowing Owls.

Horace A. Kline was in St. Marks in 1885 and 1886, and made observations of birds and collected specimens at that place and along the shore of Wakulla County. He visited, also, Lakes Jackson, Iamonia, and Lafayette. An article in Forest and Stream (1887a) contains some of his bird notes and presents an excellent picture of the abundant bird life on the Gulf shores at that date. Roseate Spoonbills and American Egrets were found in some numbers, and a breeding colony of Laughing Gulls and a few Ivory-billed Woodpeckers were observed.

R. C. Stuart collected birds on the west coast of Florida in 1886 (perhaps also in other years); three specimens of *Ardea würdemanni* and one of *Ardea occidentalis*, taken by him near Cape Sable, are in the National Museum collection. He is probably the "Mr. Stuart" quoted frequently by Davie in his Nests and Eggs of North American Birds.

In 1886 (and for some years previously), J. W. Atkins, a telegraph operator, was located at Punta Rassa and had at that time a collection of 129 birds. Here W. E. D. Scott became acquainted with him in May, 1886, and for several years following published numerous bird records furnished by Atkins. The following year Atkins was transferred to Key West, where he lived for many years and where he continued to observe and collect birds. In July, 1888, he obtained the only specimen known of the local race of the Bobwhite, which some years later was named by Reginald Heber Howe, Jr. Other rarities taken by him on Key West were a White-winged Dove, a Ruddy Quail-Dove, a Scaled Pigeon (only record), two Scissor-tailed Flycatchers, and numbers of Bachman's Warblers.

T. Gilbert Pearson lived at Archer, Florida, from 1886 to 1890, during which period he was enthusiastically collecting birds' eggs and studying the habits of the birds of the region, with particular attention to the herons and other water birds. He published a number of articles in The Oölogist and in The Ornithologist and Oölogist during those years, and later when he became President of the National Association of Audubon Societies he was able to draw upon his knowledge of these birds to prepare a number of life histories for publication in Bird-Lore. His important services in securing protection for Florida bird rookeries are well known. In June, 1918, he made an extended journey along the Gulf coast from Corpus Christi, Texas, to Key West, Florida, studying the feeding habits of the Brown Pelicans in order to be able to refute statements of certain persons who were advocating the destruction of the birds as a measure of conservation to save food fishes. The results of this study are published in The American Review of Reviews for May, 1919.

Philip Laurent, of Philadelphia, spent the month of March of the years 1886, 1887, and 1904 at Gulf Hammock, Levy County. In The Ornithologist and Oölogist (1887, p. 157) he published a list of 75 species of birds seen during the first two visits, and in Bird-Lore (1906, p. 67), a list of 26 species observed in 1904.

In the spring of 1886, Barton W. Evermann, now director of the Museum of the California Academy of Sciences, spent several weeks (March 18 to April 13) in the Gulf of Mexico, collecting fishes for Dr. David Starr Jordan. He cruised from Pensacola to St. Joseph Point, taking notes of the bird life, and at the completion of the trip he published in The Ornithologist and Oölogist (1886, p. 81) a list of the birds observed, numbering 93 species.

Frank M. Chapman, now curator of birds in the American Museum of Natural History, spent the winter of 1886–87 (November 27–May 27) at Gainesville, and the following year he published in The Auk a list of 149 species of birds observed there, with brief annotations. In January, 1889, he again collected at Gainesville, and in March and April of that year went to Oak Lodge, on the peninsula opposite Micco. From that point he made a journey to the headwaters of the Sebastian River in search of Carolina Paroquets, where he found about 50 of these fast-disappearing birds and collected 15 specimens during the week's hunt. In the Proceedings of the Linnaean Society of New York for 1890, he published the results of his observation of these birds. His trip on the Suwannee River in 1890 in company with William Brewster has already been described.

Doctor Chapman visited Pelican Island in 1898, 1900, 1904, 1905, 1908, and 1914, obtaining an interesting series of photographs of the Pelicans in their natural haunts. His Bird Studies with a Camera (1900) contains a chapter on the bird life on Pelican Island, and this furnished the chief inspiration of the American Ornithologists' Union's committee on bird protection to obtain protection for Pelicans and other species of non-game birds in the State law of 1901, and likewise was the means of starting the movement which resulted in 1904 in making Pelican Island a Federal bird reservation. A chapter in his Camps and Cruises of an Ornithologist is devoted to a full account of his observations on Pelican Island, and other chapters describe his excursions in other parts of southern Florida, where he continued his studies, with the aid of the camera, of the various members of the heron tribe. In March, 1898, he collected a series of 17 skins of the Dusky Seaside Sparrow on Merritt Island.

In the spring of 1904, Doctor Chapman made a tour of observation in southern Florida, descending the Kissimmee River to Lake Okeechobee, and going thence by wagon to Sebastian. He camped for a week near the north shore of Okeechobee Lake and while there observed 12 Carolina Paroquets, the last, so far as known, ever seen in life by a naturalist. Accompanied by A. C. Bent and Louis Fuertes, Doctor Chapman, in the spring of 1908, visited some of the Florida Keys and the famous Cuthbert Rookery, near the southern coast of Florida.

Henry Nehrling, ornithologist, then connected with the Milwaukee Public Museum, was in Florida as early as 1886, and by 1893 (or perhaps earlier) he had acquired an orange grove and ornamental plantation at Gotha where, about 1902, he took up his permanent residence. In 1924, or thereabouts, he moved to Naples-on-the-Gulf. His best known work is a two-volume book, Our Birds of Song and Beauty, the first part of

which appeared in 1889. Volume one was completed in 1893 and volume two in 1896. Casual references in the work indicate that the author traveled rather widely in Florida, since he mentions being at Pensacola, Chattahoochee, Tallahassee, Monticello, Jacksonville, Suwannee River, and Lake Apopka. The book contains many references to birds seen in Florida, with notes on their habits. In The Warbler for 1904 and 1906, Nehrling published two articles on birds observed in his garden, treating the habits and food preferences of about 16 species.

Thomas H. Jackson, oölogist, of West Chester, Pennsylvania, was in Florida in March, 1887, and in a brief article in The Ornithologist and Oölogist for September of that year he related some of his experiences in the country between Enterprise and Titusville.

August Koch, taxidermist, of Williamsport, Pennsylvania, went to Florida in January, 1877, with C. J. Maynard, doing a little collecting on the St. Johns River near Jacksonville. His next visit was in March and April, 1887, to the Apalachicola River region, where he saw the Ivory-billed Woodpecker and found Paroquets numerous, collecting a number of specimens. The account of his experiences appeared in Mittheilungen des Ornithologischen Vereines in Wien (January and February, 1888). In Forest and Stream, September 24, 1891, he described the habits of the Carolina Paroquet as observed on this trip. In 1891 Koch took specimens of the Dusky Seaside Sparrow at Indianola, and thus extended the known range of this bird of limited distribution.

Charles J. Pennock, of Kennett Square, Pennsylvania, later state ornithologist of Delaware, first visited Florida in December, 1887, collecting two birds at St. Marks. Late in March, 1889, he went again to the same region, camping for about 10 days near Shepherd's Spring in the vicinity of Goose Creek, Wakulla County. While there he found a nest of the Short-tailed Hawk, and some weeks later his guide took one egg from it, together with the adult bird. This was the first egg of the species taken in North America and this discovery materially extended the known range of the bird northward. Mr. Pennock resided in St. Marks from May, 1913, until December, 1919, and while there collected birds assiduously and kept careful records of all birds observed. He published several papers under the name of "John Williams" in The Wilson Bulletin and in The Auk, the most extended being an annotated list of 239 species recorded by him in Wakulla County. In the spring of 1920 (February to April) he was located at Tallahassee, from which point he made frequent excursions into Wakulla County.

A part of each winter from 1921 to 1930 (January to April) was spent at Punta Gorda and vicinity. In March, 1922, he made a journey of four weeks in a small boat to Cape Sable, camping along the way and exploring among the Ten Thousand Islands. He spent ten days, in March, 1924, in the big marshes of the upper St. Johns River, between Malabar and Deer Park, and in 1926 and 1927 made four trips to Lake Okeechobee. He collected near Punta Gorda a large series of Burrowing Owls and made a study of their characters. He also obtained a large series of skins of the resident Clapper Rail of the Gulf coast and a specimen of Sprague's Pipit. His careful notes, which he has kindly placed at my disposal, have been of great assistance in working out the ranges of certain species.

George W. Field, later connected with the United States Biological Survey, in charge

of reservations, spent the first half of 1888 in Florida, collecting for Brown University and the United States National Museum. He made headquarters at Mrs. F. E. B. Latham's famous hostelry at Oak Lodge, on the peninsula opposite Micco, where he met Frank Chapman and Prof. J. W. P. Jenks. Doctor Field explored the region at the head of the Sebastian River, where at that time Everglade and Swallow-tailed Kites, Wood Ibises, and Carolina Paroquets were numerous. Later he made a journey by ox-team to the Halpatiokee Flats and Palm Beach.

Walter John Hoxie, naturalist, at that time residing on St. Helena Island, South Carolina, went to Florida in 1888, and collected there from August 2 to November 7 in the interests of Dr. C. Hart Merriam. He worked at Titusville, Cape Canaveral, Melbourne, Eau Gallie, St. Lucie, Fort Drum, and on the Kissimmee Prairie and Taylor Creek, near Lake Okeechobee. The Roseate Spoonbill was at that time fairly numerous on the Indian River, and the Carolina Paroquet was common on Taylor Creek, and of frequent occurrence at Fort Drum. Twelve specimens of the latter bird were obtained. At Cape Canaveral, on August 29, Hoxie shot a Caribbean Bridled Tern, this constituting the second record for the State and the only one from a definitely known locality. This specimen is now in the British Museum and is recorded in its published catalogue (vol. 25, p. 106). After completing his engagement with Doctor Merriam, Hoxie traveled on foot across the State from Fort Lauderdale to Sam Jones Old Town and to Estero—a 15 months' trip—living much of the time with the Seminole Indians. In The Ornithologist and Oölogist for 1889 and 1890 he published a number of interesting accounts of his experiences, treating of the Carolina Paroquet, the Burrowing Owl, and the Florida Jay.

Frank C. Baker, now curator of the natural history museum, University of Illinois, collected birds in Brevard County between January 5 and April 15, 1889, and examined the stomach contents of a considerable number; the results of his examination of 52 species were published in The Ornithologist and Oölogist for September, 1889.

Willis S. Blatchley, geologist and entomologist, of Indiana, spent six weeks in the spring of 1899 at Ormond and while there made notes on the birds of the region, which later were published in a book entitled "A Nature Wooing" (1902). His most important discovery was the finding of a wing bone of the Great Auk in a prehistoric shell heap, the first account of which was published by Hay in The Auk (1902, p. 255). In 1913 he purchased a small tract of land at Dunedin, on the shore of Clearwater Harbor, and two years later built a house on the property, which he has occupied during a portion of each winter since that date. From a lookout in a leaning oak he made extended notes on birds observed during a period of 17 years, and these were published in his book entitled "My Nature Nook" (1931).

In 1890, from April 19 to May 9, Harry K. Jamison, of Philadelphia, collected birds' eggs on the Gulf coast from Little Sarasota Bay to the Ten Thousand Islands. Among other species of herons, he found the Reddish Egret breeding there in small numbers.

Robert Morris Gibbs, writer on the birds of Michigan, visited the Pelican Island rookery on February 17, 1891, which he estimated to contain at that time from 4,000 to 10,000 breeding Pelicans. Several articles by him describing the colony appeared in The Oölogist, The Osprey, and Forest and Stream. He was accompanied by G. Sirrom, who collected a number of specimens of the birds and their eggs and wrote a description

of the rookery in The Ornithologist and Oölogist for May, 1893. In the spring of 1894, Doctor Gibbs visited Palm Beach, Micco, Sanford, Kissimmee, Tampa, Cedar Keys, and Jacksonville. He was particularly interested in the migrations of birds, and in The Oölogist for June, 1894, he published a few notes on the appearance of Chimney Swifts at various points in Florida.

Samuel N. Rhoads, ornithologist and mammalogist, of Philadelphia, visited Florida in April, 1891, and while there made a study of the breeding habits of the Burrowing Owl, which he found abundant at Nicodemus Slough, near Lake Hicpochee. In The Auk for January, 1892, appeared a complete account of his observations.

Arthur T. Wayne, author of Birds of South Carolina, was collecting birds on the Suwannee River in the vicinity of Branford from March to August, 1892, and at Old Town, in November, 1892, and from February to May, 1893. He published a brief report on his observations in The Auk, listing 44 species, with some life history notes. He took a large series of Bachman's Warbler, and found Swainson's Warbler breeding abundantly—the first breeding record of that species for Florida. He obtained 13 specimens of the Ivory-billed Woodpecker and saw about 10 others. In 1893, also, he collected a number of Carolina Paroquets near Kissimmee. From February 9 to June 15, 1894, he was working in the vicinity of Waukeenah, Jefferson County, and on the Wacissa and Aucilla Rivers. His report of the expedition, which appeared in The Auk for October, 1895, consists of a nominal list of 161 species, with life history notes on a few. His most important observation was of an invasion of Everglade Kites in May, when he obtained about 20 specimens, these constituting the most northerly record for the bird.

The appearance in 1892 and 1896 of the two volumes of Bendire's Life Histories of North American Birds added materially to the knowledge of Florida birds, particularly as to their nesting habits. Most of the information from Florida in this work was furnished by Dr. W. L. Ralph, well-known oölogist and later successor to Major Bendire as honorary curator of oölogy in the United States National Museum, and by Capt. J. F. Menge, a resident of Fort Myers interested in bird life.

Robert W. Williams, now on the staff of the Biological Survey, who had resided in Tallahassee since 1882, began to study the birds about his home in 1893. In 1895 he sent short notes to The Nidiologist and later to The Osprey and The Auk. In March, 1901, he took a specimen of the Vermilion Flycatcher near his home, the only record of the bird in the eastern United States. In 1904 he published in The Auk a list of the birds of Leon County, numbering 156 species, supplementing this by several later additions in the same periodical, and in 1919 he presented a list of the winter birds of East Goose Creek, Wakulla County, numbering 90 species.

In the spring of 1893 (March 1 to April 15) Ned Hollister, later director of the National Zoölogical Park, collected in the vicinity of Starke, Bradford County, obtaining 31 birds and a number of sets of eggs. He compiled a list of 46 species that he had observed, and published a short article on the trip in The Oölogist for June, 1893.

L. W. Brownell, oölogist, spent the spring of 1894 at Enterprise, and on April 17 he visited Pelican Island, where he collected a series of Pelicans' eggs. In a short article in The Osprey for January, 1899, he narrates his observations at the rookery and mentions also having visited numerous other rookeries in Florida, including those at Cape Sable.

Col. Wirt Robinson, naturalist and collector, in May, 1894, took about 100 bird skins on Anastasia Island and in the Matanzas River near the Inlet. These are now in the United States National Museum.

Bradford Torrey, well-known nature writer, made two trips to Florida, the first about 1894, the second nine years later. On the first, described in A Florida Sketch Book, he visited St. Augustine, Daytona Beach, New Smyrna, Sanford, and Tallahassee; the second took him to Ormond and Miami, with "a peep at the Everglades" at the head of the Miami River. Ten chapters in his Nature's Invitation are devoted to his experiences on this journey. Both books are full of bird lore, told in Torrey's inimitable style.

Outram Bangs, now curator of birds in the Museum of Comparative Zoölogy, collected at Oak Lodge, on the peninsula opposite Micco, in the winter and spring of 1895 (January 30 to March 9). From February 4 to April 6 of the following year he worked on the Matanzas River and Anastasia Island, and at Eau Gallie and Gainesville. Although devoting most of his time to mammals, he collected some birds and described as new a number of subspecies believed to be peculiar to the peninsula, viz.: the Florida forms of the Kingbird, Brown-headed Nuthatch, Tufted Titmouse, Carolina Chickadee, Bluebird, Meadowlark, and Red-tailed Hawk, and the Red-shouldered Hawk of the Keys.

In the spring of 1895, Robert Ridgway, then curator of birds in the United States National Museum, Edward J. Brown, and William Palmer, also of the National Museum, joined forces for a month's sojourn (February 25 to March 24) on the Kissimmee River, at Orange Hammock, a few miles above Fort Kissimmee. Palmer recorded their observations in The Osprey for 1901, listing 113 species. He had previously published in The Auk for April, 1896, his studies of the Burrowing Owl. In Harry Harris's biography of Ridgway (1928), some of the interesting experiences on this trip are related by Mr. Ridgway himself. Following his stay at Orange Hammock, Mr. Brown went by himself in search of Paroquets and was successful in obtaining four near the village of Campbell. In March of the following year he returned to the same place and collected 38 skins and two living birds.

In February and March, 1896, Ridgway went again to Florida, accompanied by his son Audubon. They worked at Fort Bassenger, on the Kissimmee Prairie, on Taylor Creek, near Lake Okeechobee, and at Chandler's Hammock, near the northwestern edge of the Everglades. Their collections numbered about 130 birds, including a series of 15 Paroquets taken on Taylor Creek. From January 16 to March 5 of the following year, Ridgway extended his Florida researches farther south, going to Fort Myers and up the Caloosahatchee River to Lake Flirt, thence across country to Lake Trafford, and into the Big Cypress south of Immokalee. On this journey he collected 165 birds and was successful in finding two pairs of Ivory-billed Woodpeckers—the special object of his search. In The Osprey for November, 1898, he related some of his experiences while hunting these rare birds.

Edward J. Brown, following his two trips already mentioned, located at Lemon City in 1897, living there until 1908. During this period he collected a few birds for the United States National Museum and published a brief paper in The Auk recording a few observations. Later he resided at Eustis and Coconut Grove, and continued to send notes on birds to the National Museum.

Joseph C. Ingersoll, in the winter of 1895–96, at Lake Harney, Mullet Lake, and Sebastian, obtained 140 specimens of birds, which were purchased by the United States National Museum.

Willis W. Worthington, bird collector, of Shelter Island, New York, has made 11 trips to Florida and probably has collected more birds in the State than any other person, having taken more than 7,000. His first visit was in 1897, from January 19 to March 5, at which time he sailed up the St. Johns River in a catboat as far as Puzzle Lake, above Lake Harney. In the winter of 1902–3, from November 15 to May 14, he worked in western Florida in the interests of the Carnegie Museum, with headquarters at Whitfield, on Choctawhatchee Bay, during which time he collected 1,364 birds. He was joined by W. E. Clyde Todd from March 21 to May 6, and they published the results of their studies in The Wilson Bulletin for December, 1926, listing 160 species observed. During the following winter (December 17, 1904, to May 23, 1905) Worthington sailed in a gasoline launch from Charleston, South Carolina, to Fernandina, Florida, thence to the St. Johns River, and up that stream as far as Persimmon Hammock (about west of Titusville). On November 15, 1905, he established headquarters on Amelia Island and lived there for 14 months, collecting during that period more than 2,300 birds. On January 21, 1907, he sailed into the St. Johns River in his power boat *Ornis*, went up the river to Sanford, and from there shipped the boat by railroad to Kissimmee. There he launched it on Lake Tohopekaliga, and went down the Kissimmee River into Lake Okeechobee, across the lake, and down the Caloosahatchee River to Alva, where he arrived April 17. He remained at Bassenger Landing from February 23 to April 8, making side trips on the Kissimmee Prairie and to Taylor Creek, near Lake Okeechobee, in search of Carolina Paroquets. He failed to find any, however, the last having been killed, apparently, some time between April, 1904, when Chapman saw 12 birds on this creek, and the date of Worthington's visit (March, 1907).

From January 1 to May 13, 1910, Worthington worked at Eau Gallie and Merritt Island; from December 14, 1913, to April 28, 1914, he was at Eau Gallie and on the Indian River; and from May 8 to September 2, 1914; January 20 to May 9, 1916; and December 24, 1917, to May 15, 1918, at Amelia Island. In the winter of 1919–20 (November 21 to February 5) he was collecting on the St. Johns River as far up as Welaka; in the winter of 1920–21 (November 29 to April 23) at Wilson, on Merritt Island; and in the winter of 1922–23 at Miami Beach (November 27 to January 26) and Wilson (February 3 to April 16).

The great majority of Worthington's birds were of the commoner species and they have been distributed among various large American collections, chiefly those of the Carnegie Museum, the Dwight Collection in the American Museum of Natural History, and the collection of Dr. Louis B. Bishop. The stomachs of most of the birds taken were sent to the Biological Survey, and the migration records kept by Worthington are in the files of that bureau.

Two trips to Florida made in 1897 by individuals resulted in minor contributions to our knowledge of Florida birds. George K. Cherrie, then associated with the Field Museum, Chicago, visited Santa Rosa Island, February 23 to April 2, 1897, and took 19 specimens of the Cuban Snowy Plover. Hugh L. Willoughby crossed the Everglades

from the head of Harney River to Miami in a canoe; in his account of this journey (1898) he gives casual notes on a few birds seen—Limpkin, Everglade Kite, egrets, and herons.

Louis Agassiz Fuertes, late famous bird artist, visited Florida in the spring of 1898, in company with Charles R. Knight and Abbott and Gerald Thayer. Some of their experiences in the marshes near the headwaters of the St. Johns River are interestingly described by Alden H. Hadley in an article in American Forests for February, 1931.

Dr. Edgar A. Mearns, an associate of the United States National Museum, collected in southern Florida from March 17 to May 11, 1901, on the Kissimmee Prairie and at Blue Cypress Lake; during this period he obtained 236 bird skins, which he presented to the United States National Museum. At Padgett Creek, Brevard County, on April 18, he took 5 Carolina Paroquets, these being among the last specimens of this species to be collected. Other rarities obtained on this trip were a pair of White-tailed Kites and several specimens of the Florida Grasshopper Sparrow, a new subspecies described by him on his return.

Reginald Heber Howe, Jr., naturalist, of Quincy, Mass., accompanied by Le Roy King, was in Florida from February 23 to April 2, 1902, visiting St. Augustine, Enterprise, Sanford, Kissimmee, Lake Okeechobee, Fort Myers, Titusville, Miami, the Florida Keys, and Flamingo. In a paper published in Contributions to North American Ornithology (1902, pp. 25–32), he presented notes on 22 species of birds observed on the trip, with original descriptions of the Florida races of the Sparrow Hawk and the Crested Flycatcher. Near Flamingo, on March 26, 1902, he was fortunate in finding a flock of 500 to 1,000 Flamingoes, apparently the last appearance of this bird in such numbers in Florida. In 1903 he began publication of a list of the birds of Florida, of which only three parts, covering 17 species, were issued.

Arthur Cleveland Bent, a collaborator of the United States National Museum and author of Life Histories of North American Birds, visited Florida in April and May, 1902, working at various points along the Indian River, from Titusville to Sebastian, and in the marshes of the upper St. Johns River. The following year, at the same season, he cruised in the waters at the southern end of the peninsula, from Miami to Cape Sable, making trips to Cuthbert Lake, Alligator Lake, and other points on the southern coast. His special object was to observe the breeding habits of the herons, egrets, and ibises, and the results of his studies appeared in The Auk for January and April, 1904. In March and April, 1908, he went again to the Cape Sable region and the Florida Keys, in company with Frank M. Chapman and Louis A. Fuertes. Their experiences in the Cuthbert Rookery are described by Doctor Chapman in Camps and Cruises of an Ornithologist, and other details of their observations are mentioned by Bent in his North American Marsh Birds. Mr. Bent spent the winter of 1924–25 on the Gulf coast in the vicinity of Tampa Bay; in the spring of 1930, with the coöperation of John B. Semple, of Coconut Grove, he collected a series of skins of the Florida Red-tailed Hawk in Glades County.

Herbert K. Job, author, photographer, and lecturer on birds, visited Pelican Island in April, 1902, and took a series of photographs of the nesting Pelicans. The next spring, in April and May, he accompanied A. C. Bent on an extended cruise among the Florida Keys, and visited the principal bird rookeries on the mainland near Cape Sable—those at Bear Lake, Cuthbert Lake, and Alligator Lake. He spent four days on Bird Key,

in the Tortugas, obtaining a series of remarkably fine photographs. These journeys are charmingly described in detail in his book, Wild Wings, issued in 1905. In company with Dr. Herbert R. Mills, in the spring of 1915, Mr. Job made explorations along the Gulf coast to obtain motion pictures of bird life for the National Association of Audubon Societies. Starting from Tampa, the party visited most of the egret rookeries along the coast to Cape Sable, and then went to Key West and the Tortugas. A brief account of the trip appeared in Bird-Lore (1915, p. 507).

During the winters of 1902–3 (January–April) and 1903–4 (December 10–April), Arthur H. Helme, ornithologist, of Millers Place, New York, who was then located in southeastern Georgia, made several brief collecting trips to Nassau County, Florida. In the winter of 1905–6 and the three succeeding winters, he made headquarters at Cedar Keys, and during the first three of these seasons, in March and April, he cruised up the coast as far as the Aucilla River, collecting in the big swamps bordering the Fenholloway, Aucilla, and Wacissa Rivers. In the spring of 1908 (February 17 to March 27) he cruised southward from Cedar Keys to Key West and other Florida Keys, stopping in numerous bays along the route. During these six years, Helme collected about 1,250 bird skins, which are now deposited in the Brooklyn (New York) Museum, under his care.

Two papers published in 1903 added to our knowledge of Florida bird life. In Bird-Lore (1903, p. 77), Dr. Joseph Thompson had a paper on the Tortugas tern colony, giving a detailed account of the life history of the terns breeding there, with some excellent photographs of birds and nests; and Rev. J. M. Keck, located at Fruitland Park from December 29, 1902, to April 20, 1903, published his observations on the birds of the region in The Wilson Bulletin (June, 1903), listing 91 species.

In June, 1904, Henry W. Fowler, ichthyologist, of the Academy of Natural Sciences of Philadelphia, cruised among the Florida Keys, between Cape Sable and Marquesas Keys, in search of land snails. He kept notes on the birds observed and in The Auk for October, 1906, published an annotated list of 33 species.

J. J. Ryman, who lived at Palm Beach for a number of years (1904–1918), made a considerable collection of birds' eggs and mounted birds, now in the Florida State Museum. He was particularly interested in the larger birds, such as the Bald Eagle, Everglade Kite, and Swallow-tailed Kite.

During the period from January 9 to April 1, 1906, Mrs. Lucas Brodhead lived on Upper Matecumbe Key, and in Bird-Lore for October, 1910, she gave a brief account of the birds seen there. She spent 16 days in March, 1909, at Miami and recorded 50 species of birds observed in that period.

Prof. John B. Watson, psychologist, of New York City, lived on the Tortugas from May 2 to July 18, 1907, and carried on a study of the behavior of the Noddy and Sooty Terns, including experiments on the homing instinct of these birds, which showed a surprising ability to return to their nests from far distant points. Marked birds carried to Key West, Havana, Galveston, and Cape Hatteras, and there liberated found their way back to their nests on Bird Key in from one to five days. He continued his investigations in 1910 (May 2 to June 21) and in 1913, in the latter year having Dr. K. S. Lashley associated with him. The results of these studies were published in Papers from the Department of Marine Biology of the Carnegie Institution of Washington, under the auspices of

which organization the work was carried on. Condensed accounts of the experiments appeared also in Bird-Lore, December, 1907; Harper's Magazine, October, 1909; and Science, October 7, 1910.

Donald J. Nicholson has lived in Orange County, Florida, all his life, and has been interested in birds from a very early age. In 1908, at the age of 16, he traveled down the Kissimmee River in company with Gilbert R. Rossignol, Jr., of Savannah, mainly in search of birds' eggs. The following year another visit to the Kissimmee Valley was made, also with Rossignol, and in January, 1910, Nicholson started off by himself in a 22-foot rowboat from Lake Kissimmee. After about a month's work in that region he proceeded early in March down the river to Istokpoga Lake, where he remained until April 17, camping near the mouth of Istokpoga Creek. Here among other things he found three nests of the rare Short-tailed Hawk, one with young birds, one with two eggs, and one ready for eggs.

Nicholson went to the Kissimmee Prairie several times in 1920, in company with Fred W. Walker, a region which he has visited every season since then. In 1925 he made two journeys to the St. Johns River marshes west of Fellsmere, and collected eggs of the Everglade Kite and Limpkin. In 1926, he joined forces with William Leon Dawson, who had projected a work on Florida birds, in making explorations on the Kissimmee Prairie and on Merritt Island. In July of that year, on Merritt Island, Nicholson collected four sets of eggs of the Black Rail, the first to be found in Florida. In company with Dawson, he went to Cape Sable in 1927, and there found three nests of the rare Cape Sable Seaside Sparrow, one with 4 eggs, the others with young. In 1928 he made two visits to Collier County, in southwestern Florida, where he studied the habits of the Swallow-tailed Kite.

Mr. Nicholson's collection of eggs of Florida birds is undoubtedly the most complete one in the State, and is especially valuable for the full data preserved with the eggs. He has published a number of articles on the nesting habits of Florida birds, notably those of the Everglade Kite, Swallow-tailed Kite, Limpkin, Florida Crane, Audubon's Caracara, Black Vulture, and Black Rail.

Rubert J. Longstreet, now president of the Florida Audubon Society, began to study Florida birds about 1906. He has resided at Coronado, De Land, and Daytona Beach, and has written many short articles for ornithological magazines. In The Florida Naturalist for April, 1928, he published a list of the more common Florida birds, numbering 174 species, annotated to indicate the manner of occurrence and, in some cases, the habitat. Among the rarities recorded by him at Daytona Beach are a Blue Goose, a Mountain Plover, several specimens of Audubon's Shearwater, and a Noddy Tern. In 1930 he issued a manual for the use of beginners in bird study, entitled "Bird Study in Florida"; this contains brief descriptions and notes on habits of most of the birds of the State, with a field key to the common birds, a nominal list of 241 species, and an annotated list of 203 species recorded from the region around Daytona Beach.

G. Clyde Fisher, of the American Museum of Natural History, spent a week in December, 1909, on Lake Wimico, near Apalachicola, and later published in The Wilson Bulletin (1910b, p. 41) a brief account of the trip, with a list of 49 species of birds observed.

In 1909 and 1910, Commander F. M. Bennett, of the United States Navy, was cruising along the coasts of Florida, inspecting lighthouses. At Key West, April 14, 1909, and at the Tortugas, six days later, he observed an unusually large flight of migrating birds that had been delayed and in part destroyed by a violent thunderstorm. An article by him relating this experience appeared in Bird-Lore for June, 1909. The following year he published a brief paper in the same periodical, in which he tells of seeing great numbers of ducks of several species at various points along the Florida coast from Pensacola to Charlotte Harbor, and in Key Biscayne Bay.

Oscar E. Baynard, oölogist, made observations on birds at Micanopy in the spring of 1909; and from March 19 to 22, 1910, he recorded 79 species seen on the Oklawaha River near Orange Springs. He was the first warden in charge of the bird reservation on Orange Lake, purchased in 1911 by the National Association of Audubon Societies. In The Oölogist for January, 1911, is a list of 21 species observed by him on Bird Island in the lake, with estimates of the numbers breeding there. While acting as warden he took many excellent photographs of the nesting birds from blinds and made careful studies of the food brought to the young. In The Wilson Bulletin for December, 1912, he presented a summary of his findings on the food of herons and ibises, and in the number for September, 1913, published a full account, illustrated by numerous photographs, of the nesting and feeding habits of the Glossy Ibis. In the spring of 1911 he spent two months camping in the Everglades bordering Lake Okeechobee, an account of which trip appeared in The Oölogist (1913c). In The Auk for April, 1913, is a list compiled by him of 98 species of breeding birds of Alachua County.

Henry Thurston, of New York, spent some time in 1910 and 1912 at Seven Oaks, on Old Tampa Bay, following which he published articles in The Warbler (1913b) on the habits of the Snowy Heron and Wilson's Plover, and in Bird-Lore (1913c) on the habits of the Gray Kingbird.

P. B. Philipp, oölogist, of New Jersey, camped on the shores of Orange Lake for eight days in May, 1911, and in Bird-Lore for December of that year he wrote an account of the birds breeding on the lake.

In March, 1912, Frank M. Phelps, oölogist, of Elyria, Ohio, accompanied by Oscar E. Baynard, went by boat up the Caloosahatchee River, from Fort Myers to Lake Okeechobee. In The Wilson Bulletin for September, 1912, he described their experiences and listed 93 species of birds observed. During March and April of the following year, he again collected in southern Florida, visiting the Big Cypress Swamp and the Okaloacoochee Slough in northern Collier County. In The Wilson Bulletin, June, 1914, he published an account of his observations, listing 65 species. At the big Corkscrew Rookery he found the Wood Ibis nesting in enormous numbers, and in much smaller numbers the American Egret and Roseate Spoonbill.

Paul Bartsch, curator of mollusks in the United States National Museum, has visited the Florida Keys almost every year from 1913 to the present, engaged upon studies and experiments with Bahaman mollusks, and during this period he has made careful notes on the birds observed and has collected many specimens. Articles detailing the results of his observations appeared in the Year Book of the Carnegie Institution of Washington for the vears 1913 to 1919, and all of his field notes have been available to the writer in

the preparation of this work. In the Smithsonian Report for 1917 (1919) Doctor Bartsch published an extended paper on The Bird Rookeries of the Tortugas, illustrated with numerous photographs of the bird colonies found there. The terns and the Man-o'-war-bird are treated at length, and a list of 128 species known from the islands is added.

Frederic H. Kennard, ornithologist, of Newton Center, Massachusetts, explored the Big Cypress Swamp and the Okaloacoochee Slough in 1914 (February 14 to March 27), traveling in an oxcart from Fort Myers to Deep Lake, and on a gasoline railcar to Everglade. His main object was to observe and collect Ivory-billed Woodpeckers, but only one of these birds was found. In two papers in The Auk for 1915, he relates his experiences and gives important notes on the habits and distribution of the birds seen.

Ludlow Griscom, now research curator of zoölogy in the Museum of Comparative Zoölogy, has made several short trips to western Florida, chiefly to points in Leon County and to Goose Creek on the coast of Wakulla County. On December 29, 1915, at the latter place, he recorded 95 species of birds. This list, with other short notes from Leon County, has been published in Bird-Lore and The Auk. In 1920, in collaboration with John T. Nichols, he described a dark race of the Seaside Sparrow (*Ammospiza m. juncicola*), the type of which had been obtained at Goose Creek.

Mrs. Hiram Byrd, who lived in various parts of Florida from 1886 until her death in 1926, began to study birds in Florida about 1915; she contributed many notes on migration to the Biological Survey, and as chairman of the Committee on Conservation of the Florida Federation of Women's Clubs and Secretary of the Florida Audubon Society, she exerted an important influence on protection of bird life in the State.

Francis M. Weston took up his residence at Pensacola in February, 1916, and at once began to make detailed notes on the birds of the region. He published two short papers in the Bulletin of the Charleston Museum in 1916–17, and in August, 1924, he began to send bi-monthly reports to Bird-Lore, which were published in the series on The Season. For several years Mr. Weston has been coöperating with the Biological Survey by collecting needed specimens and by watching for rare or unusual birds. In April, 1928, he took the first specimen of Baird's Sandpiper recorded from the State. In The Florida Naturalist for that year appears a historical account by him of the ornithology of the region west of the Apalachicola River.

Theodore Roosevelt, ex-president, spent about a week during the spring of 1917 in the vicinity of Captiva Island, hunting devilfish. In an article in Scribner's Magazine, September, 1917, describing his experiences, he included notes on pelicans, ibises, herons, and other water birds seen.

In March and April, 1917, John Treadwell Nichols, associate curator of fishes in the American Museum of Natural History, cruised around the southern end of Florida from Miami to Long Key, Cape Sable, and to Sanibel Island on the west coast. His report on the birds observed, filed with the Biological Survey, lists 85 species. Many migrating shore birds were noted on the beaches of the west coast and a considerable number of migrant land birds on Sandy Key, April 16. In the Proceedings of the Linnaean Society of New York for 1918 he presented notes on about 40 species of birds seen on the cruise.

Seymour R. Ingersoll spent the winter of 1917–18 at New Smyrna and at the close of the season he sent to the Biological Survey a manuscript report of the birds observed,

numbering 149 species. Later he took up his residence at New Smyrna and from 1922 to the present year has been reporting annually on bird migrations in that vicinity. His records, some of which have been published in The Florida Naturalist, have been used in the preparation of this work.

Clifford H. Pangburn, of Chappaqua, New York, was in Pinellas County from January 22 to April 29, 1918, and in The Auk for 1919 is a report by him on 135 species of birds observed during that period.

Winthrop Sprague Brooks, in the spring of 1920, collected specimens among the Florida Keys, obtaining among other birds a new form of the Clapper Rail on Big Pine Key, which he described (1920, p. 53) as *Rallus longirostris insularum*.

Harold H. Bailey, who has resided in Miami since 1921, has written a number of short papers on Florida birds, which have appeared chiefly in The Wilson Bulletin and The Oölogist. In 1925 he published a book on The Birds of Florida, treating 425 species and subspecies, illustrated with colored plates of nearly every species, from drawings by George Miksch Sutton.

Allan Brooks, nature artist, of Okanagan Landing, British Columbia, visited Florida in January, 1921, and succeeded in adding a bird to the Florida list—the Kittiwake Gull, a specimen of which he shot at Jupiter, January 24, 1921.

William G. Fargo, of Jackson, Michigan, has spent a part of every winter since 1923 at Pass-a-Grille and in the Tampa Bay region, making frequent excursions into the country lying north of Tampa Bay, thus covering a part of the territory worked by W. E. D. Scott between 1879 and 1890. The Wilson Bulletin for September, 1926, contains an annotated list, compiled by Mr. Fargo, of 184 species of birds of Pinellas and Pasco Counties. In 1928, he dug up the bones of a Goshawk that had been buried near St. Petersburg, and thus established the most southerly record for this hawk.

From January 12 to February 6, 1924, Ernest G. Holt, field naturalist, then connected with the Cleveland Museum, studied birds in southern Florida, from Royal Palm Hammock to Cape Sable and the near-by Keys. Later in the same season (March 11 to April 4) George Miksch Sutton worked over some of the same territory and northward to Miami and the Everglades along the Tamiami Trail. A paper under the joint authorship of Holt and Sutton, issued in April, 1926, describes the results of the two expeditions, listing 123 species of birds and containing copious field notes on many of them. The paper includes also an excellent colored drawing of the Cape Sable Seaside Sparrow by Sutton. Holt continued his observations and collections on the Kissimmee Prairie during February and March, and later in the region around Micanopy. In 1928, he published a paper on The Status of the Great White Heron and Würdemann's Heron, embodying the results of his studies of these birds on their breeding grounds in Florida Bay.

From March, 1924, to September, 1930, Herbert L. Stoddard, residing on a plantation 4 miles southwest of Beachton, Georgia, and within about half a mile of the Florida line, conducted a detailed study of the habits of the Bob-white for the Biological Survey in coöperation with a committee of sportsmen representing The Quail Study Fund. His work took him frequently into adjacent parts of Florida, as far as the coast of Wakulla County, where he made many notes on birds and collected a number of important specimens. Two preliminary reports on the progress of the Quail investigations were

issued in 1925 and 1926, and the final report appeared in May, 1931, under the title "The Bobwhite Quail: Its Habits, Preservation, and Increase."

Arthur A. Allen, professor of ornithology in Cornell University, spent about three months in the spring of 1924 in Florida; with headquarters at St. Cloud, he explored the St. Johns River marshes and the Jane Green Swamp, near Deer Park. On Taylor Creek, northern Osceola County, he found two pairs of breeding Ivory-billed Woodpeckers, and was fortunate in getting photographs of one bird in life.

Edward J. Court and Louis Weber, in March and April, 1925, explored the coast of southern Florida from Naples to Cape Sable, and collected birds' skins and eggs. At the Cape, Mr. Court found a nest of the Short-tailed Hawk, and a set of five eggs of the Cape Sable Seaside Sparrow. His notes on the birds seen have been used in preparing the present report.

Bayard H. Christy studied the bird life of southern Florida in February and March, 1927, visiting Coconut Grove, Cape Sable, Lake Okeechobee, the Everglades, Immokalee, and the Big Cypress. In The Auk (1928, p. 283) he wrote a charming and accurate description of the region, with notes on some 40 species of birds seen on the trip. In a later paper (1928, p. 423), he described a visit to the Alligator Lake rookery, near Cape Sable, and estimated the numbers of birds nesting there at 879 pairs of 10 species.

Elon Howard Eaton, author of The Birds of New York, and James Savage, of Buffalo, during February, 1930, traveled through Florida by automobile, noting every bird seen. They visited nearly every section of the peninsula, from Fernandina to the upper Keys, crossed the Everglades on the Tamiami Trail, and explored the Ten Thousand Islands, the Tampa region, and the Kissimmee Prairie. Their list of birds observed numbers 190 species and includes such rarities as a Glaucous Gull and a Snow Goose.

INVESTIGATIONS BY THE BIOLOGICAL SURVEY

The earliest work done by the Survey in Florida was concerned chiefly with studies of mammalian life. Morris M. Green, now of Ardmore, Pennsylvania, while in the employ of the Survey, in April and May, 1889, collected a few birds at Titusville, Cape Canaveral, Eden (St. Lucie County), and Lake Worth. John Alden Loring, in the spring of 1895, collected mainly mammals, but obtained 28 specimens of birds at Oak Lodge (opposite Micco), Palm Beach, Miami, Key Largo, Key West, and Everglade.

Waldo L. McAtee visited St. Vincent Island twice in 1910 (January 7 to 15; October 27 to 29). He devoted himself to a study of wintering waterfowl and the collection of their stomachs.

In January and February, 1917, Francis Harper traveled through eastern Florida as far south as Okeechobee Lake, noting particularly the waterfowl conditions. He visited the principal ducking grounds along the east coast, from Amelia Island to Pelican Island, near Sebastian; he went up the St. Johns River to Lake Harney, and down the Kissimmee River to Lake Okeechobee. Later he worked on Lake Apopka, Lake Harris, Lake Griffin, and Orange Lake, and went by launch from Silver Springs to Palatka, via the Silver, Oklawaha, and St. Johns Rivers. His manuscript report contains detailed notes on waterfowl conditions, as well as on heron and egret rookeries and bird life in general, and has been drawn upon for the present work.

Alexander Wetmore, then on the staff of the Biological Survey, now assistant secretary of the Smithsonian Institution, was in Florida from January 16 to March 6, 1919, chiefly to obtain data on the economic status of the Brown Pelican. He made observations and collected specimens at St. Petersburg, Bradenton, Pass-a-Grille, Sarasota Bay, Punta Gorda, New Smyrna, Sebastian, Fort Lauderdale, Miami Beach, Royal Palm Hammock, West Lake (near Cape Sable), and Key Largo.

Harold N. Vars, in the employ of the Biological Survey, collected in 1923 on Merritt Island (March 21 to April 19) and Amelia Island (April 23 to May 12), obtaining 214 specimens of birds.

Most of the bird students who have visited Florida were there chiefly in winter or early in the spring. Of the many published papers on Florida birds, less than half a dozen contain local lists of breeding birds; and prior to 1918 no systematic survey of the bird life of the State had been undertaken. In January of that year, the present writer was commissioned by the Biological Survey to begin such a survey and, as little was known about the land birds of southern Florida, it was decided to start work there. Two trips were made in 1918 to Royal Palm Hammock, then recently set aside as a State Park, one from January 15 to February 5, the other from June 11 to 19. A report on the birds of this park, listing 128 species, appeared in The Auk for April, 1921. Other places visited that season were Cape Sable (February 8 to 19); Lake Okeechobee (February 23 to March 4); Auburndale (March 10 to 13); Jupiter (March 14 to 18); Seven Oaks, near Clearwater (June 4 to 8); Miami (June 20 to 23); and Fort Lauderdale (June 24 to 27). A cruise by motor boat along the Gulf coast from Sarasota to Homosassa (May 9 to June 3) permitted studies of the breeding birds of the marshes and of the migrating shore birds. The work at Cape Sable resulted in the discovery of a new species of Seaside Sparrow (*Ammospiza mirabilis*) inhabiting the brackish, rather dry marshes on the coast prairie, and the explorations in May and June furnished much new information on the ranges of the breeding birds. Charles H. M. Barrett accompanied me on the boat trip in May, 1918, and in June he worked independently at Braden River, Miakka Lake, and Punta Gorda. In 1920, he was with me at St. Marks and on the Aucilla River, and in St. Andrews Bay from February 4 to 18 he again conducted investigations independently.

In 1919, with Arthur H. Hardisty as assistant, I explored the southwestern coast, from Fort Myers to Chokoloskee. We then went up the Caloosahatchee River to Moore Haven and Citrus Center on the Okeechobee Prairie, across the Lee County prairies to Immokalee and the edge of the Big Cypress Swamp, and to Deep Lake, on the southern side of the swamp. In January and February, 1920, the winter birds of the northern Gulf coast were studied, from the Aucilla River westward to Apalachicola, and a brief visit was made to Cedar Keys and the Chassahowitzka River.

In company with Herbert W. Brandt, oölogist of Cleveland, Ohio, in 1923, I worked on the Kissimmee Prairie in the vicinity of Istokpoga Lake and Fort Bassenger, and in the region about Sebring. We collected also at Orlando and on the Sebastian River, and made a journey by boat through canals in the Everglades, from Palm Beach to Okeelanta and out to Fort Lauderdale. Our search for Everglade Kites in their old haunts in the Everglades and in the Loxahatchee Marsh was unsuccessful, but after Mr. Brandt's

departure I met Henry Redding, a resident hunter, who took me to the big marshes at the head of the St. Johns River, where the Kites were breeding in considerable numbers. Our most important find that season was a nest with eggs of the Short-tailed Hawk at Istokpoga Lake.

In 1925, I began the season on April 15 at Sarasota, going from there by automobile, accompanied by H. L. Ferguson, of Sarasota, through Polk and Osceola Counties, south to Illahaw, and east to the edge of the St. Johns marshes. Having received information concerning the location of some Ivory-billed Woodpeckers, I hoped to find this fast-disappearing species, but although I employed a guide who took me to the spot where Dr. Arthur Allen had seen several of the birds the previous spring, not one could be found after a prolonged search. After a short trip to the Emeralda Marsh with Edward J. Brown, where we found Limpkins abundant, I went with Donald J. Nicholson by automobile to Fellsmere. Leaving our car on the edge of the marshes west of town, we walked along the canal bank about 7 miles into the big marsh, where we studied the habits of a nesting colony of Everglade Kites and collected a few specimens.

From May 15 to 30, with B. J. Pacetti, then Federal warden, in charge of the Florida district, in the Biological Survey launch, I explored the east-coast marshes and beaches from Merritt Island northward through Mosquito Lagoon, Halifax River, and other inland waterways, to Matanzas River at the southern end of Anastasia Island. In June, visits were made to Panasoffkee Lake; Ocala and Silver Spring; Orange Lake; Gainesville; Old Town (on the Suwannee); San Mateo; Shell Bluff (on Crescent Lake); Orange Park (on the St. Johns River); Amelia Island; and to the St. Mary's River, near Boulogne. At Panasoffkee Lake, where Scott collected in 1876, I found conditions about as primitive as when he was there, but failed to discover any Everglade Kites, which he had reported numerous. This work furnished important data on the breeding ranges of many land birds.

In company with John B. Semple, of Coconut Grove, and with Wallace B. Grange as assistant, I visited Cape Sable again from March 26 to April 7, 1926. After considerable search we found a colony of the Cape Sable Seaside Sparrows several miles distant from the spot where they had been discovered in 1918, and obtained 12 specimens for the Biological Survey collection. During the rest of the season (April 14 to May 27) we cruised along the Gulf coast from Pensacola to Cedar Keys, and up the Apalachicola, St. Marks, Aucilla, and Suwannee Rivers. A popular account of this journey appeared in The Florida Naturalist for January, 1930. The scientific results included the discovery of a new race of Red-winged Blackbird and much new information on the breeding birds of that coast. During June Mr. Grange worked independently at Orange Lake and in Madison County, and in coöperation with Herbert L. Stoddard in Leon County.

In May, 1929, with W. Howard Ball as assistant, I traveled by automobile through northern and central Florida to determine as definitely as possible the ranges of the breeding birds of that region. These studies carried us from Jacksonville south to the Kissimmee Prairie, where we discovered a colony of Florida Grasshopper Sparrows and obtained a good series of specimens. We then drove west to the Gulf coast near St. Petersburg, and north along the western side of the peninsula to Cherry Lake, Madison County, on the Georgia boundary, and from there back to Jacksonville.

LIST OF BIRDS ORIGINALLY DESCRIBED FROM FLORIDA[1]

Type locality

**Puffinus auduboni* Finsch (=*Puffinus lherminieri*) . . . . . Cape Florida.
Proc. Zool. Soc. London, 1872, p. 111.

**Procellaria meridionalis* Lawrence (=*Pterodroma hasitata*). . . . . Indian River Inlet.
Ann. Lyc. Nat. Hist. New York, vol. 4, p. 475, July, 1847.

**Procellaria brevirostris* Lawrence (=*Pterodroma hasitata*) . . . . . Indian River Inlet.
Ann. Lyc. Nat. Hist. New York, vol. 4, Nos. 8, 9, April, 1847.

**Pelecanus albicollis* Maynard (=*Pelecanus occidentalis occidentalis*) . . Cedar Keys.
Amer. Sportsman, vol. 3, p. 379, March 14, 1874.

Carbo floridanus Audubon (=*Phalacrocorax auritus floridanus*) . . . Florida Keys.
Birds Amer. (folio), vol. 3, pl. 252, 1835.

Plotus leucogaster Vieillot (=*Anhinga anhinga*) . . . . . Florida.
Nouv. Dict. d'Hist. Natur., vol. 1, pp. 545–546, 1816.

Ardea occidentalis Audubon . . . . . Keys near Key West.
Birds Amer. (folio), vol. 3, pl. 281, 1835.

Ardea wardi Ridgway (=*Ardea herodias wardi*). . . . . Oyster [=Estero] Bay.
Bul. Nuttall Orn. Club, vol. 7, p. 5, January, 1882.

**Ardea würdemannii* Baird (considered a hybrid) . . . . . Florida.
Pacific R. R. Reports, vol. 9, p. 669, 1858.

**Ardea pealii* Bonaparte (=*Dicromanassa rufescens*) . . . . . Florida.
Ann. Lyc. Nat. Hist. New York, vol. 2, p. 154, 1828.

**Ardetta neoxena* Cory (=*Ixobrychus exilis*) . . . . . Caloosahatchee River, near Lake Okeechobee.
Auk, vol. 3, p. 262, April, 1886.

**Guara alba longirostris* Bailey (=*Guara alba*) . . . . . Florida.
Bailey Mus. and Libr. Nat. Hist. [Miami, Fla.], Bul. 4, April 1, 1930.

Anas obscura var. *fulvigula* Ridgway (=*Anas fulvigula fulvigula*). . . Dummitts, Indian River.
Amer. Nat., vol. 8, p. 111, February, 1874.

Vultur atratus Meyer (=*Coragyps atratus atratus*) . . . . . St. Johns River.
Zool. Annalen, vol. 1, p. 290, 1794.

Rostrhamus sociabilis var. *plumbeus* Ridgway (=*Rostrhamus sociabilis plumbeus*) . . . . . Head of Miami River.
Baird, Brewer, and Ridgway, Hist. North Amer. Birds, vol. 3, p. 209, 1874.

Buteo borealis umbrinus Bangs. . . . . Miakka.
Proc. New England Zool. Club, vol. 2, p. 68, July 31, 1901.

Buteo lineatus alleni Ridgway . . . . . Tampa.
Proc. U. S. Nat. Mus., vol. 7, p. 514, February 25, 1885.

Buteo lineatus extimus Bangs . . . . . Cape Florida.
Proc. New England Zool. Club, vol. 7, p. 35, January 16, 1920.

**Haliaeetus floridana* Bailey (=*Haliaeetus leucocephalus leucocephalus*) . Lower Florida Peninsula.
Bailey Mus. and Libr. Nat. Hist. [Miami, Fla.], Bul. 4, April 1, 1930.

Polyborus auduboni Cassin (=*Polyborus cheriway auduboni*) . . . . Florida.
Proc. Acad. Nat. Sci. Philadelphia, 1865, p. 2.

[1] Names marked with an asterisk (*) are not now recognized as valid.

	Type locality
Cerchneis sparverius paulus Howe and King (=*Falco sparverius paulus*). Contrib. North Amer. Orn., vol. 1, p. 28, May 21, 1902.	Miami.
Ortyx virginianus var. *floridanus* Coues (=*Colinus virginianus floridanus*) Key North Amer. Birds, 1872, p. 237.	Enterprise.
Colinus virginianus insulanus Howe . . . . . Proc. Biol. Soc. Washington, vol. 17, p. 168, December 27, 1904.	Key West.
Meleagris gallopavo osceola Scott . . . . . Auk, vol. 7, p. 376, October, 1890.	Tarpon Springs.
Grus pratensis Meyer (=*Grus canadensis pratensis*) . . . . . Zool. Annalen, vol. 1, p. 286, 1794.	Clay County.
Tantalus pictus Meyer (=*Aramus pictus pictus*) . . . . . Zool. Annalen, vol. 1, p. 287, 1794.	St. Johns River.
**Tantalus ephouskyca* Barton (=*Aramus pictus pictus*) . . . . . Trans. Linn. Soc. London, vol. 12, pt. 1, p. 18, 1817.	Florida.
**Rallus giganteus* Bonaparte (=*Aramus pictus pictus*) . . . . . Journ. Acad. Nat. Sci. Philadelphia, vol. 5, pt. 1, p. 31, June, 1825.	Florida.
Rallus longirostris scottii Sennett . . . . . Auk, vol. 5, p. 305, July, 1888.	Tarpon Springs.
Rallus longirostris insularum Brooks . . . . . Proc. New England Zool. Club, vol. 7, p. 53, June 24, 1920.	Big Pine Key.
**Rallus longirostris helius* Oberholser (=*Rallus longirostris insularum*) Proc. Biol. Soc. Washington, vol. 33, p. 33, July 24, 1920.	Newfound Harbor group, Florida Keys.
Gallinula chloropus cachinnans Bangs. . . . . Proc. New England Zool. Club, vol. 5, p. 96, May 17, 1915.	Arbuckle Creek, DeSoto County.
**Glottis floridanus* Bonaparte (=*Totanus nebularius*) . . . . . Geog. and comp. list birds Europe and North Amer., p. 51, 1838.	Sandy Key, off Cape Sable.
Columba zenaida Bonaparte (=*Zenaida zenaida zenaida*) . . . . . Journ. Acad. Nat. Sci. Philadelphia, vol. 5, p. 30, 1825.	Florida Keys.
**Zenaidura macroura peninsulari* Bailey (=*Zenaidura macroura carolinensis*) Wilson Bul., vol. 35, p. 100, June, 1923.	Miami Beach.
Geotrygon chrysia Bonaparte (=*Oreopeleia chrysia*) . . . . . Compt. Rend., vol. 40, p. 100, 1855.	Florida.
Coccyzus maynardi Ridgway (=*Coccyzus minor maynardi*) . . . . Manual North Amer. Birds, September, 1887, p. 274.	Ten Thousand Islands.
Scops asio var. *floridanus* Ridgway (=*Otus asio floridanus*) . . . . Bul. Essex Inst., vol. 5, p. 200, December, 1873.	Indian River.
Speotyto cunicularia var. *floridana* Ridgway (=*Speotyto cunicularia floridana*) . . . . . Amer. Sportsman, vol. 4, p. 216, July 4, 1874	16 miles east of Sarasota Bay.
Strix nebulosa alleni Ridgway (=*Strix varia alleni*). . . . . Proc. U. S. Nat. Mus., vol. 3, p. 8, 1880.	Clearwater.
Chordiles popetue chapmani Coues (=*Chordeiles minor chapmani*) . . Auk, vol. 5, p. 37, January, 1888.	Gainesville.
**Phloeotomus pileatus floridanus* Ridgway (=*Ceophloeus pileatus pileatus*) . Proc. Biol. Soc. Washington, vol. 24, p. 33, February 21, 1911.	Prevatt's Camp, 24 miles southwest of Kissimmee.
**Tyrannus tyrannus vexator* Bangs (=*Tyrannus tyrannus*) . . . . . Auk, vol. 15, p. 178, April, 1898.	Merritt Island.
**Myiarchus crinitus residuus* Howe (=*Myiarchus crinitus crinitus*) . . Contrib. North Amer. Ornith., vol. 1, p. 30, May 21, 1902.	Istokpoga Lake.
**Progne subis floridana* Mearns (=*Progne subis subis*) . . . . . Proc. U. S. Nat. Mus., vol. 24, p. 918, June 2, 1902.	Lake Kissimmee.

Type locality

**Cyanocitta cristata florincola* Coues (=*Cyanocitta cristata cristata*) . . . Welaka.
Key North Amer. Birds, ed. 2, p. 421, 1884.

Cyanocitta cristata semplei Todd . . . . . Coconut Grove.
Auk, vol. 45, p. 364, July 6, 1928.

Corvus coerulescens Bosc (=*Aphelocoma coerulescens*) . . . . . North America (=Florida).
Bul. Soc. Philom. Paris, vol. 1, pt. 1, p. 87, 1795.

**Garrulus cyaneus* Vieillot (=*Aphelocoma coerulescens*) . . . . . St. Augustine.
Nouv. Dict. d'Hist. Nat., vol. 12, p. 476, 1817.

**Corvus floridanus* Bonaparte (=*Aphelocoma coerulescens*) . . . . . Florida.
Ann. Lyceum Nat. Hist. New York, vol. 2, p. 58, 1826.

C[orvus] a[mericanus] pascuus Coues (=*Corvus brachyrhynchos pascuus*) . Vicinity of Miami.
Auk, vol. 16, p. 84, January, 1899.

Parus carolinensis impiger Bangs (=*Penthestes carolinensis impiger*) . Deep Creek, near Lake Ashby.
Proc. New England Zool. Club, vol. 4, p. 1, March 16, 1903.

**Parus bicolor floridanus* Bangs (=*Baeolophus bicolor*) . . . . . Clearwater.
Auk, vol. 15, p. 181, April, 1898.

Sitta carolinensis atkinsi Scott (=*Sitta carolinensis carolinensis*) . . . Tarpon Springs.
Auk, vol. 7, p. 118, April, 1890.

Sitta pusilla caniceps Bangs . . . . . Clearwater.
Auk, vol. 15, p. 180, April, 1898.

Thryothorus ludovicianus var. *miamensis* Ridgway (=*Thryothorus ludovicianus miamensis*) . . . . . Miami River.
Amer. Nat., vol. 9, p. 469, August, 1875.

Cistothorus marianae Scott (=*Telmatodytes palustris marianae*) . . . Tarpon Springs.
Auk, vol. 5, p. 188, April, 1888.

**Minus* [=*Mimus*] *carolinensis grisifrons* Maynard (=*Dumetella carolinensis*). Key West.
Birds Eastern North Amer., [ed. 2], p. 710, 1896 (=Dec. 24, 1895).

Sialia sialis grata Bangs . . . . . Miami.
Auk, vol. 15, p. 182, April, 1898.

Vireo noveboracensis maynardi Brewster (=*Vireo griseus maynardi*) . . Key West.
Auk, vol. 4, p. 148, April, 1887.

**Certhiola bairdii* Cabanis (=*Coereba bahamensis*) . . . . . Indian Key.
Journ. f. Orn., vol. 13, No. 78, p. 412, 1866.

**Mniotilta varia longirostris* Baird (=*Mniotilta varia*) . . . . . Cape Florida.
Pac. R. R. Rept., vol. 9, pp. xxxi, 236, 1858.

**Helminthophaga celata* var. *obscura* Ridgway (=*Vermivora celata celata*) Enterprise.
Hist. North Amer. Birds, vol. 1, p. 192, January, 1874.

Pinacantor vigorsii florida Maynard (=*Dendroica pinus florida*) . . . Deep Creek, near Lake Ashby.
Directory Birds Eastern North Amer., pt. 9, p. 244, 1907.

Dendroica discolor collinsi Bailey . . . . . South Florida.
Bailey Mus. Nat. Hist. [Miami, Fla.], Bul. 3, November 16, 1926.

**Dendroica discolor paludicola* Howell (=*Dendroica discolor collinsi*) . . Anclote Key.
Auk, vol. 47, p. 41, January 2, 1930.

Geothlypis trichas ignota Chapman . . . . . Tarpon Springs.
Auk, vol. 7, p. 11, January, 1890.

Sturnella magna argutula Bangs . . . . . Dunedin.
Proc. New England Zool. Club, vol. 1, p. 20, February 28, 1899.

Agelaius phoeniceus floridanus Maynard . . . . . Key West.
Birds Eastern North Amer., p. 698, pl. 40, 1895.

Agelaius phoeniceus mearnsi Howell and van Rossem . . . . . Alligator Bluff, Kissimmee River.
Auk, vol. 45, p. 159, April 16, 1928.

	Type locality
Agelaius phoeniceus littoralis Howell and van Rossem . . . . . Auk, vol. 45, p. 157, April 16, 1928.	Santa Rosa Island, opposite Mary Esther.
**Quiscalus aglaeus* Baird (=*Quiscalus quiscula quiscula*) . . . . . Amer. Journ. Sci., ser. 2, vol. 41, p. 84, January, 1866.	Cape Florida.
Cardinalis cardinalis floridanus Ridgway (=*Richmondena cardinalis floridanus*) . . . . . Manual North Amer. Birds, ed. 2, p. 606, 1896.	Enterprise.
Pipilo alleni Coues (=*Pipilo erythrophthalmus alleni*) . . . . . Amer. Nat., vol. 5, p. 366, August, 1871.	Dummitts, Indian River.
**Pipilo leucopis* Maynard (=*Pipilo erythrophthalmus alleni*) . . . . Birds of Florida [=Birds Eastern North Amer.], pt. 5, p. 113, 1878.	Dummitts, Indian River.
Coturniculus savannarum floridanus Mearns (=*Ammodramus savannarum floridanus*) . . . . . Proc. U. S. Nat. Mus., vol. 24, p. 915, 1902.	Kissimmee Prairie, 7 miles east of Alligator Bluff.
Ammodramus maritimus peninsulae Allen (=*Ammospiza maritima peninsulae*) . . . . . Auk, vol. 5, p. 284, July, 1888.	Tarpon Springs.
Passerherbulus maritimus juncicola Griscom and Nichols (=*Ammospiza maritima juncicola*) . . . . . Abstr. Proc. Linn. Soc. New York, no. 32, p. 25, November 3, 1920.	East Goose Creek, Wakulla County.
Ammodramus maritimus var. *nigrescens* Ridgway (=*Ammospiza nigrescens*) . . . . . Bul. Essex Inst., vol. 5, p. 198, December, 1873.	Merritt Island.
**Ammodramus melanoleucus* Maynard (=*Ammospiza nigrescens*) . . . Amer. Sportsman, vol. 5, p. 248, January 16, 1875.	Indian River, near Dummitts.
Thryospiza mirabilis Howell (=*Ammospiza mirabilis*) . . . . . Auk, vol. 36, p. 86, January 5, 1919.	Cape Sable.
Melospiza melodia beata Bangs . . . . . Proc. New England Zool. Club, vol. 4, p. 85, June 5, 1912.	Enterprise.

HISTORY OF BIRD PROTECTION IN FLORIDA

By Robert W. Williams

FOREWORD

That Floridian is indeed an ingrate who does not view with deep and lasting gratitude the wealth of bird life, specifically and numerically, with which Nature has so bountifully endowed his State, and who will not wish, as we are wont to do with our worldly possessions, to preserve and transmit to posterity an equitable share of it. Yet there are those, fortunately diminishing in numbers with each succeeding year, who, reckless of this great heritage and of the rights and interests in it of their fellow citizens and those to come hereafter, must needs be restrained in their venatic excesses by the strong hand of the law.

And so it is that the author has asked me to write a chapter for his book on the history of bird protection in Florida. This history must be gathered largely from the acts of its legislative bodies since it became a part of the United States, to which I shall add references to measures taken by the Federal Government and to some activities of unofficial organizations for bird conservation in this State.

HISTORY OF LEGISLATION

Florida was organized as a Territory in March, 1822, and the first legislature (then called the legislative council) met in Pensacola in June of that year.

The Territory was then sparsely inhabited, the southern, or peninsular, section hardly at all. The forests, swamps, and prairies were primeval and of vast extent, abounding in wild life of every indigenous species. Travel was slow and tedious, firearms were crude, and markets for the fruits of gun or trap were practically nonexistent. Hence the need for bird protective measures at that time was not apparent, and the early legislatures were not much concerned with the subject. As time went on, however, the human population increased, more efficient firearms and modes of travel were developed, market requisitions for game and plumage made their appearance, and protective measures of more or less limited operation began to press for attention. Finally, in the last twenty years, with the advent of modern conditions as they affect birds, few legislatures have met that have not considered and enacted conservation measures of extensive scope and operation, albeit many were restricted to one or a few counties.

PERIODS

The session laws disclose four quite distinct and well-marked periods of general legislation in regard to bird protection: (1) From 1827 to 1875, during which measures adopted were rather for the protection of persons and property affected by hunting than for pro-

tection of the wild life; (2) from 1875 to 1891, when the laws extended limited protection to deer and to Turkeys, Quail, sea and plume birds, and the Mockingbird; (3) from 1891 to 1913, during which restrictions on hunting and catching deer, Turkeys, and Quail were increased; ducks, otter, and beaver were protected by close seasons; and comprehensive protection was given to all nongame birds except a few regarded as injurious; and (4) from 1913 to the present time, during which protection has been extended to all game birds and fur-bearing animals; modern restrictions on taking, use, and disposition of game have been imposed; and efficient state-wide measures adopted for enforcement.

Laws passed during the first period need not be considered here. During the second period (1875–1891) deer, Turkeys, and Quail were the only game considered worthy of or requiring protection, and such protection was at best very meager.

The first regulation providing a close season and protection for nests, eggs, and young of birds was included in the act of 1877, prohibiting hunting, killing, or capturing deer, Turkeys, Quail, and Mockingbirds between April 1 and September 1, and destruction of the nests, eggs, or young of the birds. But the season was for only five months, and the regulation was not applicable to owners hunting on their own enclosed lands or killing deer or Turkeys to protect crops, and, furthermore, the act was to become operative in any county only in the event the county commissioners should publish it in their county.

Inclusion of the Mockingbird in the protection accorded by this act, though it was for only five months in the year, and the passage during the same year of an act to prevent wanton destruction of nests, eggs, and young of sea birds and birds of plume, mark the beginning of legislation for the protection of nongame birds, due to an awakening to the devastation caused by the merciless operations of agents of millinery houses in the North. The act was repealed two years later and nothing substituted until 1891.

In 1879 aliens were forbidden to kill plume birds. There was no further legislative activity for the protection of birds until twelve years later, and it truly may be said that from 1879 to the close of this period in 1891 there was virtually no protection by law for wild life of any kind in the State.

PROTECTION OF BIRDS FROM 1891 TO 1913

By 1891 the necessity for protection of a more comprehensive nature than formerly in effect was plainly manifest, and that year was marked by a resumption of legislative interest in wild life. Hunting or killing Turkeys or Quail except from November 1 to March 1 was prohibited, and the possession and sale of these birds in close season after they had been killed were made unlawful. It was forbidden to take or kill any Turkey or Quail at any time with trap, net, or snare, or to set a net, trap, or snare to take them, or to possess or sell them when so taken; but it was provided that these prohibitions should not apply to persons trapping Turkeys or Quail on their own enclosed lands. Penalties prescribed were not less than $5 nor more than $10 for each bird illegally killed, trapped, netted, or snared, sold, or had in possession. Nothing in the act was to prevent any person from protecting his crops from depredations of deer, Turkeys, or Quail. Informers were allowed half of the fine; the other half went to the county school fund.

Another effort was made at this session to curb the destruction of plume birds by an

act prohibiting the killing of cranes, egrets, ibises, curlews, and herons for sale or traffic. While far in advance of any former attempt to protect nongame birds, this failed to accomplish its purpose owing to inadequate means of enforcement.

In 1893 the first complete nonexport law was enacted, but it was limited to Quail, the shipment of which from the county where killed or trapped was prohibited, under penalties of $100 to $500, or sixty days in jail.

In 1895 an act was passed that virtually codified, with some important amendments, the meager game laws then in force. It was made unlawful to hunt Turkeys and Quail between March 15 and November 1 except on one's own enclosed premises, or to sell or possess them in close season; trapping Quail at any time except on one's own enclosed premises was forbidden; and prohibition of shipment of Quail from the county where killed was extended to venison and Turkeys, with the exception that hunting parties might take their game home with them in the State but could not sell it. For the first time a limit on the number of Turkeys and Quail that might be killed in a day by each hunter or party of hunters, except on their own enclosed premises, was prescribed—4 Turkeys and 25 Quail by an individual, 50 Quail by a party. Five years' absolute protection was given to pheasants, which had been recently introduced into the State, and the hunting-trespass law was extended to unenclosed posted lands.

Despite these laws, excellent as far as they extended, game and other birds continued to be killed at all seasons and without limit, as ordinary officers of the law either countenanced violations or were too busy with other duties to prevent them. Hence, in 1897 an act was passed to authorize the Governor on the recommendation of the county commissioners to appoint a game warden for each county, with power to arrest offenders and seize implements used by them. The term of office was four years, and the salary was to be fixed and paid by the commissioners. It was made a misdemeanor for any warden to fail to take cognizance of and prosecute any violation coming to his attention.

In 1899 the game law of 1895 was, in effect, re-enacted with modifications and additions. The open season on Turkeys and Quail was reduced by elimination of the first 15 days in March, but "except on his own enclosed premises" still persisted. The daily bag limits with exception in favor of persons hunting on their own enclosed premises remained the same, except for the addition of a limit of 6 Turkeys for a party of two or more. The sale of Turkeys and Quail was still allowed in the open season. Trapping Quail, with the stereotyped exception about owners of enclosed premises, continued to be forbidden. A very important advance was made at this session by the enactment for the first time of a law to protect wild ducks, but it merely prescribed a close season—April 1 to October 1.

Although some restrictions on nonresidents had been in force at one time or another since 1851, the modern nonresident hunting license did not appear until this act, by which every such person wishing to hunt deer, Turkeys, and Quail was required to obtain a $10 license in the county in which he proposed to hunt. The proceeds were to be devoted to payment of the salary and fees of county game wardens, and if there was no game warden in the county, they were to be added to the fine and forfeiture fund.

Despite the laws for their protection, the ruthless slaughter of plume birds continued unabated, until these birds, once so numerous, had been reduced to the verge of extermina-

tion. For years other nongame birds had been shot, trapped, and otherwise persecuted, greatly to the detriment of the agricultural and horticultural interests of the State, which suffered through the destruction of these efficient checks on the increase of injurious insects, and on the spread of noxious weeds.

Finally, in 1901, the so-called American Ornithologists' Union model nongame bird law was enacted, with certain minor changes. It was an all-embracing measure for the protection of wild birds other than game birds and a few species regarded locally as harmful, such as Sharp-shinned and Cooper's Hawks, Great Horned Owls, crows, "jackdaws," "ricebirds," Meadowlarks, and Butcherbirds; and game birds were specifically defined as—

> Anatidae, commonly known as swans, geese, brant, and river and sea ducks; Rallidae, commonly known as rails, coots, mud-hens, and gallinules; Limicolae, commonly known as shore birds, plovers, surf-birds, snipe, woodcock, sandpipers, tatlers and curlews; Gallinae, commonly known as wild turkeys, grouse, prairie chickens, pheasants, partridges and quails; also turtle doves, tame and wild pigeons, and robins.

The foregoing definition of game birds, with the elimination of pigeons and Robins, has persisted in every comprehensive general game law and in several local laws subsequently enacted, and it is not too much to say that it has inspired the extension, belated though it was, of protection to those large groups of shore and marsh birds and to doves and some wild fowl that previously had received no legislative consideration.

Though long delayed, this act marked the turning point in wild-bird protection in Florida. Immediately following its passage, protection, which had been impossible under previous restricted laws, was extended to the only known nesting colony of Brown Pelicans on the east coast, and shortly afterwards Pelican Island in Indian River, on which the colony was located, was made a Federal reservation by order of President Roosevelt. This was the first national bird reservation to be established in this country and was the forerunner of 13 others of like nature in Florida and many others scattered throughout the United States and Alaska.

With the basic principles of nongame-bird protection now legislatively established, attention at the next session of the legislature, in 1903, again reverted to Turkeys and Quail. The restrictions imposed by the act of 1899 in behalf of these birds were materially increased, and the exception that had allowed owners of enclosed lands to kill them at any time thereon was eliminated. While the daily bag limits remained the same, the exception in favor of those hunting on their own enclosed lands was eliminated, and the prohibition against trapping Quail, except on one's own enclosed premises, was now changed so that the exception applied only to enclosed cultivated premises. Prohibition of sale of game at any time was now extended to Turkeys and Quail, and, as formerly, their shipment beyond the county in which killed was prohibited, except by hunters taking their game with them to their homes in the State, not for sale.

In 1905, sections 3 and 6 of the act of 1903 were amended so that the daily bag limits on Turkeys and Quail were reduced from 4 and 25, respectively, to 2 and 20, and for a party of two or more, from 6 to 4, and 50 to 40, respectively, and a yearly limit of 5 Turkeys was now prescribed for each hunter, but the prohibition of trapping Quail was

eliminated. Other acts forbade the killing of Turkey hens in Polk County for five years, and of Limpkins and alligators on the Oklawaha River at any time.

From 1907 to 1913 the only legislation of any significance or importance affecting game or other birds was the act of 1909 to encourage the establishment of unenclosed game preserves and the introduction and propagation of game birds. It authorized owners or lessees to post not exceeding 640 acres of unenclosed lands for raising introduced and native game birds and forbade others to hunt thereon, the owners or lessees to be subject to the laws regulating hunting. Every one was forbidden to hunt or kill any Hungarian Partridge, Ring-necked Pheasant, or other non-native game bird placed, raised, or propagated on any game preserve or elsewhere in the State for three years.

General legislation for the protection of the game birds of the State continued to lag. The only general laws in force at the end of the third period (1891 to 1913) for the protection and preservation of this natural resource were:

(1) A law prohibiting the hunting or possession of Turkeys and Quail from March 1 to November 1; the killing in a day by one person of more than 2 Turkeys and 20 Quail, and by a party of two or more of more than 4 Turkeys and 40 Quail; the killing of more than 5 Turkeys a year by any person; sale of Turkeys and Quail, and their shipment out of the county in which killed, except by hunters taking their game with them to their homes in the State, not for sale.

(2) A law prohibiting the shooting of wild ducks between April 1 and October 1.

PROTECTION OF FLORIDA WILD LIFE SINCE 1913

A new era in the conservation of wild life began in 1913 with the enactment of two modern, comprehensive, and complementary acts, one entitled "An Act to Protect Game and Birds in the State of Florida," and the other, "An Act Creating a Department of Game and Fish of the State of Florida and Creating the Office of State Game Commissioner." The first, embracing 27 sections, opened with the declaration that the title and ownership of all wild birds and game in the State are vested in the State for the purpose of regulating the use and disposition thereof. While the declaration was unnecessary from a legal viewpoint, since such ownership was already in the State without the declaration, it served to warn that he who should essay to hunt, take, or otherwise molest or deal with game and wild birds must first look to the act to ascertain what privileges it granted or withheld.

The act defined game birds as they had been defined in the 1901 nongame-bird law, but omitted pigeons and Robins, fixed an open season (November 20 to February 20) for deer, squirrels, Turkeys, Quail, doves, swans, geese, brant, ducks, rails, coots, sandpipers, curlews, snipe, and plover, and prohibited hunting or trapping of imported game birds before December 1, 1915. It forbade the use of pitfalls, deadfalls, scaffolds, cages, snares, nets, saltlicks, blind pens, baited hooks, baited fields, or any similar device, or explosives, for capturing or killing birds or animals protected by law, but added the phrase "except upon his or her own enclosed lands" that had so long persisted, in one connection or another, in the game laws of the State. It prohibited the killing of hen Turkeys at any time; it prohibited night hunting (between dark and daylight) of all birds; it embodied all the substantive provisions of the nongame-bird law of 1901 and

included prohibition of the taking, at any time or place, of nests or eggs of all wild birds, whether game or nongame. It fixed daily bag limits of 2 Turkeys, 20 Quail, and 25 birds of any other species, and seasonal limits of 5 Turkeys and 500 of any other game-bird species, and it made unlawful the possession of game birds more than 5 days after the close of the open season. It prohibited the sale or barter of game birds at any time, as also their shipment or transportation out of the State or in the State except when in the personal possession of the licensed owner, and made common carriers liable for transporting game under any other circumstances. It prescribed many procedural short cuts to simplify enforcement and required all circuit judges and judges of concurrent jurisdiction to give the act in charge to the grand juries and urge inquiry into infractions thereof. It repealed all local and general laws in conflict with it.

The second act mentioned, embracing 35 sections, established a Department of Game and Fish and the Office of State Game and Fish Commissioner. The Commissioner and wardens were empowered to serve criminal process, to arrest without warrant persons violating the game laws, and to seize all birds caught, killed, and possessed in violation of law. Sheriffs, their deputies, constables, policemen, and other peace officers were made ex officio deputy game wardens. Any person desiring to hunt game was required to obtain a license, as follows: Residents of the State to hunt in their own counties, $1, and to hunt anywhere in the State, $3; nonresidents and aliens to hunt in a single county, $15; owners and lessees of land were allowed to hunt on their own lands without a license. The Commissioner was authorized to issue a certificate to a properly accredited person, upon payment of $1, to collect birds and their nests and eggs for strictly scientific purposes, and to issue a permit to any person, on payment of a like sum, to take and transport, in or out of the State, not more than ten pairs of any species of bird for scientific or propagating purposes. All laws in conflict with the act were repealed.

Another act of this session, relating solely to the Robin, forbade any one to kill, wound, catch, sell, ship, transport, or possess, living or dead, such bird, except for scientific or economic purposes by a department of the State or Federal government, under permit from the Commissioner of Agriculture.

The first State Game and Fish Commissioner, E. Z. Jones, stated in his second annual report:

> The game and fish laws, as enacted by the Legislature of 1913, at first met with strong disfavor, especially when efforts were made to rigidly enforce them. There was much defiance of the officers of this Department in the enforcement of the game and fish laws, but I have met the opposition fairly successfully. . . . It is a great satisfaction to me to be able to say that the country people, especially the farmers, are falling in line of support of the laws governing this Department. . . . When this Department was created Florida quail were being shipped to various States and countries at not more than fifty cents each, and the price generally was twenty-five cents each. By reason of the fact that I have refused permission for animals and birds to be shipped from this State for commercial purposes, prices have been steadily going up. There is a ready market for quails at thirty dollars per dozen; wild turkey hens, twenty dollars each; and gobblers, sixteen dollars each.

Mr. Jones reported for the year March 1, 1914, to March 1, 1915, receipt of $42,177 from hunting licenses, and the prosecution of 413 persons for violations of the game and fish laws. Thus did the State's obligation to conserve its wild-life resources seem to be on the way to measurable fulfilment. But it was not destined long to be so.

In 1915, after passing "An Act to encourage the destruction in the State of Florida of the birds commonly called Turkey Buzzard and Black Vulture," which recited that it had been made to appear that these birds distribute hog cholera and other disease germs that cause great destruction of animals and loss to the people of the State, and provided that it should be lawful to kill and destroy them at any time, the legislature enacted a statute declaring the ownership and title to all wild birds and game in the State to be vested in the respective counties of the State for the purpose of regulating the use and disposition of the same, and repealing the two acts of 1913 and all general and local laws in conflict therewith. This statute embraced 40 sections and was almost a literal composite of the two acts of 1913, with some changes in seasons, bag limits, and other like particulars, and with modifications necessary to meet the scheme of its administration by the several counties through their boards of county commissioners. It extended the open season on game birds to March 10; removed Mud Hens and Marsh Hens from protection of a close season; removed the restrictions on killing hen Turkeys; increased the seasonal bag limit on Turkeys to 10, but reduced the seasonal limit on other species of game birds to 300, and eliminated the privilege that owners had had under the previous act to trap, net, snare, bait, poison, etc., birds or animals on their own enclosed lands. It required the board of county commissioners in each county to employ and fix the salary of a resident of the county to be county game warden until January, 1917, and thereafter to employ as such warden the person recommended by nomination in the preceding primary election, the term to be two years.

Thus ended for a time the Department of Game and Fish of the State of Florida and the hopes and aspirations of all those far-sighted citizens who had labored so earnestly and so long to see the game laws administered by the State itself through a central agency adequately equipped for effective accomplishment.

In 1917 the open seasons on game birds were shortened and made uniform—November 20 to March 1; in 1921 the open seasons were still further shortened—November 20 to February 15; seasonal bag limits on Turkeys were reduced to 5, and a limit of 5 Turkeys was prescribed for a party of three or more persons hunting or camping together at any one time or during any one camping or hunting trip.

In 1921 the requirement of six months' residence in the county to entitle a resident of a county to a license to hunt therein was eliminated, and the license fee was increased to $1.25. At the same time, the license fee required of a resident of the State to hunt in any county other than his own was increased to $3.50, and the nonresident and alien fee to $25; the privilege of hunting in one's own voting precinct without a license was eliminated; sheriffs were required to enforce the law in counties having no warden.

At the same session a concurrent resolution was adopted, reciting the rapid destruction of wild life in Florida, the importance of conserving it, and the dependence in most part on the attitude of the citizens of the State for enforcement of the game laws, and resolving that all good citizens of the State be called upon to organize in every community a "Florida Wild Life League" under articles of organization similar to those adopted by such an organization of Orange County, Florida. Then follow those articles in full. The resolution concludes "That the Wild Life League of Fort Myers, in Lee County, Florida, shall be recognized as the parent organization in the State of Florida, and that Dr. George

S. Stone, of Fort Myers, Florida, the founder of the League, shall be recognized as such throughout this State."

It is said that nothing is ever settled until rightly settled. The expediency of entrusting administration of the game laws to the several counties had now been tested since 1915. Six years thereafter, as heretofore stated, the Legislature, in a concurrent resolution, recited the rapid destruction of wild life in Florida and the importance of conserving that life, and called upon the citizens to organize a wild-life league in every community, but the Legislature itself postponed action of an effective nature until 1925.

At the 1925 session an act was passed creating a Department of Game and Fresh Water Fish and the office of State Game and Fresh Water Fish Commissioner, with powers appropriate to the exigencies of game- and fish-law enforcement. The Commissioner was authorized to employ deputies, whose commissions should cover the entire State, and, vested with the same powers as deputy sheriffs and peace officers, they were authorized to arrest without warrant when offenses were committed in their presence.

The act provided that nothing therein should be deemed to alter, repeal, or modify any present or future local or special law or the power of local authorities to enforce them or this act. It repealed all general laws in conflict with it and thereby abolished the system of county game wardens established by the act of 1915 and its amendments, but it left in operation any existing local system of game wardenships. At the time this act was passed there were in force no fewer than eighty local game laws, to say nothing of acts to protect fresh-water fish. A few of the counties had their own wardens.

Under the administration of J. B. Royall, State Game and Fresh Water Fish Commissioner from 1925 to 1929, progress was made in the cause of bird protection in the State. In his second annual report, among many other things, he reported an increasing number of citizens organizing for wild-life conservation and an increasing number of conservation departments being established by civic organizations, and mentioned the prominent place being given in school programs to nature study. He alluded to the recognition granted his Department by his appointment by the Secretary of Agriculture as one of the fifteen members of the Federal Advisory Board under the migratory-bird treaty act. He recommended the enactment of a state-wide game- and fresh-water fish law and the abrogation of the local laws, of which there were then more than one hundred and sixty.

Twenty days prior to the date of the commissioner's second report, above referred to, that is to say, on June 10, 1927, the governor had approved an act of 77 sections passed by the legislature of that year. This act repealed all general and special laws relating to game, fur-bearing animals, birds, and fresh-water fish, whether or not in conflict with it. With meticulous detail the act prescribed the restrictions on hunting, trapping, fishing, or in any wise dealing with game, fur-bearing animals, birds, and fresh-water fish. It asserted the State's title to and ownership of all nonmigratory birds and all game and fur-bearing animals and assumed, consistently with the laws of the United States, the conservation and protection of all migratory birds. It defined game birds as they had been defined in the nongame-bird act of 1901, omitting, like its predecessors, pigeons and Robins; and all wild birds other than these were classed as nongame birds. A Depart-

ment of Game and Fresh Water Fish, the office of State Game Commissioner, and a Wild Life Conservation Commission were created.

The Governor was required to appoint a Wild Life Conservation Commission, composed of five members, one from each congressional district and one for the State at large, and these were required to have intimate knowledge of wild life. Their terms of office were four years, and they were to assist and advise with the State Game Commissioner in the establishment of fish hatcheries, game farms, game refuges, game breeding grounds, and in the acquisition of State game lands.

With the advice and approval of the Governor and the Wild Life Conservation Commission, the Commissioner was authorized to establish game farms and breeding grounds, and breeding grounds for nongame birds and fur-bearing animals; to acquire lands and waters suitable for the protection and propagation of game, fish, nongame birds, and fur-bearing animals, and for hunting purposes, any purchase not to exceed $10 an acre; to close any lake or stream for breeding grounds for game, fish, nongame birds, and fur-bearing animals; and to close any county or part thereof to hunting or trapping for such period as agreed upon. With approval of the Governor, in emergencies such as floods, fires, and storms, the Commissioner was authorized to close to hunting any area affected. He was empowered to establish and maintain State game refuges and to lease shooting privileges on lands surrounding such refuges for public shooting grounds and to take game, fur-bearing animals, and nongame birds at any time for propagation, restocking, and scientific purposes, as well as to permit the Biological Survey of the Federal Department of Agriculture to take specimens of birds, game, and fur-bearing animals for scientific purposes.

Open seasons were prescribed as follows: Quail, November 20 to February 15; Turkeys, doves, geese, ducks (except Wood Ducks), brant, coots, gallinules, and Wilson's Snipe, November 20 to January 31; rails (formerly not protected), September 15 to November 30, and then only on salt-water marshes; and it was provided that no open season should be permitted on any other game birds.

Persons were forbidden to kill any birds, except those for which an open season was prescribed and a few regarded as injurious, including buzzards, or to take their eggs at any time, except for scientific purposes under permit from the Commissioner, who was also authorized to issue a permit to property owners to kill nonmigratory nongame birds destroying crops on their property; but when the birds were found in the act of destroying such crops and other property, they might be killed without permit. The use for domestic or commercial purposes of the flesh or feathers of birds thus killed, in close season, was forbidden.

Bag limits were as follows: Daily, 2 Turkeys; 15 each of Quail, ducks, snipe, and gallinules; 25 each of doves and rails, or 25 rails and gallinules in the aggregate; 20 Coots; and 5 each of geese and brant. Seasonal, 5 Turkeys and 200 of any other species of game birds.

Game birds could be taken only in the daytime between half an hour before sunrise and sunset, and with a shotgun not larger than 10 gauge fired from the shoulder, or with a rifle. They could not be taken from an automobile or train, or by aid of any lights, nets, traps, snares, salt-lick, or poison, or from an airplane, power boat, sailboat, or

boat under sail, or any device towed by a power boat or sailboat, or on any baited field or waters. Persons were forbidden to shoot Quail while they were on the ground, or to hunt Turkeys with dogs.

Licenses were provided for, as follows: For residents, hunting in county of residence, $2; in any other county, $5; in State at large, $10. For nonresidents, hunting in State at large, $25; for aliens, hunting in State at large, $50. The sale and purchase of game, as well as of nongame birds, were prohibited at all times. Transportation of game was forbidden except by persons holding hunting licenses and then within very circumscribed limits.

At the same session of the legislature two companion and identical acts were passed to establish a game and bird and wild-life sanctuary on the area one mile on either side of the center line of the Tamiami Trail in Dade and Collier Counties. It was made unlawful within the sanctuary to discharge a firearm or to kill, hunt, chase, injure, trap, capture, or destroy any birds, animals, or other wild life, and the sheriffs, constables, peace officers, and game wardens in these counties were required strictly to enforce the acts.

By a Senate concurrent resolution of April 23, 1927, the Mockingbird was designated as the State bird of Florida.

Mr. Royall, in his third annual report as State Game Commissioner, announced the establishment of thirty-six breeding grounds and refuges closed to all shooting, aggregating 4,660 square miles, and the restocking of covers with Quail and Turkeys. A deputy of the Department spent nine months organizing bird-study clubs in elementary schools, a work that resulted in the enrollment of 8,000 boys and girls. This deputy also devoted some time to organizing camps for boy scouts and for the "4-H" clubs of the rural sections. Other activities of the Department included exhibits at fairs, a moving-picture exhibit of 10,000 feet of film depicting the native wild life of the State, and distribution of educational literature.

Governor Carlton, on February 25, 1929, appointed C. C. Woodward, of Tampa, to succeed Mr. Royall, and he entered upon his duties on that date, at Tallahassee. On June 10, 1929, exactly two years after approval of the act of 1927, the Governor approved an act of 75 sections, repealing all other general or special laws relating to game, freshwater fish, birds, alligators, and fur-bearing animals, whether or not in conflict with it. This act is now in force and is in the main a repetition of that of 1927. The Wild Life Conservation Commission was abolished. Consent was given to acquisition by the United States, in accordance with section 5 of the act of Congress of February 18, 1929, of areas for migratory-bird refuges. The open season on Turkeys and migratory game birds, such as ducks, was extended to February 15. This was inoperative, however, as to migratory game birds under the then existing Federal regulations, which closed the season on these birds after January 31.[1] The section relating to the killing of birds that were destroying crops and other property was reduced to the simple provision that nothing in the act shall prevent one from killing the birds on his own property when found destroying crops and other property, but not with poison except under special permit from the Commissioner.

[1] Under the Federal regulations now (1931) in force, the season on migratory waterfowl is November 20 to December 19, inclusive.

At the same session an act was passed to regulate the establishment and operation of private game preserves and farms, which are to be enclosed and limited to 640 acres. Game raised or produced on such preserves or farms is considered to be private property and may be sold or disposed of under the various restrictions imposed by the act.

An act was also passed, applicable to Collier County only and saved from repeal by the general act, prescribing a closed term until July 1, 1934, for Turkeys, and forbidding possession thereof, dead or alive, during the term. Certain other provisions were made concerning Quail and the seasons during which they might be lawfully taken.

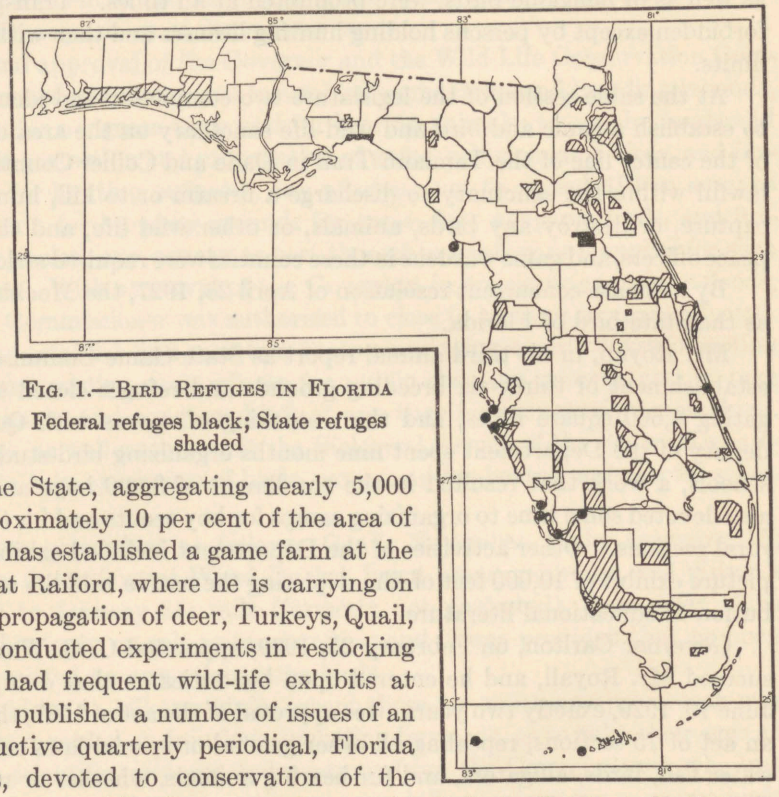

FIG. 1.—BIRD REFUGES IN FLORIDA
Federal refuges black; State refuges shaded

Commissioner Woodward, among many other regulations of interest to conservationists, has closed to hunting 44 areas throughout the State, aggregating nearly 5,000 square miles, or approximately 10 per cent of the area of the State (see fig. 1); has established a game farm at the State Prison Farm, at Raiford, where he is carrying on investigations in the propagation of deer, Turkeys, Quail, and pheasants; has conducted experiments in restocking depleted areas; has had frequent wild-life exhibits at State and local fairs; published a number of issues of an attractive and instructive quarterly periodical, Florida Woods and Waters, devoted to conservation of the State's wild-life resources; and has inaugurated a monthly bulletin distributed widely, in which statistics are given on the operation of the game law and on the finances of his Department, together with current items of interest relating to wild life.

FEDERAL PARTICIPATION IN GAME AND BIRD CONSERVATION IN FLORIDA

On May 25, 1900, the United States, for the first time, entered the general or nation-wide field of game and bird conservation when the President approved what is popularly known as the Lacey Act, its author and sponsor being the late John F. Lacey, a representative in Congress from Iowa, which State, it may pertinently here be recalled, was admitted to the Union simultaneously with Florida.

The act enlarged the duties and powers of the Department of Agriculture to include the preservation, distribution, introduction, and restoration of game and other wild birds. It forbade the importation into the United States of the mongoose, flying fox or fruit bat,

English Sparrow, and Starling, and such other species as the Secretary of Agriculture should declare to be injurious, and prohibited interstate commerce in the dead bodies of wild animals or birds killed in violation of the laws of the State in which killed. It subjected to the operation of State laws the dead bodies or parts thereof of all wild game animals and game or song birds coming into the State from elsewhere, whether in original packages or not.

The act was intended as, and soon developed to be, an efficient check upon illicit shipments of wild animals and birds and their skins and plumage to markets in States other than those in which they had been killed; and thus it greatly assisted the States in obtaining better observance of their game laws.

With its duties extended to wild-animal and bird conservation and with enforcement of the penal provisions of the act, the Department of Agriculture, through its Division (now Bureau) of Biological Survey, immediately entered upon a program of coöperation with the States; and in the following year, 1901, Dr. T. S. Palmer, then in charge of the administration of the Lacey Act in the Biological Survey, attended a joint meeting of the Senate and House committees on game of the Florida Legislature and gave valuable expert information relating to the bill then pending before them, which resulted in the epochal act of 1901 for the protection of all nongame birds in the State other than a few noxious species.

This act gave impetus to the extension of Federal activity in Florida for conservation of wild life, and in 1903, as heretofore stated, President Roosevelt, by the first Executive order of its kind ever issued, set aside, under control of the Secretary of Agriculture, the Federal-owned Pelican Island, in Indian River, as a reservation and breeding ground for native birds. The reservation included the breeding home of a large colony of Brown Pelicans, which has attracted the attention of tourists and nature lovers during the last hundred years. Thirteen other reservations of a similar character have been created in the State. Most of these reservations embrace numerous islands or keys, largely of the mangrove type, and serve their highest usefulness as sanctuaries for the interesting forms of wild life that resort to them. The most important reservations are policed, either all the year or during the breeding season, by wardens maintained by the Biological Survey. (See fig. 1.)

Under the act of Congress of February 18, 1929, the United States Department of Agriculture has acquired a large tract of marsh land on the coast of Wakulla, Jefferson, and Taylor Counties, east of St. Marks Light, which has been set aside as the St. Marks Migratory Bird Refuge, to be administered by the Biological Survey.

In 1908 Congress directed officials of the Forest Service to aid in every way practicable in the enforcement of the laws of the States for the protection of game and fish, and in 1930 Congress authorized the President to designate areas in the Ocala National Forest, in Marion County, as game refuges in which no hunting would be allowed.

After the adoption of regulations under the original migratory-bird law in 1913, the Biological Survey maintained a warden in Florida, and under the migratory-bird treaty act of 1918, it now has a game protector stationed in the State, who coöperates with the State Game Department in conservation activities.

FEDERAL BIRD REFUGES IN FLORIDA ADMINISTERED BY THE U. S. BIOLOGICAL SURVEY

Name	*Date established*	*Location*
Pelican Island	March 14, 1903	Indian River, near Sebastian
Passage Key	October 10, 1905	Mouth of Tampa Bay
Indian Key	February 10, 1906	Boca Ciega Bay, near Maximo Point
Tortugas Keys	April 6, 1908	Tortugas Keys, about 60 miles west of Key West
Key West	August 8, 1908	Near Key West
Pine Island	September 15, 1908	In Pine Island Sound at entrance to Charlotte Harbor
Matlacha Pass	September 26, 1908	East of Pine Island
Palma Sola	September 26, 1908	Palma Sola Bay
Island Bay	October 23, 1908	Charlotte Harbor, near Boca Grande
Caloosahatchee	July 1, 1920	Near Fort Myers
Brevard	October 21, 1925	Southern part of Mosquito Lagoon, near Merritt Island
Matanzas	August 10, 1927	Matanzas River, near Matanzas Inlet
Cedar Keys	July 16, 1929	Suwannee Sound, near Cedar Keys
St. Marks	January 1, 1931	Between St. Marks Light and mouth of the Aucilla River

THE NATIONAL ASSOCIATION OF AUDUBON SOCIETIES

The long and unremitting, but finally triumphant, struggle of the National Association of Audubon Societies for the rescue from extinction of the plume birds of Florida presents a record probably unparalleled in the annals of conservation in this or any other country. No organization has ever encountered more disappointments and more bitter discouragement in its efforts, and none has ever overcome them with more splendid success. It is an interesting and inspiring story of devotion to a worthy cause and of the power of grim determination. But space here forbids more than a meager summary of the Association's activities in Florida.

By 1886 traffic in wild birds and their plumage had become so widespread and alarming in the United States that ornithologists and others began to think about ways and means to combat it. The American Ornithologists' Union appointed a committee on protection of North American birds to seek some means of curbing the rapid destruction of wild birds, especially the nongame species, which committee led to the establishment of the United States Biological Survey.

In 1886, Forest and Stream, in a timely editorial, proposed the organization of a society for the protection of wild birds to be named in honor of the great American ornithologist, John J. Audubon. Such an organization was soon in existence, and a magazine devoted to bird protection was issued, but after a few years the society practically ceased to function. Meanwhile, in several States, led by Massachusetts in 1896, Audubon Societies had been formed and had become active. The Florida Society was organized at Maitland in March, 1900.

In November, 1901, the societies of the several States formed the National Committee of the Audubon Societies, which began active work early in the next year, with headquarters in New York City. Each State society retained its identity and continued to operate within its respective State as an agency in wild-life conservation. In January, 1905, this National Committee was incorporated under the laws of New York as the National Association of Audubon Societies.

In 1892 a single millinery agent reported that in the previous year he had shipped 130,000 birds from Florida for millinery purposes; and so general had become the fashion to decorate women's hats with birds and their plumage that the plume birds of Florida had been reduced to such scanty numbers that two of them, the American and Snowy Egrets, were well-nigh extinct. This situation early engaged the attention of bird lovers, and in May, 1901, William Dutcher, chairman of the committee on bird protection of the American Ornithologists' Union, procured the introduction in the Florida Legislature of the so-called model nongame-bird bill drafted and proposed by the Union and already in force in several of the Northern States. He also appeared before the legislative committees in advocacy of the measure, and the bill was enacted into law at that session and has been in force in this State ever since. The following year the National Committee of the Audubon Societies employed four wardens to guard several rookeries of plume birds in the southern part of the State and continued thus to protect them for several years. In July, 1905, one of these wardens, Guy M. Bradley, patrolling the Cape Sable region, was brutally murdered by plume hunters, and another, Columbus G. McLeod, of the Charlotte Harbor section, was killed in 1908. While these reverses temporarily checked the activities of the Society in this State, they only served to stimulate its determination to save the remnant of the plume birds.

The National Association of Audubon Societies, throughout its activities in Florida, has distributed much literature in the form of books, pamphlets, circulars, charts, and the like, relating to birds and their protection. It has organized 2,000 Audubon clubs among the children of the State, the total membership of these as of November 1, 1930, being 71,435. Its lecturers have spent many months in the schools and colleges of the State. Most of the bird reservations in Florida were established by the Presidents of the United States through its efforts, and it has from time to time either wholly or partially financed the wardens at the more important of these. It has furnished efficient launches and boats for patrol duty at these reservations, and has itself purchased and protected an important area of forty acres in Orange Lake in central Florida, where numbers of the State's most interesting and beautiful species of water birds congregate to nest. It guards an important rookery of mixed species of water birds at Micanopy, in Alachua County, one in Jefferson County, and one on the Sebastian River. It has expended many thousands of dollars in Florida both in educational work and in policing breeding colonies of birds, and has furnished funds for procuring evidence of violations of the State's bird laws and coöperated closely with the State Game Department, furnishing many hundreds of pamphlets and circulars for distribution throughout the State. In 1908 it procured an order of the Treasury Department that put a stop to the bringing into Key West of great quantities of eggs of sea-birds from the Bahamas, a practice that had furnished cover for the entry of similar eggs unlawfully taken in this country. For the season of 1930 the Association paid the salaries and expenses of eight United States game protectors working in the Everglades.

To-day, as a result in very great measure of the work of this Association, one can see in suitable territory in practically any part of Florida goodly numbers of the American and Snowy Egrets, which only a few years ago were virtually on the verge of extirpation. Not only this, but other beautiful and useful species, such as the ibises, the Great Blue,

Little Blue, Green, Louisiana, and Black-crowned and Yellow-crowned Night Herons, have greatly increased in numbers.

State Game Commissioner E. Z. Jones, in concluding his second annual report, in 1915, had this to say concerning the assistance rendered him by the National and State Audubon Societies:

> The work of the Audubon Societies in the country can hardly be estimated. For several years they have been energetic and spending money in untold amounts for the protection of birds, and that all laws pertaining to the protection of birds have been based upon the results of their work can hardly be questioned. In this report may be found an article, "Florida Bird Life," by the Secretary to the National Association of Audubon Societies, 1974 Broadway, New York City. The members of the Audubon Societies have rendered me great assistance in this State in the enforcement of the laws pertaining to birds, which should be appreciated by the citizens of the State.

The executive head of the National Association of Audubon Societies for the past twenty years has been Dr. T. Gilbert Pearson, whose youth was passed in Florida and who has a deep interest in the wild life of the State.

BIRD REFUGES IN FLORIDA MAINTAINED BY THE NATIONAL ASSOCIATION OF AUDUBON SOCIETIES

Name	*Date established*	*Location*
Orange Lake Rookeries	1911	Orange Lake, Alachua County
Micanopy Rookery	1913	Micanopy, Alachua County
San Sebastian Rookeries	1917	Sebastian River, near Roseland
May's Pond Rookery	1923	May's Pond, Jefferson County
Shark River Rookeries	1930	Shark River, Monroe County
Manofwar Key	1930	Florida Bay
Okeechobee Rookeries	1930	Fish-eating Creek, Glades County
'Gator Lake Rookeries	1930	Alligator Lake, near Cape Sable
Loop Rookery	1930	Tamiami Trail, Monroe County

THE FLORIDA AUDUBON SOCIETY

In March, 1900, several winter residents and other persons of Maitland, Florida, and vicinity, met and formed the Florida Audubon Society, with Bishop H. B. Whipple, of Minnesota, as president. He died not long afterwards and was succeeded by L. F. Dommerich, of New York City, who served until 1912, when he resigned because of failing health. At his death he bequeathed to the National Association of Audubon Societies the sum of $5,000, the income from which was directed to be expended in Florida, perpetually, for the purposes of the society.

In 1902 the society was incorporated under the laws of Florida. It has had a steady and healthy growth; and to-day, with a much increased membership, it is one of the chief agencies of conservation in this State. Dr. William F. Blackman, now honorary president, was for a long period its leader.

During the decade following 1900 the Florida Audubon Society, with its affiliating national and local societies, was virtually the only voice to be heard in Florida for genuine state-wide wild-life conservation. This society may well be credited with the establishment in 1913 of the first State Game Commission in Florida, which, though in

existence only two years, undoubtedly paved the way for the game commissions that have since been established and the one now in such effective operation. Any description of the work and activities of the National Association of Audubon Societies in Florida necessarily includes, in large part, those of the Florida Society, for the State organization has closely coöperated with the National, furnishing funds as well as workers from its membership. It has shared, too, with the National Association the discouragements and triumphs in the great undertaking.

Prior to the establishment of the State Game Commission, and to a considerable extent since, the Florida Society distributed synopses of the Federal and State game and bird protective laws throughout the State, and enlisted the support of many newspapers in its publicity work. It purchased and loaned to schools colored charts of the commoner birds of the State and employed lecturers to instruct the people, especially the children, regarding the value and utility of the birds about them. It distributed large numbers of pamphlets, circulars, and other forms of literature to promote the cause of the birds, made appropriate exhibits at county fairs and elsewhere, and deposited interesting books and other literature on birds in the public libraries of the State. It has given many prizes to children for work in bird study and has organized clubs of school children for promotion of bird study and conservation. The Society procured the observance of Bird Day in many schools, and finally was successful, in coöperation with the Women's Clubs, in procuring the law that requires that half an hour each school week shall be devoted to study of birds and other forms of wild life. In 1913 it obtained the removal of the Robin from the game-bird list and the enactment of a law specially protecting it. It has proposed and encouraged the establishment of several of the State's bird sanctuaries, such as that at Winter Park, and has maintained a watchful eye on proposals of legislation inimical to conservation. With the financial coöperation of the National Association of Audubon Societies it publishes an attractive and instructive quarterly magazine called "The Florida Naturalist," devoted to wild life and its protection, and is now offering bird study as a correspondence course, through the extension division of the University of Florida.

There are also active and efficient local Audubon societies in many cities, including Tampa, Coconut Grove, St. Petersburg, and Daytona Beach. The one at the last-mentioned place, the Halifax River Bird Club, has recently published a useful primer of Florida ornithology, written by R. J. Longstreet, now president of the Florida Audubon Society, entitled "Bird Study in Florida."

Referring to the splendid work of this Society in Florida in the cause of wild-life conservation, State Game Commissioner Jones in his second annual report very appropriately said that it was hard to estimate the value of the work of the Audubon Societies to the State, a work that ought to be appreciated by every citizen.

THE FLORIDA FEDERATION OF WOMEN'S CLUBS

No history of wild-life conservation in Florida would be complete without mention of the work on this line of the Florida Federation of Women's Clubs. To this organization of genuine and outspoken conservationists is due a part of the credit for the existence to-day of the State Game Commission, equipped with powers adequate to the fulfilment

of its functions, and for the law that makes bird study, the beginning and foundation of conservation, a part of the public-school course.

This Federation procured the establishment of and now maintains the Royal Palm State Park, in Dade County, an inviolate sanctuary for wild life, unique in its tropical setting and one of the most interesting areas in this country. For many years the Federation has coöperated closely with the Audubon Societies, aiding and assisting in the dissemination of useful information about wild life and its protection. It has been watchful of measures inimical to wild life and has not been timid in opposing them. It is a powerful factor in the progress of conservation in Florida.

OTHER PROMOTERS OF CONSERVATION

Of more recent origin, but none the less entitled to recognition on the roll of potent forces supporting and working for conservation in Florida, is the Izaak Walton League of America, with its chapters in a number of counties. It has participated in the advocacy of effective laws for the protection of wild life, and through its large membership throughout the State has advocated and practiced those doctrines of true sportsmanship that promise not only present but future enjoyment of wild life. In no inconsiderable measure it has coöperated with the State Game Commission in the enforcement of the laws and in educational undertakings. It is a forceful factor in directing public sentiment conservationwise.

There have been and now are some few local sportsmen's organizations, such as the Crescent City Sportsman's Club in Putnam County and the Highlands County Game Protective Association, that have contributed their quota to the progress of conservation in this State, and reference has already been made in this chapter to the resolution of the Florida Legislature of 1921 regarding the Wild Life Leagues of Lee and Orange Counties.

In some sections of the State the Boy Scouts have rendered excellent and honorable service in the cause. Much of the comparatively recent local county legislation for wild-life protection manifests the presence in those counties of some earnest and devoted protagonists of game conservation. With all these agencies, both official and unofficial, earnestly at work in the great cause of conservation of wild life, and holding steadfast in their faith, the perpetuation of our wild neighbors is reasonably assured.

FIG. 1.—SCRUB VEGETATION ON THE BEACH AT JUPITER

FIG. 2.—SLASH PINES (*Pinus caribaea*) WITH SAW-PALMETTO UNDERGROWTH ON LONG KEY, SOUTHERN EVERGLADES
(*Photo by E. G. Holt*)

FIG. 1.—FRESH-WATER VEGETATION ON PANASOFFKEE LAKE

FIG. 2.—CYPRESS SWAMP ON TAYLOR CREEK, OSCEOLA COUNTY

PHYSIOGRAPHIC REGIONS OF FLORIDA

Although reaching elevations of only about 360 feet, Florida nevertheless exhibits considerable topographic diversity. The topography and vegetation have been treated in detail by Dr. Roland M. Harper (1910, 1914, 1921, 1927) in a series of publications issued by the Florida State Geological Survey. In the first of these papers Doctor Harper listed the natural divisions of the State, as follows:

West Florida Coast Region
West Florida Pine Hills
West Florida Limestone Region
Middle Florida Hammock Belt
Lime-sink Region
Middle Florida Flatwoods
Gulf Hammock Region
Lake Region
East Florida Flatwoods
East Coast Strip
South Florida Flatwoods
Miami Limestone Region
Coast Prairie
The Keys

From the standpoint of bird distribution in Florida, a somewhat different grouping of the prominent physiographic features will better serve present purposes. The regions as here treated are as follows:

Flatwoods
High Pineland
Hammocks
Sand Scrub
Swamps
Everglades
Salt Marshes
Sea Beaches
Prairies
The Keys

FLATWOODS

Probably the most extensive of the physiographic areas here treated are the pine flats, or flatwoods, as they are frequently called. According to Harper, the greater part of the peninsula south of Pasco and Brevard Counties is occupied by this type of forest, and an arm of the same character extends northward on the east coast to the Georgia line. There are smaller areas in northwestern Florida, particularly in Calhoun, Liberty, Franklin, and Wakulla Counties.

The surface is nearly level for long distances, and the soil supports open forests of tall pines (either *Pinus palustris* or *P. caribaea*), usually with a dense undergrowth of saw palmetto (*Serenoa serrulata*), which may be from one to five feet high, and other shrubs, such as myrtle (*Myrica cerifera*), gallberry (*Ilex glabra*), huckleberry (*Gaylussacia* sp.), rosemary (*Ceratiola ericoides*), and hurrah bush (*Pieris nitida*). The ground is wet in spots, and occasional depressions contain ponds in which cypress, black gum (*Nyssa biflora*), and other water-loving trees prevail. Many of these ponds support

also a dense growth of shrubs, and they are then frequently called "bays," or "bayheads."

Bird life in the flatwoods is moderately abundant, the most characteristic species being Bob-whites, Nighthawks, Meadowlarks, Pine-woods Sparrows, Towhees, Pine Warblers, Yellow-throated Warblers, Brown-headed Nuthatches, Flickers, Red-cockaded Woodpeckers, and Bluebirds.

The Miami Pineland (Plate 2) may be included as a division of the flatwoods, although, because of the character of the soil and the difference in latitude, the vegetation is quite different. In this area, which comprises a narrow belt along the southeastern coast from Dania south to Florida City, and on Long Pine Key, there is little sand or other soil, the vegetation growing directly on the limestone rock (Miami oölite), which here outcrops at the surface. Slash pine (*Pinus caribaea*) is the prevailing tree in the forests, which are relatively dense, with a thick undergrowth of saw palmetto and a scattering growth of low shrubs, mostly of tropical species. Small hammocks are interspersed in this pineland. The birds breeding commonly in this area are the Red-bellied and Red-cockaded Woodpeckers, the Southern Crested Flycatcher, the Florida Bluebird, and the Florida Pine Warbler.

HIGH PINELAND

Though less extensive than the flatwoods areas, the high pinelands are found in a large part of the State. This type is best developed, perhaps, in the lake region, which occupies the interior ridge, or "backbone," of Florida, from Clay County south to southern Highlands County. Here occurs a succession of sand hills, the highest of which reach an elevation above the sea of slightly more than 300 feet, clothed chiefly with open forests of longleaf pine and having comparatively few undershrubs. In the depressions are thousands of clear lakes of varying size, mostly with circular outlines (Plate 3). Large tracts in this region are now under cultivation, being planted to groves of oranges and grapefruit.

In western Florida, also, from the Alabama border eastward to Gadsden County, there are extensive areas of rolling, sandy pineland. Bird life is rather scarce on these pine hills, except where hammocks occur. The most characteristic species are the Summer Tanager, the Pine Warbler, and the Yellow-throated Warbler.

HAMMOCKS [1]

Hammock is a term widely used in Florida, but as its meaning is frequently misunderstood by nonresidents, it will be well to define it, quoting from Doctor Harper (1910, p. 217), as a "dense growth of trees other than pines in comparatively dry soil (or at least not wet enough to be called a swamp), in a region where open pine forests predominate. . . . An intermediate condition between hammock and swamp is often called low hammock."

Hammocks of all sizes and of varying composition occur nearly throughout the State. The largest single area of this character is the Gulf Hammock, of Levy County, with similar tracts extending along the Gulf coast from Pasco County northward to Wakulla

[1] Frequently confused with "hummock," a word of entirely different meaning.

FIG. 1.—ROYAL PALM HAMMOCK, IN THE SOUTHERN EVERGLADES

FIG. 2.—CABBAGE PALMS ON COASTAL PRAIRIE NEAR CAPE SABLE. (*Photo by E. G. Holt*)

FIG. 1.—TROPICAL JUNGLE IN ROYAL PALM HAMMOCK, SHOWING A ROYAL PALM AND A WEST INDIAN HOLLY

FIG. 2.—TROPICAL JUNGLE IN ROYAL PALM HAMMOCK, SHOWING TALL FERNS AND LIANAS

County. The surface of these big hammocks is usually level or slightly undulating, though sometimes hilly; the vegetation is dense and of a varied character, comprising pines of several species—cabbage palmetto, cypress, magnolias, oaks, holly, red bay (*Persea borbonia*), and many others.

Smaller hammocks are scattered widely throughout the pine forests of the State, and as a rule bird life is more abundant in them than in the open pine forests. On the prairies small hammocks, composed chiefly of cabbage palmetto, live oak, and black gum, are of frequent occurrence, these furnishing nesting sites for Barred Owls, Red-tailed and Red-shouldered Hawks, Caracaras, Turkey Vultures, Black Vultures, Barn Owls, Florida Crows, and Red-bellied Woodpeckers.

The tropical hammocks of southern Florida are of a different character from the hammocks of the middle and northern parts of the State, being composed very largely of trees and shrubs of West Indian origin. Many of these unusual hammocks along the east coast have been destroyed to make room for town or villa sites, but the largest and best known one—Royal Palm Hammock, or Paradise Key—situated in the southern Everglades, southwest of Homestead, has been preserved and set aside as the Royal Palm State Park (Plates 4 and 5).

Reports on the fauna and flora of this hammock are contained in papers by J. K. Small (1916; 1917, pp. 99–100), W. E. Safford (1919), and the writer (1921). According to Doctor Small, 162 native species of flowering plants and 13 species of ferns are known from the Royal Palm Hammock, and the list of trees found there comprises 46 species. Of these, the most striking are the royal palms, many of which tower above the rest of the jungle to a height of more than 100 feet. Although the great majority of the plants in the Hammock are of tropical origin, no tropical birds are found there. The most abundant breeding species are the Florida Cardinal, the Florida Wren, and the White-eyed Vireo; occurring less commonly are the Southern Pileated Woodpecker, the Chuck-will's-widow, the Yellow-billed Cuckoo, and the Summer Tanager.

On the coastal prairie near the southern tip of the peninsula, numerous dense hammocks occur, containing a great variety of tropical trees, many epiphytic orchids and bromeliads, and an abundance of spiny cactuses climbing over the trees.

SAND SCRUB

Sand scrub is a term applied to a type of vegetation peculiar to Florida that occupies scattered areas of whitish sand in the lake region, a narrow strip along the east coast, and smaller tracts on the west coast from Manatee County south to Collier County. The characteristic plants of the scrub are the sand pine (*Pinus clausa*) and shrubby oaks of several species (*Quercus myrtifolia, Q. geminata, Q. catesbaei*). These oaks, with saw palmetto and rosemary (*Ceratiola ericoides*), form dense and almost impenetrable thickets (Plate 2). The scrub is the chosen home of the Florida Jay, with which are found White-eyed Towhees, Gnatcatchers, and Cardinals.

SWAMPS

The swamps of Florida are numerous and extensive and occur in all parts of the State. The lower courses of the larger rivers on the west coast are bordered for many miles with

heavy swamps of cypress, gum, and other trees; similar areas are found also at many points in the interior, notably the Oklawaha Swamp, in Marion County; the Jane Green Swamp, in Osceola County; the Istokpoga Swamp, on the east and south sides of Istokpoga Lake; and the Big Cypress Swamp, in Collier County. In addition to these there are innumerable smaller swamps scattered throughout the State (Plate 3). On the coasts, from Mosquito Lagoon and Tampa Bay southward, mangrove swamps are of frequent occurrence; and at the southern end of the peninsula, from Marco to Cape Sable and around the shores of Florida Bay to Key Biscayne Bay, there is a nearly continuous series of wet swamps, composed mainly of red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia nitida*), white mangrove (*Laguncularia racemosa*), and buttonwood (*Conocarpus erecta*).

The swamps are usually well populated with bird life. They were the chosen home of the Ivory-billed Woodpecker, and are still inhabited by Pileated Woodpeckers, Red-bellied Woodpeckers, Red-shouldered Hawks, Short-tailed Hawks, and many of the smaller birds, including the Red-eyed and White-eyed Vireos, Parula and Prothonotary Warblers, Acadian Flycatchers, Florida Cardinals, Florida Wrens, and Florida Chickadees. The mangrove swamps harbor Florida Prairie Warblers, Black-whiskered Vireos, and Maynard's Cuckoos.

EVERGLADES

The Everglades of Florida are its most striking topographic feature, but their real character is often misunderstood by those who have never seen them. Probably such pictures as were in the old geographies of a generation ago, showing gloomy forests of cypress with snakes hanging from the branches, are partly responsible for these misconceptions. In reality, the Everglades form a vast, inland fresh-water marsh, filling a basin underlaid with limestone rock, its waters being held by a rock rim, through which only the Caloosahatchee and a few smaller rivers permit drainage to the sea. This remarkable basin occupies an area more than 100 miles long from the southern and eastern shores of Okeechobee Lake to Whitewater Bay and more than 50 miles across at its widest part. The central portion of it is one vast, open expanse of saw grass, with scarcely a tree or a bush to break the monotony, but around the borders and in the southern portion scores of small, low hammock islands occur, bearing numerous shrubs and trees and enough soil to permit the cultivation of crops (Plate 6). At the northern end a deep layer of muck overlies the limestone; but toward the southern end the rock approaches the surface, and one at times can walk with comparative ease through the marsh on a rock bottom.

The digging of numerous drainage canals on the eastern side of the Everglades has resulted in lowering the water level several feet and has permitted the use of the land for agricultural purposes. With these profound changes in the character of the big marsh, many of the birds formerly living there have been driven out. Before the Everglades were drained, they furnished a home for thousands of Florida Ducks, herons, egrets, Limpkins, and Everglade Kites, most of which have been compelled to leave the region entirely. With the extension of the dry land area and the growing of shrubs, trees, and farm crops, other species have penetrated the region, and numbers of Kingbirds,

FIG. 1.—SALT MARSH ON FORT GEORGE ISLAND, DUVAL COUNTY—HABITAT OF WAYNE'S CLAPPER RAIL
(Photo by Francis Harper)

FIG. 2.—EVERGLADES BORDERING LAKE HICPOCHEE

FIG. 1.—FRESH-WATER MARSHES NEAR HEAD OF ST. JOHNS RIVER. (*Photo by D. J. Nicholson*)

FIG. 2.—RIVER SCENE ON THE CALOOSAHATCHEE

Cardinals, White-eyed Vireos, Florida Yellowthroats, Florida Wrens, and Meadowlarks are now seen along the borders of the canals, while Boat-tailed Grackles, Red-winged Blackbirds, and King Rails continue to find favorable nesting sites there, as of old.

Smaller areas of fresh-water marsh, similar to the Everglades, occur in other parts of the State; the most extensive of such tracts lies in Brevard and Indian River Counties, forming the headwaters of the St. Johns River. Here numbers of Limpkins, Everglade Kites, Snakebirds, ibises, and herons have found a safe and congenial home (Plate 7), but recently this area has been drained in part. A vast marsh bordering the north side of Lake Apopka furnishes an ideal breeding place for large numbers of Florida and Purple Gallinules as well as Limpkins and Florida Cranes.

SALT MARSHES

Extensive salt marshes, overflowed daily by the tides, occur along the east coast from Cumberland Sound to Matanzas Inlet, and in Mosquito Lagoon and the Indian River (Plate 6). On the west coast there is a nearly continuous series of salt marshes from Apalachee Bay southward to Charlotte Harbor, while in northwestern Florida similar marshes are found on St. Vincent Island and in St. Andrews, Choctawhatchee, and Pensacola Bays. There are no large marshes on the southern end of the peninsula, their place being taken by mangrove swamps.

The characteristic species of birds living in the salt marshes are Clapper Rails, Seaside Sparrows, and Long-billed Marsh Wrens. The vegetation varies somewhat in different localities. On the east coast it consists of glasswort (*Salicornia*) and switch grass (*Spartina*), in varying proportions, with occasional patches of sharp-pointed rushes (*Juncus*) and scattering mangrove bushes. On the west coast *Juncus* is the principal component, forming sometimes dense and almost impenetrable tangles 4 to 6 feet high.

SEA BEACHES

The sea beaches of Florida support an abundant bird life during the migration seasons and in winter, when large numbers of shorebirds, gulls, terns, cormorants, and pelicans may be seen feeding along the shores. Extensive areas of sea beach backed by sand dunes occur along the east coast from Amelia Island to Miami Beach. These dunes vary in height, some of them reaching an elevation of 60 feet (Sanford, 1909, p. 183). On the west coast, dunes are much less numerous than on the east, and are more irregularly distributed. At Caxambas, on Marco Island, however, is a series of dunes that in places reach a height of 80 feet above sea level. There are no dunes at Cape Sable, but a flat sand beach on which have been planted several large coconut groves. Low sand beaches occur on most of the coastal islands from Sanibel Island north to Anclote Keys, but from that point northward to Apalachee Bay the shores are mostly marshy. Extensive dunes are found on the islands and shores from Lighthouse Point westward to Pensacola Bay.

During the breeding season the characteristic inhabitants of the beaches are Wilson's and Snowy Plovers, Willets, Least Terns, and Black Skimmers, with small numbers of nonbreeding shorebirds, including Knots, Turnstones, Sanderlings, and Semipalmated Sandpipers, and occasionally a few Black-bellied Plovers.

The higher parts of the beaches are clothed with patches of sea-oats (*Uniola paniculata*) and a few low shrubs; back of the dunes a dense jungle of saw palmetto and shrubby oaks is frequently found, in which Towhees, Mockingbirds, Ground Doves, Florida Jays, and a few other land birds make their homes.

PRAIRIES

The largest and best known of the prairies of central and southern Florida is the Kissimmee Prairie, extending from St. Cloud in northern Osceola County southward to Lake Okeechobee and westward to Lake Istokpoga. There is a small prairie west of Melbourne, and large prairie areas in Manatee, Sarasota, De Soto, Charlotte, Glades, and Collier Counties. Small hammocks and clumps of cabbage palmetto are scattered over the prairies, and these merge more or less abruptly into the adjacent flatwoods. The prairie vegetation consists of various grasses, with a stunted growth of saw palmetto and low shrubby oak (*Quercus minima*). The characteristic birds are Nighthawks, Loggerhead Shrikes, Meadowlarks, Burrowing Owls, Caracaras, Red-tailed Hawks, and Florida Cranes. In the prairie hammocks, and wherever there is suitable cover, Mockingbirds, Towhees, Pine-woods Sparrows, and numerous other species are found.

At the southern end of the peninsula, bordering the southern part of Key Biscayne Bay and the shores of Florida Bay, is an area of marl prairie, which is usually more or less wet, being subject to overflow from the waters of the ocean or the Gulf. The vegetation there consists chiefly of a tall growth of switch grass (*Spartina juncea*) with clumps of small bushes and a few cabbage-palm trees. On these prairies Meadowlarks are abundant, and the switch grass areas near Cape Sable are the home of the Cape Sable Seaside Sparrow. Bordering the Gulf at certain points are dense areas of scrubby hammock, made up largely of tropical trees and shrubs, in which Florida Crows and Florida Red-shouldered Hawks are numerous.

THE KEYS

The geological structure of the Florida Keys may be made clear by the following quotation from Sanford (1909, pp. 196–197):

> The shores of the main line of keys, extending from opposite Biscayne Bay to Key West and Boca Grande, in places are rocky, in others are bordered by wide flats of marl or calcareous sand. In places the surface of the keys is bare rock, in others it is sand or marl. Most of the keys have few wide strips of land attaining an elevation of as much as six feet above the highest spring tides.
>
> The longest of the keys, Key Largo, has an extreme length of thirty miles, but is nowhere over three miles wide, and the maximum width of ground above the level of high spring tides is considerably less. Big Pine Key is ten miles long and has an area of high ground nearly two miles wide, with a greatest elevation of thirteen feet; while Key West is four miles long by one mile wide, and the highest ground, which is near the center of the city of Key West, has an elevation of thirteen feet.
>
> A glance at a map of the Florida Keys shows that the islands are separated by Bahia Honda Channel into two distinctly differentiated divisions. East of the channel the islands are narrow and lie along a sweeping arc curved toward the southeast [= southwest]. Outside this arc is the Strait of Florida, inside are the Bay of Florida, Blackwater Sound, Card Sound and Biscayne Bay.
>
> West of Bahia Honda the keys form an archipelago roughly triangular in outline. In this bunch of islands, the westward prolongation of the arc in which lie Bahia Honda and the keys to the east and northeast is found in the southern shore line of the keys, but instead of lying parallel to this arc the keys

themselves have a prevailing north-northwest, south-southeast arrangement, perpendicular to the arc. The causes of this striking dissimilarity in position are twofold, a difference in rock structure and a difference in the direction of the forces which have shaped the islands.

Bahia Honda and the keys east of it represent an uplifted coral reef more or less covered with sand and marl, hence their basement rock ridges have the trend of the coral patches of the old reef. The foundation of the keys west of Bahia Honda is an oolitic limestone formed from deposits in a broad expanse of shallow water; hence there was no original ridge-like upbuilding, no pronounced trend to the rock structure. Variations in resistance to erosion have resulted in irregularities of the rock surface, which, as along the old reef to the east, has been more or less covered with marl and calcareous sand.

Small (1913, p. III), writing of the flora of the Florida Keys, says:

The Upper keys are naturally clothed with a dense hammock growth of tropical hardwood shrubs and trees, and palms; they closely resemble many of the Bahama islands. The Lower keys are more varied in their vegetation, supporting large areas of pineland and palmland, as well as extensive hammocks. Their vegetation indicates close relationship to Cuba, and the pinelands are almost identical with those of the Miami Limestone Region or Everglade Keys. The Lower Sand keys are little more than sand-bars, and they support, like the ocean side of all the Florida Keys, only, or mainly, the characteristic strand-flora of most of the West Indies.

The whole chain is surrounded by tropical waters. The western extension lies in the Gulf of Mexico. . . . The outer side of the reef is swept by the warm waters of the Gulf Stream. Thus we find here a tropical flora made up almost wholly of West Indian elements, and closely related to the floras of Bermuda, the Bahamas, and Cuba.

Following is a list of the principal species of land birds breeding on the Florida Keys:

White-crowned Pigeon (*Columba leucocephala*)
Eastern Mourning Dove (*Zenaidura macroura carolinensis*)
Eastern Ground Dove (*Chaemepelia passerina passerina*)
Maynard's Cuckoo (*Coccyzus minor maynardi*)
Yellow-billed Cuckoo (*Coccyzus americanus*)
Insular Red-shouldered Hawk (*Buteo lineatus extimus*)
Little Sparrow Hawk (*Falco sparverius paulus*)
Florida Screech Owl (*Otus asio floridanus*)
Florida Nighthawk (*Chordeiles minor chapmani*)
Red-bellied Woodpecker (*Centurus carolinus*)
Gray Kingbird (*Tyrannus dominicensis dominicensis*)
Southern Crested Flycatcher (*Myiarchus crinitus crinitus*)
Florida Blue Jay (*Cyanocitta cristata semplei*)
Florida Crow (*Corvus brachyrhynchos pascuus*)
Eastern Mockingbird (*Mimus polyglottos polyglottos*)
Loggerhead Shrike (*Lanius ludovicianus ludovicianus*)
Key West Vireo (*Vireo griseus maynardi*)
Maynard's Red-wing (*Agelaius phoeniceus floridanus*)
Florida Cardinal (*Richmondena cardinalis floridana*)

LIFE ZONES OF FLORIDA

Of the broad transcontinental life zones into which the United States is divided, two are found in Florida. One of these, the Lower Austral Zone, includes the greater part of the State; the other, the Tropical Zone, embraces the Florida Keys and a belt around the southern end of the peninsula. The Lower Austral Zone, in its eastern humid or Austroriparian division, may be subdivided in Florida into the Floridian and Louisianian Faunas. The northern extension of the Tropical Zone is not subdivided in Florida. (Plate 8.)

LOWER AUSTRAL ZONE

The Lower Austral Zone is currently recognized as embracing the greater part of the Gulf States and of the South Atlantic States from southern Virginia to Florida. It is abundantly characterized by a large number of species, of which the following are the most important:

Lower Austral Birds Occurring in Florida [1]

Black Vulture (*Coragyps atratus atratus*)
Purple Gallinule (*Ionornis martinicus*)
Ground Dove (*Chaemepelia passerina passerina*)
Chuck-will's-widow (*Antrostomus carolinensis*)
Red-cockaded Woodpecker (*Dryobates borealis*)
Loggerhead Shrike (*Lanius ludovicianus ludovicianus*)
Swainson's Warbler (*Limnothlypis swainsoni*)
Yellow-throated Warbler (*Dendroica dominica dominica*)
Boat-tailed Grackle (*Cassidix mexicanus major*)
Pine-woods Sparrow (*Aimophila aestivalis aestivalis*)

Lower Austral Mammals Occurring in Florida

Mahogany bat (*Nycteris seminola*)
Evening bat (*Nycticeius humeralis*)
Florida weasel (*Mustela peninsulae*)
Old-field mouse (*Peromyscus polionotus* subspecies)
Cotton mouse (*Peromyscus gossypinus* subspecies)
Southern golden mouse (*Peromyscus nuttalli aureolus*)
Swamp rice rat (*Oryzomys palustris* subspecies)
Cotton rat (*Sigmodon hispidus* subspecies)
Florida wood rat (*Neotoma floridana floridana*)
Florida pocket gopher (*Geomys tuza* subspecies)
Marsh rabbit (*Sylvilagus palustris* subspecies)

Lower Austral Trees and Shrubs Occurring in Florida

Old-field pine (*Pinus taeda*)
Longleaf pine (*Pinus palustris*)
Slash pine (*Pinus caribaea*)
Sand pine (*Pinus clausa*)
Swamp cypress (*Taxodium distichum*)
Pond cypress (*Taxodium ascendens*)
Cabbage palmetto (*Sabal palmetto*)
Saw palmetto (*Serenoa serrulata*)
Water hickory (*Hicoria aquatica*)
Turkey oak (*Quercus catesbaei*)
Water oak (*Quercus nigra*)
Laurel oak (*Quercus laurifolia*)

[1] Additional species listed under Floridian Fauna.

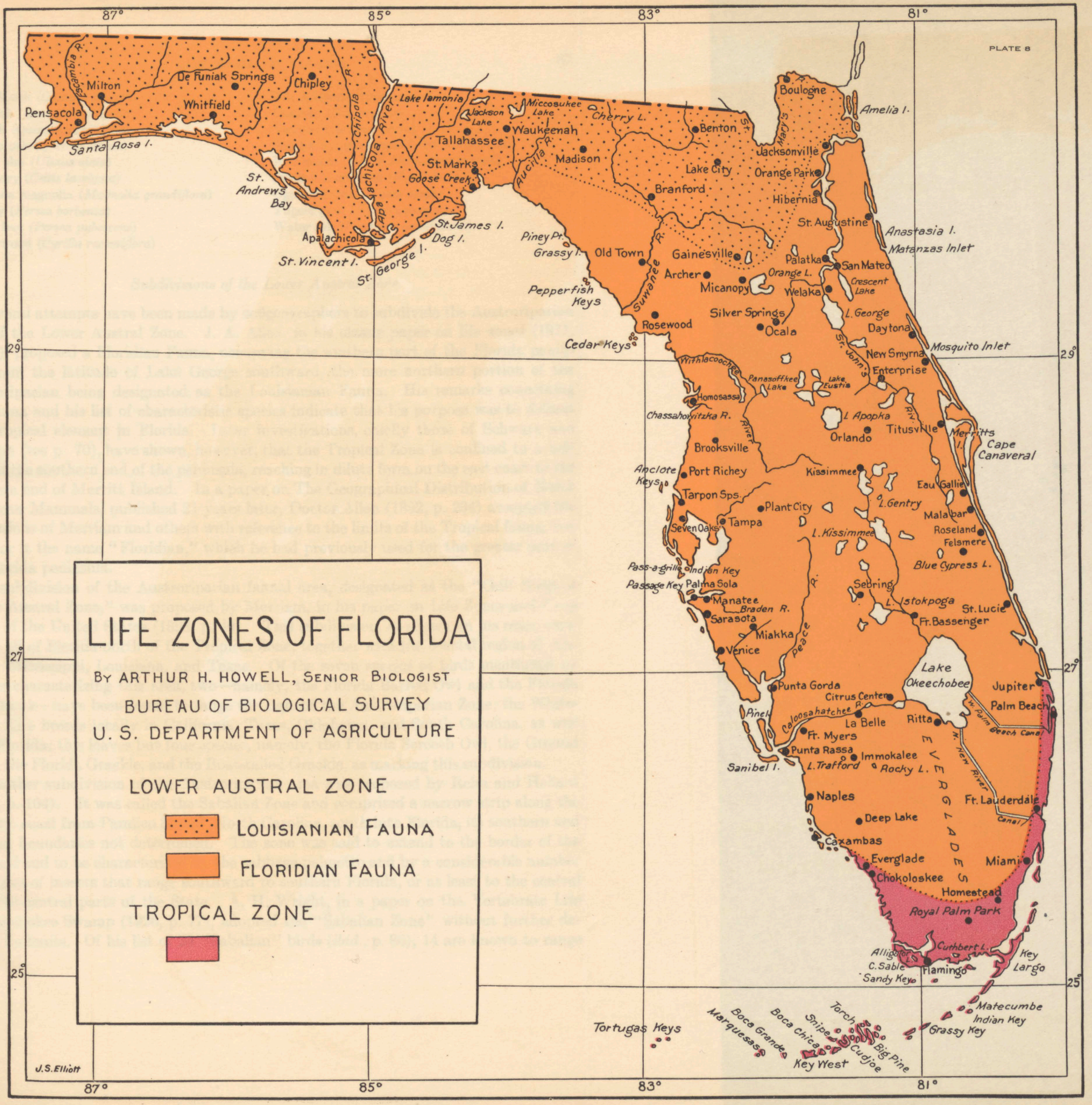
PLATE 8
LIFE ZONES OF FLORIDA
BY ARTHUR H. HOWELL, SENIOR BIOLOGIST
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LOWER AUSTRAL ZONE
LOUISIANIAN FAUNA
FLORIDIAN FAUNA
TROPICAL ZONE
J.S. Elliott
87°
85°
83°
81°
29°
27°
25°
Pensacola
Milton
De Funiak Springs
Chipley
Whitfield
Santa Rosa I.
Escambia R.
Chipola R.
Apalachicola River
Lake Iamonia
Jackson Lake
Miccosukee Lake
Cherry L.
Tallahassee
Waukeenah
St. Marks
Goose Creek
Madison
Auchila R.
St. Andrews Bay
Apalachicola
St. James I.
Dog I.
St. George I.
St. Vincent I.
Piney Pt.
Grassy I.
Old Town
Suwanee R.
Pepperfish Keys
Cedar Keys
Rosewood
Archer
Gainesville
Micanopy
Branford
Lake City
Benton
St. Mary's R.
Boulogne
Amelia I.
Jacksonville
Orange Park
Hibernia
St. Augustine
Anastasia I.
Matanzas Inlet
Palatka
San Mateo
Orange L.
Crescent Lake
Welaka
Silver Springs
Ocala
L. George
Daytona
Mosquito Inlet
New Smyrna
Enterprise
St. John's River
Withlacoochee R.
Panasoffkee Lake
Lake Eustis
Homosassa
Chassahowitzka R.
L. Apopka
Orlando
Titusville
Merritts I.
Cape Canaveral
Brooksville
Anclote Keys
Port Richey
Kissimmee
Tarpon Sps.
Plant City
Tampa
Seven Oaks
L. Gentry
Eau Gallie
Malabar
Roseland
Felsmere
L. Kissimmee
Blue Cypress L.
Pass-a-grille
Indian Key
Passage Key
Palma Sola
Manatee
Braden R.
Sarasota
Miakka
Venice
Peace R.
Sebring
L. Istokpoga
St. Lucie
Fr. Bassenger
Lake Okeechobee
Punta Gorda
Citrus Center
Jupiter
Palm Beach
Pine I.
Caloosahatchee R.
La Belle
Ritta
W. Palm Beach Canal
Fr. Myers
Punta Rassa
Immokalee
Sanibel I.
L. Trafford
Rocky L.
N. New River
EVERGLADES
Naples
Deep Lake
Ft. Lauderdale
Canal
Caxambas
Everglade
Miami
Chokoloskee
Homestead
Royal Palm Park
Cuthbert L.
Alligator
C. Sable
Sandy Key
Flamingo
Key Largo
Matecumbe
Indian Key
Grassy Key
Tortugas Keys
Marquesas
Boca Grande
Boca Chica
Key West
Snipe
Torch
Cudjoe
Big Pine

Bluejack oak (*Quercus cinerea*)
Scrub oak (*Quercus myrtifolia*)
Live oak (*Quercus virginiana*)
Overcup oak (*Quercus lyrata*)
Winged elm (*Ulmus alata*)
Sugarberry (*Celtis laevigata*)
Evergreen magnolia (*Magnolia grandiflora*)
Red bay (*Persea borbonia*)
Swamp bay (*Persea pubescens*)
Leatherwood (*Cyrilla racemiflora*)
Titi (*Cliftonia monophylla*)
Cassena (*Ilex cassine*)
Yaupon (*Ilex vomitoria*)
Southern sugar maple (*Acer floridanum*)
Red maple (*Acer rubrum drummondii*)
Swamp black gum (*Nyssa biflora*)
Ogeechee lime (*Nyssa ogeche*)
Tupelo gum (*Nyssa aquatica*)
Water ash (*Fraxinus caroliniana*)

Subdivisions of the Lower Austral Zone

Several attempts have been made by zoögeographers to subdivide the Austroriparian area of the Lower Austral Zone. J. A. Allen, in his classic paper on life zones (1871, p. 391), proposed a Floridian Fauna, occupying the southern part of the Florida peninsula from the latitude of Lake George southward, the more northern portion of the Austroriparian being designated as the Louisianian Fauna. His remarks concerning this fauna and his list of characteristic species indicate that his purpose was to delimit the Tropical element in Florida. Later investigations, chiefly those of Schwarz and Simpson (see p. 70), have shown, however, that the Tropical Zone is confined to a belt around the southern end of the peninsula, reaching in dilute form on the east coast to the southern end of Merritt Island. In a paper on The Geographical Distribution of North American Mammals, published 21 years later, Doctor Allen (1892, p. 234) accepted the conclusions of Merriam and others with reference to the limits of the Tropical fauna, but used for it the name "Floridian," which he had previously used for the greater part of the Florida peninsula.

A subdivision of the Austroriparian faunal area, designated as the "Gulf Strip of Lower Austral Zone," was proposed by Merriam, in his paper on Life Zones and Crop Zones of the United States (1898, p. 49). This subdivision, as shown on his map, comprised all of Florida north of the Tropical Zone, together with the coastal region of Alabama, Mississippi, Louisiana, and Texas. Of the seven species of birds mentioned by him as characterizing this area, two—namely, the Florida Barred Owl and the Florida Nighthawk—have been found to range throughout the Austroriparian Zone; the White-tailed Kite breeds locally in California, Texas, Oklahoma, and South Carolina, as well as in Florida; this leaves but four species, namely, the Florida Screech Owl, the Ground Dove, the Florida Grackle, and the Boat-tailed Grackle, as marking this subdivision.

Another subdivision of the Austroriparian area was proposed by Rehn and Hebard (1916, p. 104). It was called the Sabalian Zone and comprised a narrow strip along the Atlantic coast from Pamlico Sound, North Carolina, south into Florida, its southern and western boundaries not determined. The zone was said to extend to the border of the Tropical and to be characterized by the cabbage palmetto and by a considerable number of species of insects that range southward to southern Florida, or at least to the central or north-central parts of the State. A. H. Wright, in a paper on the Vertebrate Life of Okefenokee Swamp (1926, p. 77), adopted the "Sabalian Zone" without further defining its limits. Of his list of 23 "Sabalian" birds (*ibid.*, p. 86), 14 are known to range

more or less completely throughout the Austroriparian area,[1] six are mainly Floridian,[2] while only three—the Florida Cormorant, the Ground Dove, and the Florida Grackle—are found throughout the "Sabalian."

Recent field studies in Florida by the writer have led to the conclusion that neither the "Gulf Strip" of Merriam nor the "Sabalian Zone" of Rehn and Hebard can be successfully characterized on the basis of bird distribution. Considering the large assemblage of species of birds and mammals peculiar to the Florida peninsula, it seems desirable to establish a subdivision of the Austroriparian area extending from the latitude of Gainesville in the interior and the mouth of the St. Johns River on the east coast, southward to the edge of the Tropical belt and westward to the Wakulla River. This area may most appropriately be designated the Floridian Fauna, as a portion of it was originally named by Allen. The northern part of the Austroriparian area may be called (following Allen) the Louisianian Fauna.

Birds Mainly Limited in their Southward Range by the Louisianian Fauna

Mississippi Kite (*Ictinia misisippiensis*)
Eastern Bob-white (*Colinus virginianus virginianus*)[3]
Northern Crested Flycatcher (*Myiarchus crinitus boreus*)[3]
Eastern Wood Pewee (*Myiochanes virens*)
Southern Crow (*Corvus brachyrhynchos paulus*)[3]
Carolina Wren (*Thryothorus ludovicianus ludovicianus*)[3]
Wood Thrush (*Hylocichla mustelina*)
Eastern Bluebird (*Sialia sialis sialis*)[3]
Yellow-throated Vireo (*Lanivireo flavifrons*)
Northern Pine Warbler (*Dendroica pinus pinus*)[3]
Yellow-breasted Chat (*Icteria virens virens*)
Hooded Warbler (*Wilsonia citrina*)
Eastern Red-wing (*Agelaius phoeniceus phoeniceus*)[3]
Orchard Oriole (*Icterus spurius*)
Eastern Cardinal (*Richmondena cardinalis cardinalis*)[3]
Indigo Bird (*Passerina cyanea*)
Alabama Towhee (*Pipilo erythrophthalmus canaster*)[3]
Bachman's Sparrow (*Aimophila aestivalis bachmani*)[3]

Birds Mainly Limited in their Northward Range by the Floridian Fauna

Florida Cormorant (*Phalacrocorax auritus floridanus*)[4]
Glossy Ibis (*Plegadis falcinellus*)[4]
Florida Duck (*Anas fulvigula fulvigula*)[4]
Everglade Kite (*Rostrhamus sociabilis plumbeus*)[4]
Short-tailed Hawk (*Buteo brachyurus*)[4]
Florida Red-tailed Hawk (*Buteo borealis umbrinus*)[4]
Florida Bob-white (*Colinus virginianus floridanus*)
Florida Turkey (*Meleagris gallopavo osceola*)
Florida Crane (*Grus canadensis pratensis*)
Limpkin (*Aramus pictus pictus*)[4]
Florida Burrowing Owl (*Speotyto cunicularia floridana*)[4]
Gray Kingbird (*Tyrannus dominicensis dominicensis*)[4]
Southern Crested Flycatcher (*Myiarchus crinitus crinitus*)[4]
Florida Blue Jay (*Cyanocitta cristata semplei*)[4]
Florida Jay (*Aphelocoma coerulescens*)
Florida Crow (*Corvus brachyrhynchos pascuus*)[4]

[1] These are: *Anhinga anhinga, Strix varia alleni, Sturnella magna argutula, Passerina ciris, Helinaia* [=*Limnothlypis*] *swainsoni, Chordeiles virginianus chapmani, Geothlypis trichas ignota, Mycteria americana, Buteo lineatus alleni, Sitta carolinensis atkinsi, Ardea herodias wardi, Falco sparverius paulus, Conuropsis carolinensis,* and *Campephilus principalis.*

[2] *Pipilo erythrophthalmus alleni, Peucaea aestivalis aestivalis, Cyanocitta cristata florincola, Agelaius phoeniceus floridanus, Otus asio floridanus,* and *Grus "mexicana"* [=*pratensis*].

[3] Another race of the species occurs in the Floridian Fauna.

[4] Occurs also in the Tropical Zone.

Florida Chickadee (*Penthestes carolinensis impiger*)
Florida Brown-headed Nuthatch (*Sitta pusilla caniceps*)
Florida Wren (*Thryothorus ludovicianus miamensis*)[1]
Florida Bluebird (*Sialia sialis grata*)[1]
Florida Pine Warbler (*Dendroica pinus florida*)[1]
Florida Prairie Warbler (*Dendroica discolor collinsi*)[1]
Florida Red-wing (*Agelaius phoeniceus mearnsi*)
Florida Cardinal (*Richmondena cardinalis floridana*)[1]
White-eyed Towhee (*Pipilo erythrophthalmus alleni*)[1]
Florida Grasshopper Sparrow (*Ammodramus savannarum floridanus*)
Dusky Seaside Sparrow (*Ammospiza nigrescens*)
Pine-woods Sparrow (*Aimophila aestivalis aestivalis*)

Mammals Mainly Limited in their Northward Range by the Floridian Fauna

Little mole (*Scalopus aquaticus parvus*)
Anastasia Island mole (*Scalopus aquaticus anastasae*)
Florida little shrew (*Cryptotis floridana*)
Florida spotted skunk (*Spilogale ambarvalis*)
East Florida pocket gopher (*Geomys floridanus floridanus*)
West Florida pocket gopher (*Geomys floridanus austrinus*)
East Florida beach mouse (*Peromyscus polionotus niveiventris*)
Anastasia beach mouse (*Peromyscus polionotus phasma*)
Florida old-field mouse (*Peromyscus polionotus rhoadsi*)
Anastasia cotton mouse (*Peromyscus gossypinus anastasae*)
Florida cotton mouse (*Peromyscus gossypinus palmarius*)[1]
Florida white-footed mouse (*Peromyscus floridanus*)
Florida rice rat (*Oryzomys palustris natator*)
Florida cotton rat (*Sigmodon hispidus littoralis*)
Florida pine mouse (*Pitymys parvulus*)
Florida water-rat (*Neofiber alleni*)[1]
Florida cottontail (*Sylvilagus floridanus floridanus*)
Florida marsh rabbit (*Sylvilagus palustris paludicola*)[1]

TROPICAL ZONE

As already shown (p. 67), the presence of a Tropical element in the Florida biota was recognized by Allen in his pioneer paper on zoögeography (1871, p. 392). At that time little accurate information was available as to the distribution of birds in southern Florida, and Doctor Allen was mistaken in supposing that the Tropical fauna extended north to the latitude of Lake George. Schwarz (1888, p. 165), in a paper on the insect fauna of semitropical Florida, showed that this fauna, as well as the flora with which it is associated, is wholly of West Indian origin, and is confined to the southern tip of the peninsula and to small island-like colonies in a narrow belt along the east coast as far north as the southern end of Merritt Island.

Merriam (1890, p. 26, map 5), on his first provisional zone map of North America, indicated the Tropical Zone as a narrow belt around the southern end of the peninsula, reaching about to Merritt Island on the east coast and to Tampa Bay on the west. Allen (1892, p. 234) adopted nearly the same limits for the Tropical area, but designated it as the "Floridian Fauna," which term in 1871 he had proposed for the entire peninsula from Lake George southward. Merriam (1894, pl. 14), in his paper on the Laws of Temperature Control of the Geographic Distribution of Terrestrial Animals and Plants extended the limits of the Tropical Zone to include almost the entire lower half of the Florida peninsula, this modification of his former views being apparently the result of his studies of temperature data in relation to zonal distribution of life.

[1] Occurs also in the Tropical Zone.

The interior of southern Florida south of Okeechobee Lake, occupied mainly by the Everglades, has a distinctly colder climate, however, than the coastal region, which is modified by the proximity of the Gulf Stream. This is shown by a study of the temperature records at Fort Lauderdale in comparison with those at Davie, a settlement on the eastern edge of the Everglades about 8 miles from the coast. The mean temperature at Fort Lauderdale during January and February (the coldest months) for 8 years was 69.5 Fahrenheit, and that at Davie for the same period, 65.9. Furthermore, freezing temperatures were recorded at Davie 9 times in the 8 years and only once at Fort Lauderdale. The actual minimum temperature at Fort Lauderdale was 32 degrees, at Davie, 23 degrees. A similar difference is shown by comparison of the temperature records at Hypoluxo on the east coast with those at Moore Haven, on the western side of Lake Okeechobee. The average temperature at Hypoluxo during January and February for 21 years was 66.9 Fahrenheit, and that at Moore Haven during the same months for 7 years was 64.4 Fahrenheit.

Although the Everglades region is colder than the east coast belt, the climate of a narrow belt on the eastern and southern shores of Lake Okeechobee is much modified by the waters of the lake, which serve materially to temper the cold northerly winds that periodically sweep across the peninsula. Temperature records kept at Ritta, on the south shore of the lake, for a period of 7 years show an average for January and February of 65.5—about one degree higher than at Moore Haven—with freezing temperatures only twice in the period.

As has been pointed out by Schwarz (1888, p. 165) and Simpson (1920, pp. 143–166), the Tropical elements in the biota of southern Florida were derived from the West Indies, probably brought on driftwood by the Gulf Stream, aided by hurricane winds, and deposited on the southern, and particularly the southeastern, shores of the peninsula. This applies to insects, land snails, and plants of the region, in all of which groups is found a preponderant West Indian element. Both of these authors emphasize the fact that the Tropical biota of Florida is confined to a narrow belt along the southern coasts, reaching farther north on the east coast than on the west, but in its northward extension occurring in isolated hammocks on the coastal dunes and becoming more dilute at its northern limit. Simpson (1924, pp. 206–208) enumerates 43 species of Tropical trees and shrubs growing wild on Merritt Island but states that so far as known "the flora of the mainland opposite the island is warm temperate."

The spread of Tropical plants across the peninsula is hindered or prevented by the colder winter climate of the interior and by the physical conditions in the Everglades.[1] Near the southern tip of the peninsula, where the climate is mildest, many of these Tropical species have spread across the State, wherever they could obtain a foothold. Hence, scattered through the southern Everglades are numerous hammocks, many of them very small, others of considerable size, composed chiefly of Tropical trees. The

[1] The following quotation from E. A. Bessey (Plant World, vol. 14, p. 275, 1911) emphasizes this point: "When the Everglades are submerged the danger from freezing is absent; indeed when the water is high even the adjoining pine lands are to some extent protected from frost. Usually, however, the winter is the season for low water, so that it happens that very severe frosts strike the Everglades. Hence it is that strictly tropical forms are lacking."

largest of these hammocks—Royal Palm Hammock, or Paradise Key—situated about 12 miles southwest of Homestead, and containing about 400 acres, consists of a dense jungle of trees, shrubs, ferns, and climbing vines, unlike any other of the North American forests. Dr. J. K. Small, who has studied this flora intensively, states that this hammock contains 162 species of flowering plants (46 of which are trees) and 13 species of ferns, the great majority of which are of Tropical origin. The hammock flora at Cape Sable and on the Florida Keys is, of course, more strictly Tropical in character than that of the mainland to the northward.

Notwithstanding this strong Tropical element in the flora, and in the insect and molluscan faunas, a study of the avifauna of southern Florida reveals only a small number of species restricted to the Tropical Zone. Of these, the following are mainly confined in the breeding season to the Florida Keys:

Birds of the Tropical Zone in Florida

Noddy Tern (*Anoüs stolidus*)
Sooty Tern (*Sterna fuscata*)
Mangrove Clapper Rail (*Rallus longirostris insularum*)
Insular Red-shouldered Hawk (*Buteo lineatus extimus*)
Great White Heron (*Ardea occidentalis*)
Key West Bob-white (*Colinus virginianus insulanus*)[1]
White-crowned Pigeon (*Columba leucocephala*)
Key West Vireo (*Vireo griseus maynardi*)

Three species—Maynard's Cuckoo (*Coccyzus minor maynardi*), Maynard's Red-wing (*Agelaius phoeniceus floridanus*), and the Black-whiskered Vireo (*Vireo calidris barbatulus*) breed both on the Keys and on the mainland. The Cape Sable Seaside Sparrow (*Ammospiza mirabilis*) is endemic, and confined to a very limited area near Cape Sable.

The following species are of Tropical origin, but on the Florida mainland they extend their range into the Austroriparian area:

Limpkin (*Aramus pictus pictus*)
Everglade Kite (*Rostrhamus sociabilis plumbeus*)
Short-tailed Hawk (*Buteo brachyurus*)
Gray Kingbird (*Tyrannus dominicensis dominicensis*)

Mammals of the Tropical Zone in Florida

Chokoloskee raccoon (*Procyon lotor marinus*)[2]
Matecumbe raccoon (*Procyon lotor inesperatus*)[2]
Key Vacas raccoon (*Procyon lotor auspicatus*)[2]
Torch Key raccoon (*Procyon lotor incautus*)[2]
Mangrove fox squirrel (*Sciurus niger avicennia*)
Everglade rice rat (*Oryzomys palustris coloratus*)
Cape Sable cotton rat (*Sigmodon hispidus spadicipygus*)
Island cotton rat (*Sigmodon hispidus exsputus*)
Island deer (*Odocoileus virginianus clavium*)
Florida manatee (*Trichechus latirostris*)

One Tropical reptile, the crocodile (*Crocodylus acutus*), occurs sparingly on the southern and southeastern coasts of the peninsula.

The small number of Tropical birds and mammals occurring in southern Florida is, of course, due to the small size of the Tropical area and to its isolation from continental areas of the same zone. Neither birds nor mammals are as likely to be carried by winds

[1] Probably extinct.
[2] Recently described by Nelson (Smiths. Misc. Coll., vol. 82, no. 8, July 10, 1930).

or currents from the West Indian islands to southern Florida as are insects and plants, and it seems doubtful whether any of the Florida species have become established by those agencies, except possibly the Mangrove Cuckoo and the Black-whiskered Vireo. The Sooty and Noddy Terns, White-crowned Pigeon, Mangrove Cuckoo, and the Black-whiskered Vireo regularly migrate southward in winter; the Great White Heron, Clapper Rail, Red-shouldered Hawk, Maynard's Red-wing, and the Cape Sable Seaside Sparrow are nonmigratory; the Ani and Zenaida Dove are accidental stragglers, though the latter bred in Florida in former times.

It is difficult to fix the limits of the Tropical Zone in Florida, and it must be done largely on data concerning the distribution of tropical plants. The area indicated as Tropical on the map of the life zones of Florida (Plate 8) is the region in which West Indian species of plants predominate; as previously stated, small isolated areas of Tropical hammock are found farther north on both coasts and on the southern shore of Okeechobee Lake. The Black-whiskered Vireo and Maynard's Cuckoo range and breed northward on the west coast to Anclote Keys, and Maynard's Red-wing probably breeds locally in the Everglades.

The Principal Tropical Trees Occurring in Southern Florida[1]

Thatch palm (*Thrinax floridana*)
Silver palm (*Coccothrinax argentea*)
Royal palm (*Roystonea regia*)
Coconut (*Cocos nucifera*)
Florida trema (*Trema floridana*)
Pigeon plum (*Coccolobis laurifolia*)
Pisonia (*Pisonia rotundata*)
Blolly (*Torrubia longifolia*)
Pond-apple (*Annona glabra*)
Coco-plum (*Chrysobalanus icaco*)
West Indian cherry (*Laurocerasus myrtifolia*)
Cats-claw (*Pithecolobium unguis-cati*)
Black-bead (*Pithecolobium guadalupensis*)
Wild tamarind (*Lysiloma bahamensis*)
Jamaica dogwood (*Ichthyomethia piscipula*)
Coralbean tree (*Erythrina arborea*)
Locustberry (*Byrsonima lucida*)
Yellow-wood (*Zanthoxylum flavum*)
Paradise tree (*Simarouba glauca*)
Gumbo-limbo (*Elaphrium simaruba*)
Mahogany (*Swietenia mahogoni*)
Guiana plum (*Drypetes lateriflora*)
Crabwood (*Gymnanthes lucida*)
Manchineel (*Hippomane mancinella*)
Poisonwood (*Metopium toxiferum*)
West Indian holly (*Ilex krugiana*)
Soapberry (*Sapindus saponaria*)
Red ironwood (*Reynosia septentrionalis*)
Wild cotton (*Gossypium hirsutum*)
Lancewood (*Ocotea catesbyana*)
Tetrazygia (*Tetrazygia bicolor*)
White stopper (*Eugenia buxifolia*)
Ironwood (*Eugenia confusa*)
Long-stalked stopper (*Anamomis longipes*)
Myrtle-of-the-river (*Calyptranthes zuzygium*)
Joe-wood (*Jacquinia keyensis*)
Satin-leaf (*Chrysophyllum olivaeforme*)
Mastic (*Sideroxylon foetidissimum*)
Bustic (*Dipholis salicifolia*)
Fiddlewood (*Citharexylum fruticosum*)
Whitewood (*Schoepfia chrysophylloides*)
Princewood (*Exostema caribaeum*)
Velvet-seed (*Guettarda elliptica*)
Bahaman wild-coffee (*Psychotria bahamensis*)

[1] Small's Flora of the Florida Keys, from which this list is selected, describes more than 600 species of plants found on the Keys, of which about 170 are trees or shrubs.

THE BIRDS OF FLORIDA

LOONS: Family Gaviidae

COMMON LOON: *Gâvia immer immer* (Brünnich)

Other Name: Great Northern Diver

Recognition Marks.—About the size of a small goose (length, 28 to 36 inches; spread, 52 to 58 inches). *Summer plumage:* Head, neck, and throat blackish, glossed with green and purple; a band of narrow white stripes on the throat and a longer band of same on the neck; back black, with large squarish white spots. *Winter plumage:* Back fuscous, with broad grayish edgings to the feathers; head and neck sooty drab above; throat and under side of neck whitish. (Plate 9.)

Range.—Breeds from northwestern Alaska, northern Mackenzie, and Greenland south to Connecticut, northern Pennsylvania, Ohio, Indiana, northern Illinois, Iowa, and northern California. Winters mainly within the United States, from northern New England and the Great Lakes south to Florida, the coasts of Louisiana and Texas, and Lower California.

Distribution in Florida.—The Common Loon occurs as a winter resident in the coastal waters of Florida and occasionally on the larger lakes. It is most numerous in the northern part of the State and is rather rare south of Charlotte Harbor. One was seen at Cape Sable, March 29, 1902 (Howe, 1903c, p. 41), and one at Coconut Grove, by F. M. Chapman, February 3, 1925.

Migrants from the North arrive usually between October 20 and November 1, and remain until the first of May, and sometimes later. I saw two Loons in winter plumage in the Halifax River, near Port Orange, May 25, 1925; Weston reports single birds seen at Pensacola on June 15 and 16, 1916, and one in full breeding plumage, August 28, 1921. These summer records, however, are probably of barren or wounded birds that neglected to make the customary northward migration.

At St. Andrews Pass, February 11, 1920, Barrett counted 30 Common Loons around his anchored boat. In Palma Sola Bay, December 4, 1910, Miss Eleanor Earle, while on a trip to Passage Key, saw 100 or more. In the Gulf near the shore of Santa Rosa Island, numbers of the birds were seen by us on April 18 and 19, 1926. Helmuth (1920, p. 258) observed more than 200 in the harbor of Pensacola, March 18, 1918, all swimming in a compact body in one direction. R. J. Longstreet reported that dozens were washed up on the beach near Daytona during the winter and spring of 1925, their feathers clogged with oil. The species has been recorded also from Palm Beach, Fort Lauderdale, Cape Romano, and other points on the coast, and from Orlando, Gainesville, and Tallahassee in the interior.

Haunts and Habits.—During the winter season Common Loons may be found, singly or in scattered flocks, in the bays and lagoons along the coasts of Florida, as well as in the Gulf and on the ocean. Usually they are wary, and at the approach of a boat dive and swim a long distance under water. Their weird laughing notes are sometimes heard at this season.

FOOD.—The Loon feeds chiefly on fish. Thirty-five stomachs have been examined in the Biological Survey, and all but 4 contained fish remains. Much of this material was so mutilated as to be unrecognizable, but in a few cases the contents were identified as mullet, pickerel, horned pout, smelt, black bass, a large minnow, one of the surf fishes (*Cymatogaster aggregatus*), and 7 killifishes (*Fundulus heterocletus*). Commercial food fishes furnished about 11 per cent of the total food of the 35 birds examined, nonedible varieties comprised 20 per cent, and about 47 per cent was made up of unrecognized fish bones, scales, and flesh. Crabs were eaten by five birds, and crawfishes by three. A Loon taken in Pensacola Bay in April, 1926, had in its throat a menhaden (*Brevoortia patronus*) about 4 inches long.

RED-THROATED LOON: *Gâvia stellâta* (Pontoppidan)

RECOGNITION MARKS.—Smaller than the Common Loon (length, 24 to 27 inches; spread, about 44 inches); bill slenderer, slightly concave at nostrils, and appearing upturned, even at a great distance (Griscom). *Winter plumage:* Head and back of neck neutral gray; back fuscous, the feathers with *narrow* white edgings; throat and under side of neck white, faintly mottled with dusky.

RANGE.—Breeds in the northern parts of the Northern Hemisphere; in America, from northern Alaska, Ellesmere Land, and northern Greenland south to Queen Charlotte Islands, Great Slave Lake, the St. Lawrence River, and Bay of Fundy. Winters on the Atlantic coast from the Gulf of St. Lawrence to Florida, on the Pacific coast from the Aleutian Islands and Puget Sound to Lower California, and on the Great Lakes.

DISTRIBUTION IN FLORIDA.—Occurs rather uncommonly in winter, chiefly in the northern half of the State. Worthington noted the bird occasionally throughout the winter of 1905–6 at Amelia Island, and took specimens on February 13 and 19, 1906. The last one seen by him that season was on April 20, and in the fall of the same year, the first migrant appeared there on November 17. The most southerly record in Florida is that of a specimen recorded by Howe (1903c, p. 41) in the winter of 1899 from Lemon City. On the Gulf coast, the bird has been reported by Scott (1888c, p. 374) as not infrequent in December and January near the mouth of the Anclote River; one was taken in February, 1880, near Clearwater Harbor.

HAUNTS AND HABITS.—The Red-throated Loon during its stay in the South is found chiefly on the ocean and in the Gulf. It is with difficulty distinguished from the Common Loon, which it much resembles in habits. It is said to rise more easily from the water than the Common Loon, however, and to get under way more quickly. Its call note is described as a gooselike, honking cry (Bent).

GREBES: FAMILY COLYMBIDAE

HOLBOELL'S GREBE: *Colýmbus grisegéna hólboelli* (Reinhardt)

OTHER NAME: Red-necked Grebe

RECOGNITION MARKS.—About the size of the Red-breasted Merganser (length, 18 to 20 inches; spread, 30 to 32 inches); neck long and slender; head and neck bent slightly downward in flight (Griscom). *Breeding plumage:* Neck cinnamon-rufous; throat and cheeks pale smoke gray. *Winter plumage:* Throat whitish; cheeks dull gray; the neck chiefly drab or fuscous; two white wing patches show in flight (Forbush).

RANGE.—Breeds in northern North America and northeastern Asia; in America, from northern Alaska and Mackenzie south to Washington, North Dakota, southern Minnesota, and New Brunswick. Winters on the Atlantic coast from Maine to North Carolina, and rarely to Florida; on the Pacific coast from the Aleutian Islands and southern British Columbia to southern California; and on the Great Lakes.

DISTRIBUTION IN FLORIDA.—Holboell's Grebe occurs in Florida only as a rare winter visitor. S. R. Ingersoll reports a pair seen in the Halifax River, April 8, 1918, and single birds on February 11 and 22, 1922, and December 6, 1923. F. M. Chapman observed an immature bird with tar on its feathers at Coconut Grove, January 15, 1925. Three were seen by Bayard H. Christy on March 4, 1927, on the Indian River south of Fort Pierce. A. H. Helme states that he has observed this species in Florida on four occasions—at Pepperfish Keys, March 9, 1907; in Wakulla Bay, near St. Marks, March 13, 1907; and near Cedar Keys, January 20 and February 6, 1909.

HAUNTS AND HABITS.—This Grebe is found mainly in the salt-water bays along the coasts. It is an expert diver, obtaining all its food under water; when pursued, it escapes usually by swimming rapidly away, or in some cases by diving. It is able also to sink its body deeply, so that only its head is above water. It can not take flight from the land, but in rising from the water uses both feet and wings to assist it in getting under way, and when fairly launched flies swiftly and strongly a few feet above the water, with its long neck stretched out straight and its feet projecting behind like a rudder.

FOOD.—Wetmore, who has studied the food of grebes (1924, p. 7), finds that about half the food of this species consists of fishes, chiefly of species of no commercial value; one-fifth of the food in the 36 stomachs examined was composed of crustaceans, and 21.5 per cent of insects.

HORNED GREBE: *Colýmbus aurítus* Linnaeus

OTHER NAMES: Hell Diver; Little White Diver

RECOGNITION MARKS.—About the size of a small duck (length, 12 to 15 inches; spread, about 24 inches); much smaller than Holboell's Grebe; bill slender. *Winter plumage:* Throat and cheeks pure white, conspicuous; a large white wing patch.

RANGE.—Breeds in the northern parts of the Northern Hemisphere; in North America, from central Alaska and northern Mackenzie south to southern British Columbia, southern Wisconsin, northern Nebraska, Ontario, and Maine. Winters along the entire Atlantic coast from Maine to Florida and along the Gulf coast to Louisiana; on the Pacific coast, from southern Alaska to southern California; and on the Great Lakes.

DISTRIBUTION IN FLORIDA.—The Horned Grebe is a common winter resident in the northern half of Florida, from late in October or early in November (earliest date recorded October 20, at St. Marks) to April 21 (St. Marks); it ranges south on both the east and west coasts commonly to Merritt Island and Sarasota Bay, respectively, but is rare in southern Florida. M. S. Crosby noted six at Fort Pierce, February 14, 1924, and one at Key Largo, February 13, 1926.

R. J. Longstreet reports the species in the Halifax River, near Daytona, where it was seen nearly every day from January 4 to March 2, 1924. Weston states (Bird-Lore, 1925, p. 116) that it "occurs regularly [at Pensacola] in flocks of a dozen or twenty and can sometimes be seen in close flocks numbering 300 to 400 individuals." Scott (1888c,

p. 373) found it abundant in December, 1887, and January, 1888, in large flocks in the Gulf from 1½ to 3 miles off the coast of Hillsborough and Pasco Counties. It has been reported from Pensacola, De Funiak Springs, Lake Jackson, Choctawhatchee Bay, St. Andrews Bay, Lake Wimico, Fernandina, Green Cove Springs, Titusville, and Charlotte Harbor.

HAUNTS AND HABITS.—As indicated by the records here given, these little Grebes, during their stay in the South, live mainly in the salt-water bays and inlets and in the shallower parts of the Gulf near shore. They occur usually in loose flocks, riding the waves buoyantly and diving every little while in their search for food. Although not particularly shy, when approached too closely they seek safety by diving, or sometimes by taking flight. When the wind is strong and the water rough, these birds rise with some difficulty, their hinder parts seeming to bump the waves repeatedly before they gain sufficient momentum to clear the water. They fly rapidly, with neck extended.

FOOD.—Wetmore, summarizing the food of this species, says (1924, p. 13):

> Nearly one-third of the food of the horned grebe is made up of fishes, one-sixth of crustaceans, and approximately one-half of insects. Though fishes form an important item in the diet, especially in the case of birds taken during fall and winter, most of the species eaten are of no particular value for human food. Crawfishes form an important source of food, and in destroying them the horned grebe does a certain amount of good. Some of the shrimps taken are palatable to man, but are not present in great numbers in the grebe stomachs studied. The insects eaten represent varied groups, part of them aquatic in habit and part individuals that by chance have fallen into the water. When these facts are carefully considered, the horned grebe can not be called injurious in any way. As a harmless species it merits protection for the small amount of good it may do in destroying crawfishes.

PIED-BILLED GREBE: *Podilýmbus pódiceps pódiceps* (Linnaeus)

OTHER NAMES: **Hell Diver; Didapper; Dabchick; Water-witch**

RECOGNITION MARKS.—About the size of the Horned Grebe (length, 12 to 15 inches; spread, 22 to 24 inches), but bill shorter and thicker, the upper mandible curved at tip and having a black band across the middle (in summer). *Summer plumage:* Neck and cheeks drab-gray, chin and throat black. *Winter plumage:* Neck and cheeks pale snuff brown; chin and throat white; *no* white wing patch. (Plate 34.)

RANGE.—Occurs nearly throughout North America, breeding in suitable situations from central British Columbia and Great Slave Lake south to Florida, Texas, and parts of Mexico. Winters from southern British Columbia and New York southward.

DISTRIBUTION IN FLORIDA.—Occurs in winter in considerable numbers throughout the State, and breeds locally, mainly in the northern part. Small numbers were noted at Royal Palm Hammock, Florida City, and Cape Sable in January and February, 1918. B. H. Christy frequently observed them along the Tamiami Trail in the southern Everglades in February, 1927, and reported them abundant on the shores of Lake Okeechobee in March. I found them common in groups of two to five along the Trail, December 4, 1928. Migrating individuals occasionally strike the lighthouses along the coast, as happened at Cape Canaveral, September 28, 1902, and at Warrington, March 22 to 26, 1885.

Longstreet noted the species on the Halifax River ten times between January 10 and March 29, 1925, but has seen it there in summer only once—August 29, 1925. Weston reports it as an abundant winter resident at Pensacola, arriving about September

28 (1928) and leaving in mid-April (latest date of departure, April 18, 1926). H. L. Stoddard observed a thousand or more on Lake Jackson, January 7, 1928.

This Grebe has been reported breeding at Tallahassee, Waukeenah, Archer, Gotha, Seven Oaks (near Clearwater), and Sarasota Bay. Eggs have been found at Seven Oaks, April 12 and May 4, 1903; Gainesville, May 2, 1924; Jacksonville, May 25, 1930; Orlando, June 16, 1930; 10 miles east of New Port Richey, June 17, 1930; and Forest City, September 7, 1930; and young birds at Valrico, Hillsborough County, March 15, 1925; and at Hialeah, Dade County, December 18, 1922 (H. H. Bailey, 1925a, p. 2).

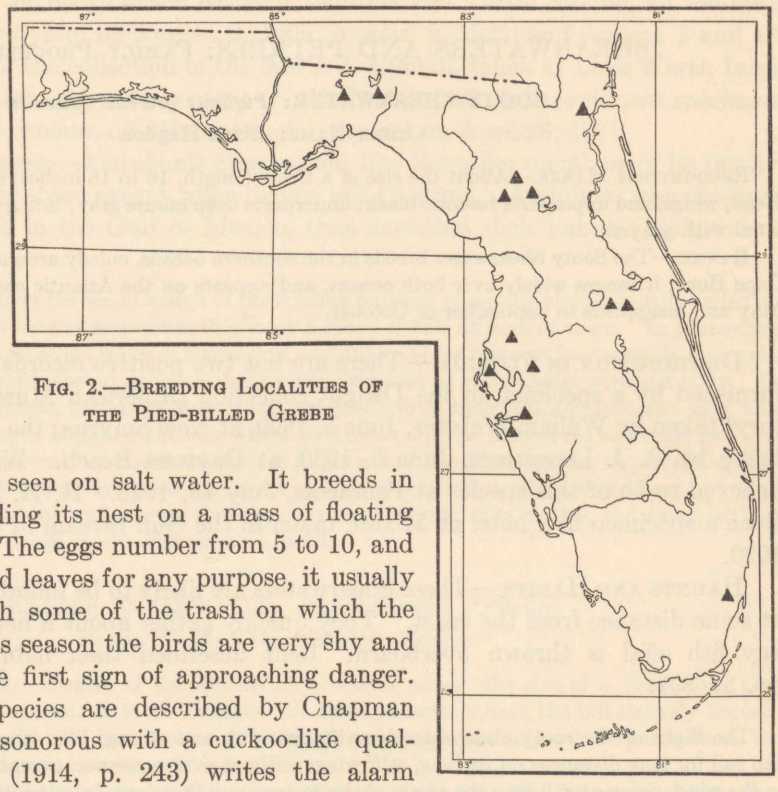

FIG. 2.—BREEDING LOCALITIES OF THE PIED-BILLED GREBE

HAUNTS AND HABITS.—The Pied-billed Grebe is a lover of freshwater ponds and rivers, and is rarely seen on salt water. It breeds in marshy ponds, building its nest on a mass of floating marsh vegetation. The eggs number from 5 to 10, and when the parent bird leaves for any purpose, it usually covers the eggs with some of the trash on which the nest is built. At this season the birds are very shy and leave the nest at the first sign of approaching danger. The notes of this species are described by Chapman as "very loud and sonorous with a cuckoo-like quality." A. A. Allen (1914, p. 243) writes the alarm note as *keck, keck*, which he says changes to a softer *cup, cup*, when calling the young.

In winter these Grebes are found in many of the lakes, rivers, and ponds of Florida. Ordinarily they are not very shy, depending for safety on their remarkable ability to dive with lightning speed and remain under water for long periods. Sometimes they sink gradually beneath the surface and come up again some distance away with only the bill exposed. They seldom take wing, but are capable of swift and sustained flight. In rising, they run along the surface for some distance, beating the water with their paddles. In the Chassahowitzka River I once saw one holding a minnow in its bill, preparing to swallow it, when a fish made a rush and tried to take it away; the Grebe, however, held on to its breakfast, running a few yards on the surface before swallowing it.

FOOD.—Examination of 174 stomachs of this species in the Biological Survey showed the food to consist of fishes, 24 per cent; crawfishes, 27 per cent; and insects, 46 per cent. Among the fish identified were catfishes, eels, perch, sunfishes, suckers, carp, and min-

nows, the majority being of slight economic importance. The destruction of large numbers of crawfishes is distinctly in the birds' favor and more than offsets any damage to the fishing industry. Among the insects eaten were water bugs, water boatmen, whirligig beetles, water scavenger beetles, dragon flies, and grasshoppers. As in other species of grebes, large quantities of feathers were found in the stomachs, amounting in this species to more than half of the total contents. (Wetmore, 1924, pp. 19–23.)

SHEARWATERS AND PETRELS: Family Procellariidae

SOOTY SHEARWATER: *Púffinus gríseus* (Gmelin)

Other Name: **Black Hagdon**

Recognition Marks.—About the size of a Crow (length, 16 to 18 inches; spread, 40 to 42 inches). Head, wings, and upperparts fuscous-black; underparts deep mouse gray; lining of wings white, vermiculated with grayish.

Range.—The Sooty Shearwater breeds in the southern oceans, chiefly around New Zealand and near Cape Horn; it ranges widely over both oceans, and appears on the Atlantic coast of North America in May and disappears in September or October.

Distribution in Florida.—There are but two positive records from Florida; one is furnished by a specimen in the Dwight collection (American Museum of Natural History) taken by William Webster, June 5, 1899, at New Smyrna; the other, by a specimen taken by R. J. Longstreet, June 5, 1930, at Daytona Beach. Weston saw two birds believed to be of this species at Pensacola, July 18, 1926. H. H. Bailey (1931d) mentions a specimen in a hotel at Miami, taken in the Gulf Stream in the spring of 1919 or 1920.

Haunts and Habits.—These Shearwaters are likely to be found on the fishing banks at some distance from the coast. They quickly gather about a fishing vessel whenever any fish offal is thrown overboard. Bent described their habits as follows (1922, pp. 87–89):

> The flight of the sooty shearwater is swift, graceful, and strong; like other species of *Puffinus*, it can sail for long distances on its long, stiff wings without even a tremor, except to adjust them slightly to the wind, rising at will over the crests of the waves or gliding down into the valleys between them and turning as the albatrosses do by lowering the wing on the inner side of the curve and raising the wing on the outer side. . . . It swims lightly and swiftly on the surface and dives below it occasionally in pursuit of food, using its wings freely under water. . . . When a morsel of food is discovered the bird plunges awkwardly down onto the water, striking on its breast with a great splash and gulping down the savory morsel with eager haste. Occasionally it plunges beneath the surface to catch a sinking bit of flesh and often great squabbles take place between several birds, struggling to secure the same pieces and making the water fly in their greedy eagerness.

AUDUBON'S SHEARWATER: *Púffinus lherminieri lherminieri* Lesson

Recognition Marks.—Smallest of the Shearwaters (length, 11 inches; spread, 20 inches). Upperparts and wings fuscous or fuscous-black; lowerparts white, this color reaching nearly to the eye on side of head.

Range.—Occurs in the warmer parts of the western North Atlantic Ocean, breeding in Bermuda, the Bahamas, and Lesser Antilles, and ranging north casually to Long Island.

DISTRIBUTION IN FLORIDA.—Audubon (1835, vol. 3, p. 620) reported this bird from the coasts of Florida, having observed a flock "in the waters of the Gulf Stream opposite Cape Florida" and numbers of them in the Gulf of Mexico.[1] A specimen collected by Deppe at Cape Florida and recorded as being in the Berlin Museum (Hartlaub and Finsch, 1872, p. 112) is the type of *Puffinus audubonì*, which name, however, proves to be antedated by *P. lherminieri*. R. J. Longstreet (1926b, p. 378) furnishes four records of this species from the ocean beach between Daytona and Turtle Mound, all the birds being either dead or dying, on August 9, 1909, August 9, 1925, and August 5 and 13, 1928. A specimen in the collection of the late J. J. Ryman, taken at Lake Worth Inlet, about 1916, was examined by the writer. H. H. Bailey (1931d) records two specimens captured in the Gulf Stream, off Miami Beach—the last on April 28, 1931.

HAUNTS AND HABITS.—Audubon's Shearwater, like the other members of its family, is rarely seen near the shore except when driven in by storms. Audubon, who observed numbers of the birds in the Gulf of Mexico, thus describes their habits (1835, vol. 3, p. 620):

> They skim very low over the sea in search of the floating bunches of marine plants, usually called the Gulf Weed, so abundant here as sometimes to occupy a space of half an acre or more. In proceeding, they flap their wings six or seven times in succession, and then sail for three or four seconds with great ease, having their tail much spread and their long wings extended at right angles with the body. On approaching a mass of weeds, they raise their wings obliquely, drop their legs and feet, run as it were on the water, and at length alight on the sea, where they swim with as much ease as ducks, and dive freely, at times passing several feet under the surface in pursuit of the fishes, which, on perceiving their enemy, swim off, but are frequently seized with great agility. Four or five, sometimes fifteen or twenty of these birds, will thus alight, and, during their stay about the weeds, dive, flutter, and swim, with all the gaiety of a flock of ducks newly alighted on a pond.

GREATER SHEARWATER: *Púffinus grâvis* (O'Reilly)

OTHER NAMES: **Hag; Haglet; Hagdon**

RECOGNITION MARKS.—Largest of the Florida Shearwaters; about the size of a Ring-billed Gull (length, 18 to 20 inches; spread, 42 to 45 inches). All the Shearwaters have the bill strongly hooked. Upperparts fuscous, shaded with hair brown; an indistinct paler collar on nape; underparts white, the abdomen lightly washed with hair brown (dark drab).

RANGE.—Occurs in the greater part of the Atlantic Ocean; rarely noted on the coasts except when driven there by storms;[2] known to breed only on Inaccessible Island, in the South Atlantic.

DISTRIBUTION IN FLORIDA.—J. A. Allen (1871, p. 365), on the authority of Boardman, recorded "a few about the coast at Fernandina." Cory mentions having seen a stuffed specimen supposed to have been taken off the coast near Jacksonville (Howe, 1903c, p. 44). The occurrence of the Greater Shearwater in Florida was definitely established by the capture of one by Theodore Knight, 10 miles north of West Palm Beach, in December, 1913. This specimen is now in the mounted collection of the Florida State Museum (No. 14,230).

[1] His record of four birds killed "off the western shores of Florida" on June 26, 1826, is shown to be incorrect by reference to his Journals (Maria Audubon, vol. 2, p. 365), in which he states that on that date he was in sight of Cuba.

[2] Wayne (1910, p. 8) reports finding large numbers dead on the beach on Long Island, South Carolina, after a severe hurricane on August 27 and 28, 1893.

HAUNTS AND HABITS.—The flight of this species is described as very graceful. Doctor Townsend (Bent, 1922, p. 68) says of the birds:

> With long sharply pointed, slightly decurved wings they scale along close to the waves, sailing into the teeth of the wind by skillfully taking advantage of the air currents deflected upward from the surges. . . . One can not help noticing the shape of their bodies, cylindrical and tapering posteriorly, a cigar shape well adapted for rapid passage through the air without "dragging."

BLACK-CAPPED PETREL: *Pterodroma hasitata* (Kuhl)

OTHER NAME: Diablotin

RECOGNITION MARKS.—Length, 14 to 16 inches; spread, about 39 inches. Head, wings, and upperparts fuscous or fuscous-black, with a whitish collar on the neck; bill black, stout, compressed laterally, strongly hooked; nostrils tubular; forehead, upper tail coverts, lining of wings, and underparts white; legs and upper half of toes and webs flesh color.

RANGE.—Formerly bred in the Lesser Antilles (Guadeloupe and Dominica); now very rare and perhaps nearing extinction. Bent (1922, p. 112) cites 10 records of casual occurrence in eastern North America.

DISTRIBUTION IN FLORIDA.—There is but one record of occurrence in Florida—that of a bird found by Dr. C. H. Stillwell, in the winter of 1846–47, floating in a wounded condition in the salt lagoon opposite Indian River Inlet (G. N. Lawrence, 1847, p. 476). This specimen is now in the collection of the American Museum of Natural History, New York City.

HAUNTS AND HABITS.—These large Petrels formerly nested in burrows on the slopes of mountains in the West Indies. They were strictly nocturnal, remaining in their burrows during the daytime and roaming the seas at night for their food. The birds arrived at their breeding grounds in October or November and remained until the following May, when they all disappeared. They were much sought by the natives for food. Their destruction is attributed in part to volcanic disturbances and in part to the introduction of the mongoose.

STORM PETRELS: FAMILY HYDROBATIDAE

WILSON'S PETREL: *Oceanites oceanicus* (Kuhl)

OTHER NAMES: Long-legged Storm Petrel; Mother Carey's Chicken

RECOGNITION MARKS.—About the size of a Purple Martin (length, 7 to 7.5 inches; spread, about 16 inches). Bill strongly hooked; nostrils tubular. Head and upperparts fuscous-black, underparts fuscous; large white patch on upper tail coverts. Distinguished from other small petrels by its *long legs, yellow, webbed feet, and nearly square tail.*

RANGE.—Breeds on islands in the Antarctic seas and the Indian Ocean; ranges widely over most of the oceans, north in the Atlantic to Labrador and the British Isles.

DISTRIBUTION IN FLORIDA.—Wilson (1813, vol. 7, p. 92)[1] stated that the species bred on the coast of Florida, which has been found not to be the case, but his record of great numbers seen off the coast in July is doubtless correct. J. A. Allen, on the author-

[1] Wilson treated the species under the name of *Procellaria pelagica*, considering it to be the Storm Petrel. In the second edition (1824, p. 94), it appears as *Procellaria wilsonii*).

ity of Boardman, reported "a few about the coast at Fernandina" (1871, p. 365). H. H. Bailey (1925a, p. 13) says that he has seen these birds "in our East Coast waters, both outside and within Biscayne Bay." R. J. Longstreet reports seeing four of these Petrels at Mosquito Inlet, July 3, 1909, and three on August 12, 1911. The only record from the Gulf coast is furnished by F. M. Weston, who observed three birds, July 5, 1926, off the coast near Pensacola.

HAUNTS AND HABITS.—Wilson's Petrel is one of the few birds that breed in the Antarctic and spend the nonbreeding season in the North. The birds appear in the North Atlantic in March, April, and May and are found locally in considerable abundance throughout the summer until October. Their flight is described as graceful and swallow-like, as they skim lightly over the waves, often gathering into flocks about a vessel when scraps of fish "gurry" are thrown overboard. Says Doctor Townsend:

> It is not often that these birds actually settle on the water, but they do so at times and ride as lightly as phalaropes. As a rule the petrels pick up the food as they skim over the water either bounding with both feet together or pattering lightly over the water running or walking with alternate feet. In both cases they keep their wings spread, and support themselves largely on these. . . . The wings are often held motionless and the birds appear to take advantage of the up currents of air deflected from the waves. . . . When picked up wounded or caught in their burrows the birds eject from their bill and nostrils a yellow or reddish oily fluid with a strong musty odor. (Bent, 1922, p. 169.)

WHITE-BELLIED PETREL: *Fregétta trópica trópica* (Gould)

RECOGNITION MARKS.—About the size of Leach's Petrel (length, about 8 inches; wing, 6 to 6.5 inches); tail even, the feathers broad and square-ended. Head, throat, and breast deep mouse gray; wings and tail fuscous-black; belly and upper tail coverts white.

RANGE.—South Atlantic and Indian Oceans, north in the Atlantic to the Gulf of Mexico (accidental).

DISTRIBUTION IN FLORIDA.—This Petrel is included in the North American list solely on a record of its accidental occurrence at St. Marks. Lawrence (1851, p. 117) recorded its capture as follows:

> Seven specimens . . . were captured with a hook and line, by the captain of a vessel, while at anchor in the harbor of St. Marks, Florida. One was obtained from him by Mr. John Hooper, of Brooklyn, L. I., from whom I received it. They were observed about the vessel during two days, after which none were met with.

HAUNTS AND HABITS.—John T. Nichols (quoted by Bent, 1922, p. 175) says of this species:

> In habits it resembles the Wilson petrel. It follows a ship for scraps, about which a little flock gathers, pattering on the water with their feet, their wings extended fluttering over their backs, so that they make a twinkling white spot in the distance. Its note, which I have heard at such times, is a funny little squeak.

TROPIC BIRDS: FAMILY PHAËTHONTIDAE

YELLOW-BILLED TROPIC BIRD: *Phäëthon leptúrus cátesbyi* Brandt

OTHER NAMES: Boatswain Bird; Longtail

RECOGNITION MARKS.—About the size of a Royal Tern (length, 30 to 32 inches, including the long central tail feathers, which may be 18 to 20 inches). Bill yellow, shaped like that of a tern; plumage mainly white, tinged with salmon-pink; wings marked with black, and black stripe through eye. Easily recognized by the greatly elongated central tail feathers.

RANGE.—Breeds in Bermuda, the Bahamas, and certain of the Greater and Lesser Antilles. Winters from the Bahamas south to Brazil. Accidental in Florida, New York, and Nova Scotia.

DISTRIBUTION IN FLORIDA.—In the summer of 1832 Audubon (1835, vol. 3, p. 442) found a flock of 8 or 10 birds at the Dry Tortugas.[1] Maynard (1881, p. 473) reports seeing a single bird in November in the Gulf, "not far from the Florida Keys." Brewster (1886b, p. 481) records a specimen taken April 21, 1886, on the Banana River, Merritt Island, "just after a series of southeast gales." Pennock (1919d, p. 587) mentions a bird of this description seen by a fisherman at St. Marks, May 25, 1919.

HAUNTS AND HABITS.—This handsome and striking species is abundant in the waters of Bermuda and the West Indies, breeding in caves and recesses of the limestone cliffs. The birds wander far over the ocean in search of food, which consists mainly of marine animals obtained by diving from a height of 50 feet or more. In describing their habits Plath says (1913, p. 345):

> A slim, snowy white bird, with long streaming tail, gracefully winnowing its way through the air with rapid wing-beats. . . . They spend much time in the air, and may be seen flying in graceful curves, sometimes swooping in a spiral, with half-closed wings, to the surface of the water, and often alighting there after a skim over the waves. In the water they sit very high, with their tails held well above it. They frequently utter their peculiar cry, which varies—sometimes a rasping *t-chik-tik-tik* or *clik-et-click-et*—again, the noise produced by several birds in the air reminds me of the noise of a greaseless axle on a wagon-wheel.
>
> Their manner of flight differs from most sea-birds; the wings move much more rapidly, and at a distance one might easily mistake them for Pigeons, as their long tails are not then conspicuous. Against the blue of the sky their plumage is dazzling; but see them against the dark background of a cliff, and they appear of a beautiful pale green, due to their glossy plumage reflecting the bright emerald of the water below.

PELICANS: FAMILY PELECANIDAE

WHITE PELICAN: *Pelecânus erythrorhýnchos* Gmelin

RECOGNITION MARKS.—Larger than the Brown Pelican (length, about 5 feet; spread, 8.5 to 9 feet). Plumage white; primaries fuscous-black; bill and feet yellow.

RANGE.—The White Pelican is a bird of the lake regions of the western interior, breeding from Great Slave Lake southward to southern California, Nevada, Utah, and Manitoba, with an outlying colony on the coast of Texas.

DISTRIBUTION IN FLORIDA.—The White Pelican is a regular winter visitant in Florida and has been reported to breed there; but the records are not well substantiated, and it certainly does not breed in the State at present. Captain Dummitt, an old-time resident on the east coast, reported that this species bred one season on a small island in Mosquito Inlet (Maynard, 1881, p. 466). Warden Kroegel, who had charge of the Pelican Island Reservation for many years, states that he came to that region in 1881, at which time about 200 White Pelicans were using for a roosting place a sand-bar in the Banana River, east of Cocoa. He was told by others that the birds had nested in that vicinity, but he saw no evidences of it himself, either then or later.

[1] Although this record appears under the name *Phaëthon aethereus*, it seems probable that the birds referred to were of the present species.

PLATE 9

EXPLANATION OF PLATE 9

BIRDS OF THE LAGOONS

These lagoons lie between the outer beaches and the mainland and furnish shelter and feeding shallows for many water birds. Those shown are: Upper center, an Osprey with a fish, chased by a Bald Eagle; perched at the left, an immature and an adult Florida Cormorant; at the right, flying, a male and a female Red-breasted Merganser, and in the right distance a Common Loon in winter plumage. The three birds at the lower left are immature male, adult male, and female Lesser Scaup Ducks; the pair in the center are female and male Ring-neck Ducks; the two birds at the lower right are male and female Ruddy Ducks.

PLATE 9

Nonbreeding birds sometimes remain during the summer. Kline (1887a, p. 412) recorded the capture of 5 birds at Shell Point, June 20, 1886, and C. J. Pennock observed hundreds at that place, March 18 to 20, 1919. Mr. Pennock also reported flocks of 6 and 20 birds in the bay near St. Marks on August 29, 1913. H. P. Bennett counted 38 birds on the Cow and Calf Keys, Tampa Bay, on August 3, 1924; these had been in the vicinity since early in July. A flock of 26 was seen at the same place in March, 1923.

B. J. Pacetti observed a flock of 6 White Pelicans at Ponce Park, September 7 to 10, 1912; another flock of 6 at the same place, November 2 and 9; and a flock of 14, November 20 to 25. R. J. Longstreet reports a flock of 60 around Brevard Island, Mosquito Lagoon, January 23, 1927. Savage and Eaton saw 27 birds on oyster flats in a lagoon near Matanzas, February 25, 1930. A flock of about 100 was noted by Miss Earle at Passage Key on November 3, 1910, and one of about 50 spent the winter and early spring months (1906–7) in Gasparilla Sound (Bowdish, 1909, p. 117). On April 2, 1926, we saw 9 White Pelicans on Ingraham Lake, near Cape Sable, and on February 26, 1927, Bayard Christy observed the same number on the same lake. A flock of 20 was noted in Perdido Bay, near the eastern shore, April 11, 1926, and a bunch of 6 on a sand bar in the surf near the eastern end of Santa Rosa Island, April 22, 1926. Weston records 4 birds near Pensacola, October 13, 1928, and Stoddard one at Lake Jackson, October 4, 1925. Maynard (1881, p. 466) found the birds abundant near Cedar Keys, and Wayne (1893, p. 337) reported them abundant in winter near the mouth of the Suwannee River, the birds remaining until the middle of May.

HAUNTS AND HABITS.—The White Pelican differs widely from the common Brown Pelican of Florida, not only in appearance, but in habits. During their winter sojourn in the South, these immense white birds resort to the shallow bays and lagoons along the coasts, resting quietly on the water or standing on a sand bar, and in such situations they are always conspicuous. They never dive for their food but obtain it from near the surface by swimming or wading. Their method of feeding has been well described by Goss (1888, p. 25) as follows:

> I have often noticed the birds in flocks, in pairs, or alone, swimming on the water with partially opened wings, and head drawn down and back, the bill just clearing the water, ready to strike and gobble up the prey within their reach; when so fishing, if they ran into a shoal of minnows, they would stretch out their necks, drop their heads upon the water, and with open mouths and extended pouches scoop up the tiny fry. Their favorite time for fishing on the seashore is during the incoming tide, as with it come the small fishes to feed upon the insects caught in the rise, and upon the low forms of life in the drift, as it washes shoreward, the larger fishes following in their wake, each from the smallest to the largest eagerly engaged in taking life in order to sustain life. All sea birds know this and the time of its coming well, and the White Pelicans that have been patiently waiting in line along the beach, quietly move into the water, and glide smoothly out, so as not to frighten the life beneath, and, at a suitable distance from the shore, form into line in accordance with the sinuosities of the beach, each facing shoreward and awaiting their leader's signal to start. When this is given, all is commotion; the birds, rapidly striking the water with their wings, throwing it high above them, and plunging their heads in and out, fairly make the water foam, as they move in an almost unbroken line, filling their pouches as they go. When satisfied with their catch, they wade and waddle into line again upon the beach, where they remain to rest, standing or sitting, as suits them best, until they have leisurely swallowed the fishes in their nets; then, if undisturbed, they generally rise in a flock, and circle for a long time high in air.

FOOD.—The White Pelican has been found to feed largely upon carp, suckers, and similar fishes of small value for human consumption.

EASTERN BROWN PELICAN: *Pelecânus occidentâlis occidentâlis* Linnaeus

OTHER NAME: **Blue Pelican**

RECOGNITION MARKS.—Recognized by its great size (length, 44 to 56 inches; spread, 6.5 to 7 feet), large pouch, and slow, steady flapping, alternated with periods of sailing. *Adult* in summer: Upperparts silvery gray; underparts grayish brown; head yellowish white; neck fuscous, bordered with white. In winter, similar, but with neck entirely white. *Young* in nesting plumage, entirely white. *Immature:* Head and neck drab-gray; belly white. (Plate 12.)

RANGE.—Breeds on the south Atlantic and Gulf coasts of the United States, from South Carolina to southern Texas, and on the coasts of Central and South America, south to Brazil; occurs also in the Bahamas and West Indies; accidental north to Nova Scotia and west to Wyoming.

DISTRIBUTION IN FLORIDA.—The Brown Pelican is an abundant and characteristic bird at all seasons on all the coasts. On the Gulf coast, large colonies breed on Indian Key in Tampa Bay; on several small keys in Charlotte Harbor, Pine Island Sound, and Matlacha Pass; on a key in Suwannee Sound, near Cedar Key; at Chokoloskee Pass; and on Palm Key, off Cape Sable. The birds formerly bred on St. George Island (1860); at New Smyrna (1859); Indian Key (1858); Marquesas Keys (1889); Newfound Harbor; and the Tortugas (1860). They are occasionally seen in small numbers at the present time on the Florida Keys as far as Key West and the Tortugas. Bartsch observed a flock of 100 or more on Boca Grande Key, January 6, 1919.

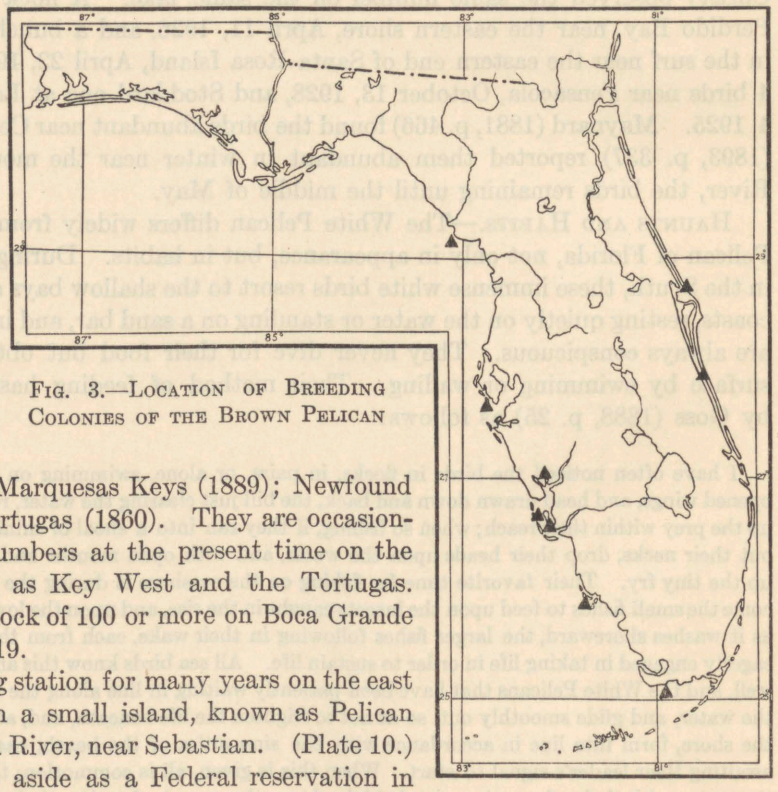

FIG. 3.—LOCATION OF BREEDING COLONIES OF THE BROWN PELICAN

The only breeding station for many years on the east coast was located on a small island, known as Pelican Island, in the Indian River, near Sebastian. (Plate 10.) This island was set aside as a Federal reservation in March, 1903, and in November of that year a large warning sign was erected by the National Association of Audubon Societies. This sign proved objectionable to the birds and during the season of 1903–4 they all deserted the island and part of the colony nested on two near-by islands. After the removal of the offending board, the birds

returned the following season and continued to nest there until the fall of 1923, when they permanently deserted their ancestral nesting ground and moved about 60 miles north to Brevard Island in the southern part of Mosquito Lagoon (Chapman, 1924, p. 207).[1] The presence of the birds here aroused the enmity of local fishermen, and in February, 1924, the colony was raided and more than a thousand birds were killed (Pearson, 1924b, p. 221). Another setback occurred on December 1, 1925, when practically all the young were killed by a severe storm. Since that date, however, the colony has prospered, and on November 28, 1928, we found the birds in fine condition and showing a decided increase over the previous season. The new location has been set aside for a bird reservation under the name of the Brevard Reservation.

HAUNTS AND HABITS.—Small companies of Brown Pelicans may be seen at almost any time along the sea coasts, winging their way in single file over the surf, sometimes almost touching the waves with their wings, again rising to a height of 20 feet or more. They fly steadily, flapping their great wings slowly in unison and varying the flapping with short periods of sailing. When fishing, they usually ascend to a height of 15 to 30 feet and when a fish is spied set their wings at an angle and plunge beneath the water with a great splash, emerging again at once with a fish in their bill. The plunge is made *down wind* and the bird emerges *up wind* (Nichols, 1918, p. 21). The Pelicans are often robbed of their catch by Man-o'-war-birds or by Laughing Gulls, the latter species sometimes alighting on the head of a Pelican and snatching a fish from its pouch (Gudger, 1929, p. 435). When their hunger is satisfied, the Pelicans resort to the mud flats and sand bars along the coast, where they roost in flocks often of considerable size. About the harbors they spend much time sitting sedately on pilings, often in company with Royal Terns or Laughing Gulls—always, of course, but one bird on a post.

During the nesting season the Pelicans are very clannish, breeding always in colonies of considerable size on small islands in the coastal lagoons. The nests are bulky structures built of green twigs and placed in the branches of low trees, usually mangroves, at a height of 8 to 20 feet above the ground. In the Tampa Bay colony, Fargo found the birds building on March 10, 1927—the first young being seen about the first of May. In 1923, Warden Perry Wetmore counted 412 nests in the colony, and estimated 500 as the total number. B. J. Pacetti estimated that 700 birds were nesting in Pine Island Sound, May 25, 1922, the young being mostly well feathered. The colony on Palm Key, near Cape Sable, is estimated to contain 500 pairs, nesting chiefly in the saffron plum trees (*Bumelia angustifolia*) which fringe a portion of the island. Here, on April 6, 1926, we found young of various sizes, mainly half or two-thirds grown, in all the nests, usually two birds to each nest. Most of the larger young ones were standing up in the nests, uttering a weak croak, and when we approached too near, they attempted to climb out of the nests. This colony was reported by resident fishermen to nest during a large part of the year.

The historic colony on Pelican Island in the Indian River originally nested in the same manner as the west coast birds. Dr. Henry Bryant, writing of this colony in 1859,

[1] R. S. Sheldon, an old-time resident of the region, states that "as far back as any one can remember, the Brown Pelicans nested in great quantities on a small island in the south end of Mosquito Lagoon [probably Brevard Island], and continued to do so until about ten years after the Civil War."

stated that the nests were placed in the tops of the mangrove trees, which were about the size and shape of large apple trees. After many years of such use, all the trees on this island died and were broken down. This did not discourage the Pelicans, however, for they continued to build nests on the ground. (R. H. Lawrence, 1891, p. 231.) In 1898, according to Chapman (1908c, p. 84), a few trees were still left standing, but not enough to supply all the birds. In the fall of 1906, the colony was estimated to contain 1,200 nests, and the total number of birds at the end of the nesting season was estimated at 4,000 to 5,000. In the season of 1910–11 the number of nests was estimated at 5,000 (Plate 10).

The nesting season began there in winter, and continued more or less without interruption until midsummer. In 1903, the warden reported that the first eggs were laid on December 1; from that time on the birds began to lay a little earlier each year, and in 1909 the first eggs were found on October 16. During the years 1908 to 1910 the island was occupied continuously as a nesting site, from the last week in October, 1908, when the main body of Pelicans arrived and began building, until the third week in October, 1910, when a severe hurricane flooded the island and compelled the birds to seek a new site. This they found on a larger island about 400 yards away, and although a portion of it was well wooded with large black mangroves, the great majority of the birds preferred to nest on the ground, as they had been doing on their old island (Nelson, 1911, pp. 393–397). The following season they occupied the original nesting site again.

Visiting the island in February, 1914, Chapman (1914a, p. 124) found large numbers of dead young lying on the ground and the few remaining live ones dying of starvation, having for some unknown reason been deserted by their parents. In 1922, Warden Kroegel reported the arrival of the Pelicans on August 14; nesting began at once and the first eggs were laid on August 25; the first young hatched on September 26.

After the removal of this colony to their new location on Brevard Island in the fall of 1923, the birds continued their habit of nesting in autumn. On January 23, 1927, Longstreet noted that nearly all the young had left the nests and some were able to fly. On November 28, 1928, I found the colony in a flourishing condition, and estimated it to number more than 2,000 pairs. The nests contained eggs and young in all stages, many of the young having left the nests and taken to the shallow water near the shore, although not yet able to fly. When D. J. Nicholson visited the island on September 29, 1929, about 80 per cent of the nests contained young, some of which were estimated to be 5 or 6 weeks old. On August 10, 1930, Joseph Howell, Jr., found the colony in a flourishing condition and so populous that the birds had taken possession of a near-by island. At this date some nests contained fresh eggs, others young about six weeks old. On October 5, 1930, the colony was visited by R. J. Longstreet, Oscar Baynard, D. J. Nicholson, J. C. Howell, Jr., and Dr. H. R. Mills. The nests on the main island were estimated by Nicholson to number 2,250, with an average of 2.5 young birds to each nest. Doctor Mills (1931, p. 32) estimated a total of 3,000 pairs on the two islands. Warden Kelsey visited the island on June 26, 1931, at which time nearly every nest contained its full complement of eggs.

The majority of the nests in this rookery are in black mangrove trees at heights varying from 4 to 10 feet above the ground; some are in clumps of yucca, and a considerable

FIG. 1.—BROWN PELICANS NESTING IN TREES ON PELICAN ISLAND, FEBRUARY, 1919
(Photo by Alexander Wetmore)

FIG. 2.—BROWN PELICANS NESTING ON THE GROUND ON PELICAN ISLAND, FEBRUARY, 1919
(Photo by Alexander Wetmore)

FIG. 1.—FLORIDA CORMORANTS NESTING IN A PINE AT OZONA, HILLSBOROUGH COUNTY
(*Photo by W. G. Fargo*)

FIG. 2.—WARD'S HERON ON NEST, TAMPA BAY. (*Photo by W. G. Fargo*)

number are flat on the ground. The young birds that are old enough to stand up in the nests show fear at the approach of a person and emit continually a squawking note; when one gets close, they make forward passes at him with their bills; some of the older young attempt to climb into the trees in their efforts to escape, and some fall to the ground, where they walk about in flocks or swim in the shallow water near shore. Upon being disturbed, the young throw up the fish that composed their last meal.

FOOD.—The Florida Pelicans have frequently been charged with the destruction of food fishes, but careful investigations conducted by the Biological Survey and the National Association of Audubon Societies have shown these charges to be largely unfounded. At Pelican Island, in February, 1919, when about 2,000 pairs of the birds were present, an agent of the Bureau found that menhaden composed more than 90 per cent of the Pelican's food, while other fishes of little or no commercial value formed 7 per cent, and edible species only 1.3 per cent, of the total. Of 1,276 fishes picked up in the Pelican colony at Indian Key, Tampa Bay, only 39 were valuable commercially, the rest being thread herring and menhaden. On Palm Key, near Cape Sable, I examined a number of fish dropped by the young pelicans, and practically all were mullet, ranging up to about a pound in weight. All the fish dropped by the birds in the Brevard Island rookery in November, 1928, were menhaden, ranging from 6 to 10 inches in length.

T. Gilbert Pearson (1919a, pp. 509–511), after an extended investigation of the food habits of this species, reported the finding in the southern Florida rookeries of the following species of fish: Mullet, pigfish, Gulf menhaden, pinfish, thread herring, top minnow, and crevalle. He says:

> Of the 3,428 specimens [of fish] taken in Florida waters only twenty-seven individual fish were of a kind ever sold in the markets for food, and not a single specimen of the highly prized varieties, such as trout, mackerel, or pompano, could be discovered in the possession of any pelican.

BOOBIES AND GANNETS: FAMILY SULIDAE

ATLANTIC BLUE-FACED BOOBY: *Súla dactylátra dactylátra* Lesson

RECOGNITION MARKS.—About the size of the common Booby. Plumage white, the primaries and tail feathers fuscous; bill grayish yellow; bare skin of face blue; feet light red.

RANGE.—Breeds on islands off the coast of Venezuela, Colombia, and Yucatan, and on some of the Lesser Antilles (formerly the Bahamas); accidental or casual in Florida, Louisiana, and Texas.

DISTRIBUTION IN FLORIDA.—The Blue-faced Booby is an occasional visitor to the Tortugas, and Bartsch says that it is yearly becoming more common there. He took an immature specimen on May 16, 1919, and in June, 1924, photographed a number of adults at close range. Between August 13 and 24, 1925, he observed about 24 birds. His published records of the Red-footed Booby (1919, p. 492; 1920, p. 205) refer instead to this species. H. H. Bailey (1925a, p. 14) reports that he examined a Booby captured alive in the Gulf Stream off Palm Beach County in 1922, which he records as *Sula nebouxii*—a Pacific species; probably it should be referred to the present species.

HAUNTS AND HABITS.—The Blue-faced Booby breeds on sandy islands in the tropical oceans. Snodgrass and Heller (1902, p. 513) state: "The species was observed fishing

at sea, 300 miles from the island [Galapagos], and it is probable that the birds, in pursuit of food, daily travel more than 100 miles from their breeding grounds."

WHITE-BELLIED BOOBY: *Súla leucogâster leucogâster* (Boddaert)

OTHER NAMES: **Brown Booby; Brown Gannet**

RECOGNITION MARKS.—About the size of a Cormorant (length, 30 inches; spread, 48 inches; bill, 4 to 5 inches). Body, wings, and tail fuscous (except the belly, which is white); bill and feet yellow. Young with dusky bill and brownish or grayish belly.

RANGE.—Breeds in the Bahama Islands; some of the West Indies; off the coasts of Honduras, Costa Rica, Venezuela, and Brazil; and in the tropical Atlantic Ocean. Winters from the Bahamas and Florida south to the Straits of Magellan. Accidental off Cape Cod, Massachusetts, and on coast of Louisiana.

DISTRIBUTION IN FLORIDA.—Audubon reported the species breeding abundantly on the Tortugas in 1832; but it has apparently abandoned those islands as a breeding ground, and recent observers have not found it nesting there. Bryant (Howe, 1904a, p. 54) found the birds on the Tortugas in numbers in 1861, but not breeding. Bartsch (1919, p. 492), in 1917 and succeeding years, recorded them present in small numbers, perching on the channel stakes off shore. J. A. Allen (1871, p. 365) reported the species from near St. Augustine on the authority of Boardman, and from Cape Canaveral on the authority of Maynard. Bangs (1902b, p. 395) recorded numbers seen off the beach opposite Micco, February 16, 1895, during a severe storm. R. J. Longstreet picked up a dead specimen on the beach at Coronado, December 11, 1910. S. R. Ingersoll reported the species seen occasionally from the beach off Volusia County, citing dates of February 8 and 24, and April 3, 1918. A specimen was taken at Key West, October 23, 1929.

HAUNTS AND HABITS.—Audubon found these Boobies roosting on a small sand bar called Booby Island in the Tortugas, and nesting on a near-by island occupied also by Noddy Terns. Their nests were placed on tops of bushes at a height of 4 to 10 feet; at the time of Audubon's visit (May 14, 1832) most of the birds were sitting, either on a single egg or a young bird. In the Bahamas, however, where this species is an abundant breeder, its nests are usually slight hollows in the ground, sometimes with a scanty lining of dried grass, and the usual number of eggs is two.

Audubon (1835, vol. 3, p. 65), describing the flight and feeding habits of the Booby, says:

> The flight of the Booby is graceful and extremely protracted. They pass swiftly at a height of from twenty yards to a foot or two from the surface, often following the troughs of the waves to a considerable distance, their wings extended at right angles to the body; then, without any apparent effort, raising themselves and allowing the rolling waters to break beneath them, when they tack about, and sweep along in a contrary direction in search of food, much in the manner of the true Petrels. Now, if you follow an individual, you see that it suddenly stops short, plunges headlong into the water, pierces with its powerful beak and secures a fish, emerges again with inconceivable ease, after a short interval rises on wing, performs a few wide circlings, and makes off toward some shore. At this time its flight is different, being performed by flappings for twenty or thirty paces, with alternate sailings of more than double that space. When overloaded with food, they alight on the water, where, if undisturbed, they appear to remain for hours at a time, probably until digestion has afforded them relief.

PLATE 12

EXPLANATION OF PLATE 12

BROWN PELICANS AT THEIR ROOKERY

This shows a rookery on the west coast of Florida, in which the nests of the Pelicans are placed in the tops of mangrove trees. The birds with brown on the necks are adults in breeding plumage; one in the middle foreground with white neck is an adult in post-breeding plumage; the diving bird is an immature individual. Flying at the upper left are three Man-o'-war-birds, the one with white breast being a female.

PLATE 12

Concerning its voice, Bent remarks (1922, p. 207): "The booby is usually a silent bird, but when excited it is said to utter loud and raucous cries which have been likened by various observers to the croak of a raven, the honk of a goose, or the hoarse quack of a duck." Audubon says its note is somewhat like that of a strangled pig, resembling the syllables *hork, hork.*

Food.—Audubon states that the Boobies observed by him on the Tortugas brought flying fish and small mullets to their young. In the throats of several birds that he shot were mullets measuring 7 or 8 inches in length. Bryant (1859b, p. 125) found in the stomachs of specimens taken in the Bahamas many kinds of fish, "among them a cottus, a parrot-fish, flatfish of two species, and some large prawns; but their principal food seemed to be flying fish, and a species of *hemirhamphus.*"

GANNET: *Móris bassána* (Linnaeus)

Other Names: White Gannet; Solan-Goose

Recognition Marks.—About the size of a Canada Goose (length, 37 to 39 inches; spread, 68 to 74 inches). *Adult:* White, with black primaries and the head washed with buff. *Young:* Chiefly fuscous, mottled with white, the belly paler. Gannets are easily recognized by their habit of plunging for their prey.

Range.—Abundant in the north Atlantic, breeding in the British Isles, Iceland, Labrador, and in the Gulf of St. Lawrence, and ranging south in winter to Cuba, the Gulf of Mexico, and the coasts of northern Africa.

Distribution in Florida.—The Gannet occurs regularly along the east coast of Florida and less frequently on the west coast. Worthington reported it common on Amelia Island in February, 1906, and S. R. Ingersoll saw large numbers near Mosquito Inlet on February 24, 1918, feeding upon small fish just outside the breakers. Longstreet records it common at Daytona Beach, the birds arriving in December and departing by the middle of April. Helmuth (1920, p. 257) says the birds were abundant in flocks of considerable size, 15 miles off St. Augustine, February 26, 1918. James Savage and E. H. Eaton, in February, 1930, counted 43 off the shore of Merritt Island, and 15 off shore at Melbourne Beach. A mounted specimen (No. 14,191) in the Florida State Museum was killed in 1902 by Theodore Knight, 10 miles north of West Palm Beach. Ike Shaw reports one found in a dying condition during a gale in the autumn of 1918 on the coast near Fort Myers, this being the only time he had ever seen the bird there. F. M. Weston observed two adults and one immature bird along the Gulf beach near Pensacola, April 3, 1931. A Gannet was killed by an airplane at Jacksonville Beach, May 12, 1924.

Haunts and Habits.—The Gannet is a bird of the sea, occasionally seen near the coasts, but feeding chiefly at some distance off shore and nesting in large colonies on rocky islands. Its behavior on the wing is thus described by Bent (1922, p. 227):

> The flight of the Gannet is a magnificent performance as it soars aloft on its long, pointed, black-tipped wings, its spearlike head and beak, and its slender tapering tail offering little resistance to the air, as it sweeps in great circles far above the sea until almost lost to sight in the blue sky. When traveling it flies close to the water, flapping its wings and sailing at intervals with wings fully outstretched, after the manner of the pelicans. It is well built for speed and its flight is powerful and long sustained. Its peculiar shape, forming an almost perfect cross while soaring, serves to identify it, as far as it can be seen.

Doctor Townsend (Bent, 1922, p. 225) describes its method of fishing as follows:

The Gannet flies rapidly over the water and begins to soar at a height of from 30 to 100 feet, often rising just before the plunge. At the plunge the head is pointed down, the tail up; the wings are partly spread so that the bird appears like a great winged arrow. The speed of the descent is great, and the wings are closed just before reaching the water, which spurts up to a height of from 5 to 15 feet. After the waters have subsided following the splash and all is still, the bird suddenly and buoyantly comes to the surface, the head and neck stretched out first. It then sits quietly on the water for half a minute or so to finish swallowing the prey and to rest, and then slowly and laboriously rises to windward, with its long neck and tail stretched to their full extent. Gaining a height of thirty or more feet, it swings around to leeward and is soon soaring and plunging again.

Food.—Bent (1922, p. 226) says of this species:

The Gannet is a voracious feeder and undoubtedly consumes an enormous number of fish; it is not partial in its choice, though it feeds largely on herring and mackerel where they are abundant in schools; it also takes capelin and other species as well as small codlings.

CORMORANTS: Family Phalacrocoracidae

DOUBLE-CRESTED CORMORANT: *Phalacrócorax aurítus aurítus* (Lesson)

Other Names: Nigger-Goose; Water-Turkey; Shag

Recognition Marks.—Length, about 30 inches; spread, about 50 inches; bill narrow, strongly hooked. *Adult:* Plumage glossy greenish black, the back and wings mottled with brownish; lores and throat-pouch orange; eyelids and mouth blue; iris green. *Immature:* Plumage grayish brown, the belly more or less whitish (Plate 9). Cormorants when flying resemble large ducks, but are longer bodied; they often alternate flapping with brief periods of sailing.

Range.—Widely distributed in eastern North America, breeding from Great Slave Lake and the Gulf of St. Lawrence southward to the coast of Maine, central Illinois, northeastern Arkansas, and northern Utah. Winters chiefly on the Atlantic and Gulf coasts, from New Jersey to Florida and Louisiana.

Distribution in Florida.—This northern race apparently occurs not uncommonly in Florida in winter, south at least to Okeechobee Lake. Five individuals, all of which had been banded at various points in Quebec, were captured in Florida as follows: Kissimmee River, 10 miles from Okeechobee, December 12, 1925; Daytona, December 19, 1926; Lake Apopka, January 1, 1930; Vero Beach, January 15, 1930; Clewiston, February 19, 1930 (Lewis, 1931, p. 48). One was shot at St. Marks, January 12, 1920. Cormorants are moderately common in winter in Choctawhatchee Bay and all along the Gulf coast; probably some of them are of this northern race, since several specimens from the coast of Alabama were referred to this race (Howell, 1924, p. 39).

Haunts and Habits.—See under the Florida Cormorant.

FLORIDA CORMORANT: *Phalacrócorax aurítus floridánus* (Audubon)

Other Names: Water-Turkey; Nigger-Goose

Recognition Marks.—Exactly like the northern race except for smaller size; wing of male, 11.25 to 12.30 inches; of female, 10.75 to 11.34 inches; bill of male, 2.16 to 2.44 inches; of female, 2.05 to 2.22 inches. (Plate 9.)

Range.—Throughout Florida and northward on the Atlantic coast to North Carolina; also in Louisiana, on some of the Bahama Islands, and on the Isle of Pines.

PLATE 13

EXPLANATION OF PLATE 13

HERONS IN THE EVERGLADES

Vast numbers of herons of several species feed in the Everglades, and at certain seasons they may be seen to advantage from the motor highways. The birds shown are: Upper left, an adult and two immature (white) Little Blue Herons. Upper center, an American Egret; upper right, a single Snowy Heron. Lower right, three Louisiana Herons, two adult and one (the center bird) immature. The standing bird is a Ward's Heron.

PLATE 13

DISTRIBUTION IN FLORIDA.—The Florida Cormorant is very abundant on the Gulf coast, and less numerous on the east coast and on many of the lakes in the interior. Large nesting colonies are known on the Wacissa River; on Indian Key in Tampa Bay; Big Bird Key, near Chokoloskee; in Cuthbert Lake, near Cape Sable; and on Manofwar Key. Smaller colonies occur at the mouth of Chassahowitzka River, in Pine Island Sound, Lake Istokpoga, Lake Mattie, Lake Okeechobee, and on several of the Florida Keys. Breeding specimens have been taken in Tampa Bay and on the Aucilla River.

In February, 1924, W. G. Fargo reported that a flock of 2,000 to 3,000 Cormorants roosted nightly on the reefs south of Pass-a-Grille, and on December 4, 1910, Miss Eleanor Earle saw about 10,000 of the birds at Passage Key. Alexander Wetmore, on January 21, 1919, observed a flock of 5,000 to 6,000 birds at the entrance to Terra Ceia Bay. A great run of anchovies had come in and the Cormorants, spread out in a long semicircular line, were following them. On March 28, 1925, E. J. Court saw great flocks of Cormorants, with ibises and herons, flying from the mainland at Cape Sable to the outlying keys to roost at night. On Porgee Key, January 22, 1919, Bartsch noted a flock of 100 or more.

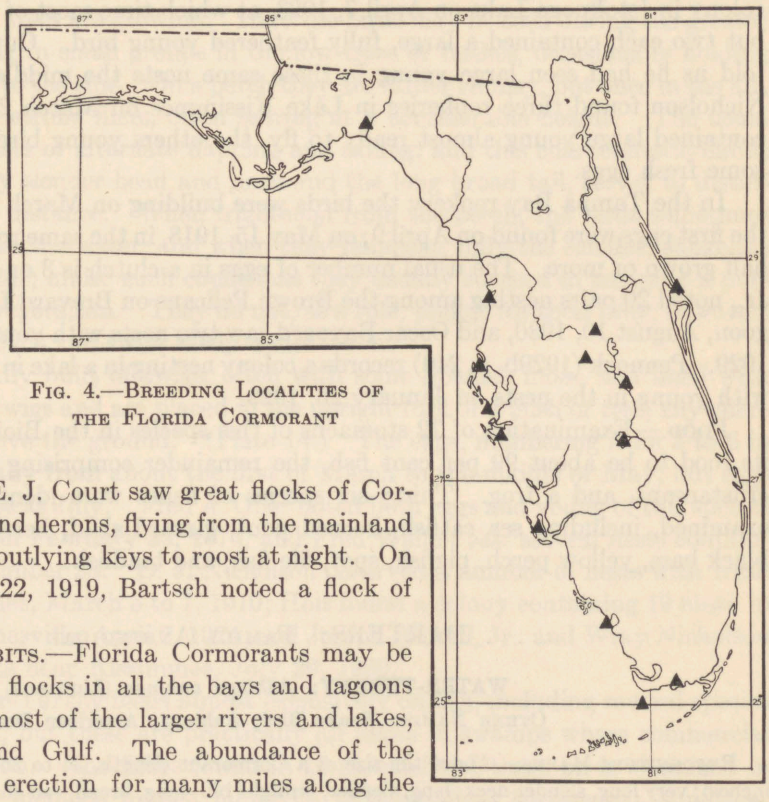

FIG. 4.—BREEDING LOCALITIES OF THE FLORIDA CORMORANT

HAUNTS AND HABITS.—Florida Cormorants may be seen in small or large flocks in all the bays and lagoons along the coasts, in most of the larger rivers and lakes, and in the ocean and Gulf. The abundance of the birds has led to the erection for many miles along the Gulf coast of a series of racks to catch the excrement of the birds, which is collected and used for fertilizer. During the greater part of the year, particularly during the colder months, long lines of Cormorants may be seen flying in single file along the coast, many of them alighting on the racks and others in the sea to fish. Their food is obtained by diving from the surface or swimming under water. They are able to remain under for long periods, and when in pursuit of their prey they sometimes use both feet and wings in swimming and are then capable of great speed. Nichols (1918, p. 20) notes their habit of following a school of porpoises, "swimming and making short flights, diving close after them." They rise into the air rather slowly, but once under way, their flight is swift and steady. The birds are silent for the most part, but when suddenly alarmed,

utter a hoarse, guttural croak like that of a bullfrog. The young, while in the nest, keep up a continual chirping.

Most of the Florida Cormorants select for a nesting site one of the heron rookeries along the Gulf coast, but a considerable number breed in lakes in the interior. The nests are compactly built of twigs and moss, and placed usually near the tops of trees, chiefly cypress or mangrove, 10 to 40 feet above the ground. An unusual nesting site was discovered by W. G. Fargo on the west coast near Ozona, where a small colony had built their nests in a longleaf pine (Plate 11).

Different colonies vary greatly in the date of beginning to nest; we examined a small colony in Istokpoga Lake on April 7, 1923, at which time most of the nests were empty, but two each contained a large, fully feathered young bird. Our guide, W. F. Ewing, told us he had seen large young in these same nests the middle of February. D. J. Nicholson found three rookeries in Lake Kissimmee on March 22, 1910, one of which contained large young almost ready to fly, the others young birds of various ages and some fresh eggs.

In the Tampa Bay rookery the birds were building on March 10, 1927 (Fargo), and the first eggs were found on April 9; on May 15, 1918, in the same rookery, the young were half grown or more. The usual number of eggs in a clutch is 3 or 4. Joseph C. Howell, Jr., noted 20 pairs nesting among the Brown Pelicans on Brevard Island in Mosquito Lagoon, August 10, 1930, and Oscar Baynard saw two nests with young there on October 6, 1929. Pennock (1929b, p. 249) records a colony nesting in a lake in south-central Florida, with young in the nests on January 26, 1929.

Food.—Examination of 72 stomachs of this species in the Biological Survey showed its food to be about 99 per cent fish, the remainder comprising crabs, shrimps, other crustaceans, and a frog. Thirty-six species of fishes were identified in the stomachs examined, including sea catfish, horned pout, gizzard shad, herring, skipjack, sunfish, black bass, yellow perch, pigfish, spot, file fish, and toadfish.

DARTERS: Family Anhingidae

WATER-TURKEY: *Anhinga anhinga* (Linnaeus)

Other Names: **Snake Bird; Anhinga; American Darter**

Recognition Marks.—About the size of a Cormorant (length, 34 to 36 inches; spread, about 44 inches); very long, slender neck; long, slender, straight bill; long, broad, fan-shaped tail, spread in flight; neck carried straight in flight. *Male:* Plumage glossy greenish black, the wing coverts marked with pale gray; tail tipped with pale brown. *Female:* Head, neck, and breast grayish buff; otherwise like male. (Plate 18.)

Range.—Tropical and subtropical parts of North and South America, north to North Carolina southern Illinois, and Arkansas, and south to Argentina.

Distribution in Florida.—Breeds in suitable localities throughout the State, abundantly in the southern and central parts, and less commonly in the northern part. R. W. Williams (1904, p. 451) records it as a common summer resident in Leon County but not found in winter. Weston reports it breeding in moderate numbers in the swamps in northern Escambia County. Chapman (1888a, p. 268) notes the wintering of three

birds at Gainesville in 1886–87. Baynard (1913a, p. 241) gives it as an abundant resident in Alachua County. It is very numerous along the marshy shores of the St. Johns River above and below Lake Washington. It is known to breed, also, on the Wakulla River and at Waukeenah, New Smyrna, Archer, Orange Lake, Seven Oaks (near Safety Harbor), Chassahowitzka River, Lake Ashby, Lake Kissimmee, Lake Istokpoga, Sebastian River, Cape Sable, and many other places. M. S. Crosby observed a single bird at Key Largo, February 11, 1926, and Bartsch found a nest with 2 eggs and 2 young in Barnes Sound, May 4, 1919.

HAUNTS AND HABITS.—The Water-Turkey is a dweller in marshy sloughs or ponds in which bushes or small trees are growing. Here the birds may be seen during the greater part of the day, sitting in small groups in the low trees or bushes, occasionally holding their wings outspread to the sun. On a perch they are rather clumsy, but once in the air, they are graceful and strong fliers, often soaring at a considerable height. The usual manner of flight consists of alternate flapping and sailing, and this characteristic habit, together with the very slender head and neck and the long broad tail, serves to distinguish the bird at any distance. When frightened from the perch, the birds sometimes drop like an arrow into the water, and when they reappear, only the slender, snakelike neck shows above water; under such conditions they usually succeed in escaping a pursuer by hiding in the vegetation. They do not, as a rule, plunge for their prey, however, but dive from the surface and swim easily under water.

The nests are solidly built of twigs, often with some Spanish moss, and lined with green leaves or small twigs and are placed in the upright fork of a bush or tree, anywhere from 5 to 100 feet above the ground. (Plate 14.) The eggs, numbering from 3 to 6 in a clutch, are laid usually from about the first of March to the middle of May, but eggs have been found as late as July. Fred A. Ober noted both eggs and young of this species at Okeechobee Lake on February 23, 1874, and Fred Walker saw several nests containing fresh eggs on December 28. D. J. Nicholson observed a number of nests with fresh eggs on Lake Kissimmee, March 5 to 7, 1910; Holt found a colony containing 19 nests in Jonas Pond, near Gainesville, April 7, 1924; and Joseph Howell, Jr., and Wray Nicholson noted 7 occupied nests near Kissimmee, July 29, 1930.

FOOD.—The Water-Turkey feeds almost exclusively on fish, including several species used for food by man, but these are practically all taken in swamps where commercial fishing is not carried on. The fishes found in 16 stomachs of these birds examined in the Biological Survey included mullet, mojarrita (*Eucinostomus harengulus*), sunfishes, pickerel, bream, and gizzard shad. Insects were noted in a few stomachs, and one was nearly filled with large caddis larvae.

MAN-O'-WAR-BIRDS: FAMILY FREGATIDAE

MAN-O'-WAR-BIRD: *Fregâta magnificens* Mathews

OTHER NAMES: **Frigate Bird; Frigate Pelican; Hurricane Bird**

RECOGNITION MARKS.—Body, about the size of a Cormorant (length, about 40 inches; spread, 7 to 8 feet), but wings very much longer and *tail deeply forked;* bill about 4 inches, strongly hooked. *Adult male:* Plumage entirely black, the back glossed with green and purple; bill purplish blue; gular sac

orange. *Adult female:* Dull black, the breast with a large white patch. *Immature:* Head and underparts white; back and wings brownish black. (Plate 12.)

RANGE.—The Man-o'-war-bird is widely distributed in the tropical seas, breeding in the Bahamas, the West Indies, and southward to the coast of Venezuela.

DISTRIBUTION IN FLORIDA.—Although this species visits the Florida coasts regularly, sometimes in considerable numbers, there is no positive record of its breeding in the State. Audubon (1835, vol. 3, p. 496) gives a detailed account of its breeding habits on one of the Florida Keys in 1833, but there are discrepancies in his account that suggest that he may have been mistaken as to the owners of the nests he saw. Later observers have not found any breeding colonies in that region.

Man-o'-war-birds usually select the vicinity of a rookery of herons or pelicans for their roosting place, and often spend weeks, or even months, in one locality. Perry Wetmore, when warden of Indian Key Bird Refuge in Tampa Bay, stated that thousands of these birds made their headquarters on the key during the summers of 1922 and 1923. We observed about 400 there May 10 to 15, 1918. T. J. Ashe, warden at the Tortugas Keys Bird Refuge, reported about 1,000 Man-o'-war-birds living there in 1911. M. S. Crosby noted 14 at Tavernier, February 17, 1925, and 30 at Newfound Harbor, February 24, 1925. We saw a flock of about 75 on Manofwar Bush, April 6, 1926, a tiny key that received its name on account of its selection by the birds for a roosting place. Bent (1922, p. 312) reports a flock of more than a thousand birds among these keys on one occasion.

At the heron rookery on Crawl Key, near the mouth of the Chassahowitzka River, we observed several hundred Man-o'-war-birds on May 30, 1918. Farther north on the Gulf coast they occur irregularly, chiefly when driven in to shore by high winds. Pennock, at St. Marks, recorded small numbers on September 4 and December 17, 1915; July 5 to 7, and October 18, 1916. Weston has noted a few each year at Pensacola; on July 7 to 9, 1916, after a hurricane on the 5th, he saw companies of 25 or 30 birds in various parts of the bay, and on September 22, 1926, a few days after the violent hurricane that struck Miami, he saw a flock of 26.

On the east coast they occur irregularly in small numbers and, as elsewhere, are likely to be observed during heavy gales. Longstreet noted 12 at Daytona Beach, September 18, 1926, on the day a big hurricane struck the southeast coast of Florida. D. J. Nicholson records 4 seen, September 19, 1926, over a large lake in Orange County; he saw two near the Brevard Island rookery and one at Indian River City, September 29, 1929. At the old pelican rookery near Sebastian, they were reported to occur abundantly from October to the last of December.

HAUNTS AND HABITS.—The Man-o'-war-bird breeds in immense colonies on small oceanic islands. While not regularly migratory, the birds wander between breeding seasons for long distances and take up their abode more or less permanently on some favored key, usually near a heron rookery. They spend much time resting quietly on the mangrove bushes or sailing majestically on widespread pinions high in air. Their flight is perhaps the most marvelous example of perfect adjustment to aerial conditions to be seen in the bird world. The great birds are able to float for hours at any height with scarcely a perceptible motion of the wings. And when an opportunity presents itself

FIG. 1.—NEST AND EGGS OF WATER-TURKEY ON A LIMB 30 FEET ABOVE THE WATER, BLUE CYPRESS LAKE
(Photo by D. J. Nicholson)

FIG. 2.—WATER-TURKEYS NESTING IN A CYPRESS SWAMP IN FORSHALA LAKE, LEON COUNTY
(Photo by H. L. Stoddard)

FIG. 1.—YOUNG WOOD IBISES ON THEIR NESTS AT ALLIGATOR LAKE, NEAR CAPE SABLE. (*Photo by E. G. Holt*)

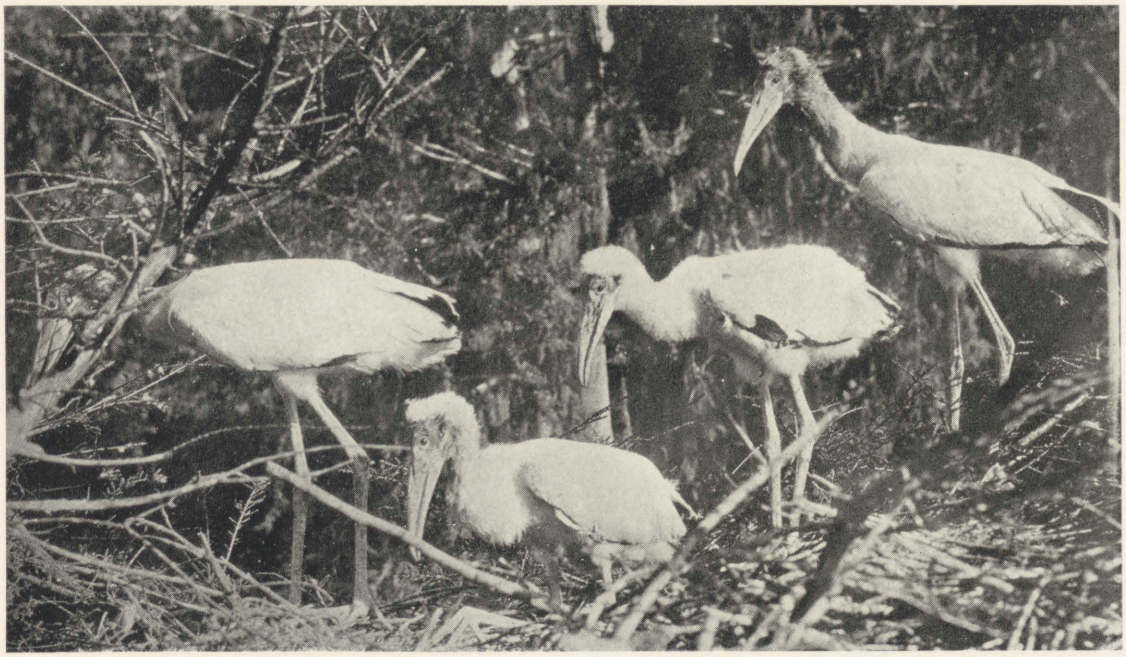

FIG. 2.—YOUNG WOOD IBISES STANDING ON THEIR NESTS IN A CYPRESS TREE IN BLUE CYPRESS LAKE, ST. LUCIE COUNTY. (*Photo by D. J. Nicholson*)

for procuring a meal, they display equally marvelous agility in pursuit of their prey. Bent (1922, pp. 312–313) says of this bird:

> While floating high in the air, almost out of sight, its keen eye detects some morsel of food in the water below it; with wings half closed it shoots downward like a meteor, and so accurately does it gauge its speed and distance that, just as it seems as if it must plunge like a falling arrow into the water, it checks its momentum with a marvelous twist of its great wings and lightly picks up the morsel from the surface without wetting a feather.

The Man-o'-war-birds pick up flying fishes, jellyfishes, and other creatures found on the surface of the sea, but they never alight on the water. Most of their food, however, is obtained by robbing boobies, pelicans, cormorants, gulls, and terns, and sometimes members of their own species.

FOOD.—Since the Man-o'-war-bird procures a large part of its food by robbing other birds of their prey, it is impossible to say to what extent it may influence the supply of valuable fishes. The food fishes are in the main deep-swimming species and thus free from attacks by these birds, which are incapable of diving deeply. Of 25 stomachs of this species examined, 13 contained menhaden; other fishes found in small quantities were pinfish, sea catfish, and weakfish. Würdemann (1861, p. 426) reports finding a mullet and a flying fish in the stomach of a bird killed on the Tortugas. Watson (1908b, p. 212) captured several birds on the Tortugas and forced them to disgorge; the staple food was found to be flying fish, but fairly large herrings and mullets were sometimes taken. Watching the tern colony from a blind, he noticed no attempt by the Man-o'-war-birds to disturb the young terns or take their food.

HERONS, EGRETS, AND BITTERNS: FAMILY ARDEIDAE

GREAT WHITE HERON: *Árdea occidentâlis* Audubon

OTHER NAME: Great White Crane

RECOGNITION MARKS.—About the size of the Great Blue Heron (length, 54 inches; spread, 83 inches). Plumage pure white; bill yellow, greenish at tip; legs yellow, greenish in front. (Plate 19.)

RANGE.—Southern Florida, Cuba, Jamaica, and Yucatan.

DISTRIBUTION IN FLORIDA.—The principal home of this Heron is on the Florida Keys, where it nests on many of the smaller islets, from Oyster and Palm Keys, near Cape Sable, south to Indian, Torch, Cudjoe, and Marquesas Keys. Usually only a few pairs are found on a single key, but on Content Keys Bartsch noted a small rookery, May 11, 1922.

There are a few instances of its nesting on the mainland, as far north as Tampa Bay, and stragglers have been recorded even farther north. A pair nested in a slough in the Royal Palm State Park in March, 1916, and raised one young. (Howell, 1921, p. 254.) Dick Myers stated to C. J. Pennock in 1922 that one or two pairs nested every year in Fakahatchee Bay. A set of three eggs, now in the United States National Museum, was taken at Johns Pass, on the west coast, April 4, 1874. J. J. Ryman collected a set of 3 eggs in a heron rookery near Tampa, April 10, 1895. Pearson (1907, p. 6) records 7 birds seen in the Tampa Bay rookery (near St. Petersburg) on April 11, 1906, "but two

nests examined revealed no eggs." In a later paper (1923a, p. 74) he states that there were four nests there on the above date, one of which contained 3 eggs; the others were not examined. This species does not breed there regularly, however, for several visits in later years by different observers, including the writer, have failed to show any of the birds present.

A specimen was taken by J. J. Ryman prior to 1917 at the north end of Lake Worth. One individual was seen by the writer near Kelsey City, April 21, 1923, and another on the Palm Beach Canal in the Everglades, April 15, 1923. John B. Semple noted 10 individuals along the Tamiami Trail, April 17, 1931. Two specimens in the Museum of Comparative Zoölogy were obtained on Cedar Keys, January 1 and July 1, 1883. An immature bird was taken by A. H. Hardisty at Naples, April 1, 1919, and Alexander Wetmore saw one bird near Cortez, January 27, 1919. William Palmer (1901, p. 133) records several seen at Cypress Lake, near Orange Hammock, on the Kissimmee River, February 26, 1895. H. L. Stoddard collected a specimen on Lake Jackson, Leon County, October 4, 1925, after the bird had been seen a number of times in the vicinity during August and September. O. C. Van Hyning observed one individual near Gainesville, May 9, 1926, and R. J. Longstreet saw one near Brevard Island, Mosquito Lagoon, January 23, 1927.

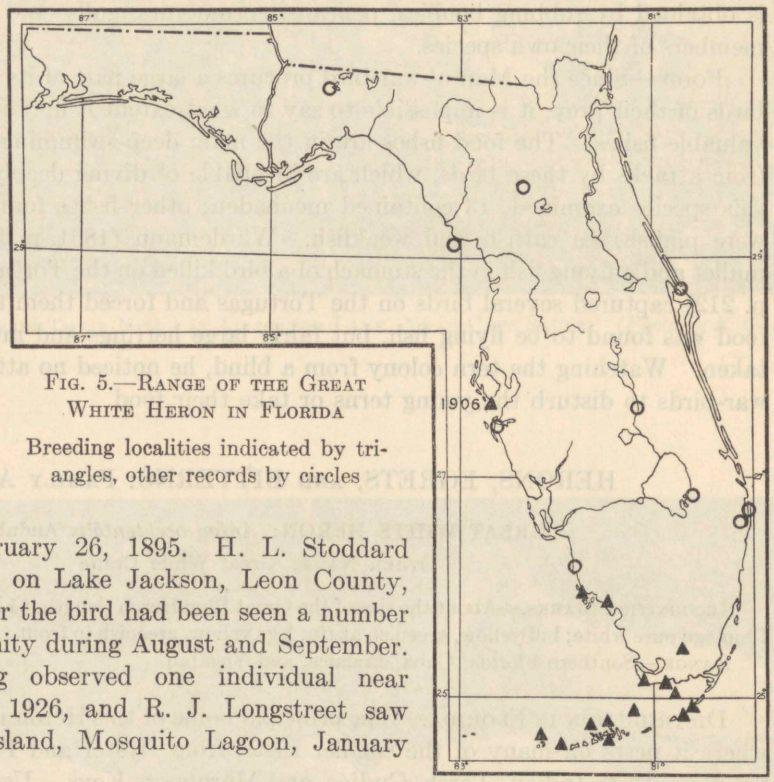

FIG. 5.—RANGE OF THE GREAT WHITE HERON IN FLORIDA

Breeding localities indicated by triangles, other records by circles

HAUNTS AND HABITS.—This splendid species, the largest of the American herons, is a characteristic resident of the shallow waters of the Bay of Florida, where it is not unusual to see 40 or 50 of the giant birds at one time, standing belly deep in the water, motionless as statues, awaiting the approach of their prey. They are constantly alert and exceedingly shy, so that it is quite useless to attempt to approach near them under such conditions. They fly deliberately with steady strokes of the long wings, and when alarmed, usually put a considerable distance between them and their pursuer before alighting. When not seeking food, they may be seen roosting in the mangrove trees which fringe all the keys in their chosen habitat.

The nesting season covers practically the entire year, but most of the eggs are laid

during December and January. Nestlings have been observed on the Florida Keys during July, August, September, November, December, January, and February; and eggs have been taken in all months from December to June. The nests are shallow, flat platforms of sticks about 3 feet in diameter, placed most frequently from 10 to 20 feet above the ground in black mangrove trees. The eggs number 3 or 4 in a clutch, and are indistinguishable from those of the Great Blue Heron.

The bird described by Baird (1858, p. 669) as Würdemann's Heron, now believed to be a hybrid form, is found chiefly in Florida Bay, the principal breeding place of the Great White Heron. Nests containing both white and blue young have been discovered in this region by several observers, including Chapman (Bent, 1927a, p. 97) and Holt (1928, pp. 11–13); these instances are believed to indicate hybridization with Ward's Heron.

Food.—Nine stomachs of this Heron from Florida have been examined; all contained fishes, mostly species of no value to man. Toadfishes (*Opsanus tau*) were found in 5 stomachs, one bird having taken 27; other species eaten were porcupine fish, pipefish (*Siphostoma*), one porgy, and one mullet, the last two being the only food fishes consumed. Every one of these stomachs contained shrimps or other crustaceans, chiefly *Peneus brasiliensis*, and 5 contained small gastropods of several species. In the stomach of an adult taken at Royal Palm Hammock was a garfish, 12 inches long. Fowler (1906, p. 397) mentions finding a sheepshead (*Archosargus*) about 10 inches long in the stomach of a specimen killed on Sugar Loaf Key. Holt states that nearly fully fledged nestlings on Buchanan Keys, December 28, 1923, disgorged masses of shrimps.

WARD'S HERON: *Árdea heródias wârdi* Ridgway

Other Name: Blue Crane

Recognition Marks.—Length, 50 to 52 inches; spread, 77 to 82 inches; wing, 18.50 to 20.40 inches; bill, 5.5 to 6.5 inches. *Adult:* Middle of forehead white; sides of crown and occiput black, the feathers lengthened; throat and sides of head white; neck light drab, streaked with black in front; back, wings, and tail dark smoke gray, the primaries dark plumbeous; underparts mixed black and white; legs tawny. (Plate 19.)

Würdemann's Heron (*Ardea würdemanni* Baird), believed to be a hybrid between *Ardea herodias wardi* and *Ardea occidentalis*, differs from Ward's Heron in having the entire head and occipital crest feathers white, the forehead streaked with fuscous; the underparts white streaked with fuscous.[1] (Plate 19.)

Range.—Southeastern United States, breeding from Kansas, Iowa, southern Illinois, southern Indiana, and southern South Carolina south to the Florida Keys and the Gulf coast as far as Brownsville, Texas. Winters in Florida, southern Alabama, Texas, and in Mexico south to Jalisco.

Distribution in Florida.—Occurs commonly throughout the entire State, nesting in both large and small colonies and sometimes singly. In the Indian Key rookery in Tampa Bay, about 25 pairs were breeding in 1918, 30 or 40 pairs in 1919, and about 70 pairs in 1924. In May, 1915, B. J. Pacetti estimated that there were 150 nests on the Passage Key Reservation; since that time this key has been almost washed away by a hurricane. At Little Mud Lake, Orange County, there was a rookery containing about 35 nests in 1911 and there is said to be a large rookery in a cypress swamp near Oak Hill.

[1] See Baird, 1858, p. 669, and Holt, 1928.

R. J. Longstreet reports a considerable colony of these Herons breeding on Brevard Island, in the southern end of Mosquito Lagoon, recently occupied by the Brown Pelicans. H. L. Stoddard reports about 12 pairs in a rookery at Forshala Lake, Leon County, and 15 or 20 pairs in May's Pond, near Lake Miccosukee, and E. G. Holt mentions a rookery containing about 50 nests in a cypress swamp at Micanopy Junction.

Small colonies of Ward's Herons are known to nest at St. Marks, Fort Bassenger, Seven Oaks (near Safety Harbor), on the St. Johns River marsh (west of Fellsmere), Pine Island, and many of the small keys near Cape Sable. The species has been reported in small numbers on most of the Florida Keys from Key Largo to Key West, the Marquesas Keys, and the Tortugas. On Boca Grande Key, January 6, 1919, Bartsch noted about 100 birds and many empty nests.

Nearly all the records of the hybrid form known as Würdemann's Heron are from the Florida Keys; one individual was observed, however, by Dr. E. W. Nelson, March 31, 1923, on the Kissimmee Prairie about 12 miles northwest of Okeechobee. The bird was standing in a little marshy spot on the prairie, where it remained without alarm while Doctor Nelson's car passed within 100 yards.

HAUNTS AND HABITS.—Florida furnishes an ideal home for this big Heron, and it is found in a variety of situations, chiefly along the borders of rivers and lakes, on the marshes (both fresh and salt), and in the shallow waters of the Gulf and the Indian River. The birds seek their food in shallow ponds, lakes, or bays, standing knee deep or more, awaiting the appearance of their prey or wading deliberately through the water. They are constantly alert for any sign of danger, and at the first alarm take flight and wing their way to a place of safety.

The nests are placed in many different situations, but if tall trees are available, these are usually chosen. In the cypress swamps, where many rookeries are located, the nests are often placed from 50 to 100 feet above the ground. In the rookeries along the Gulf coast the nests are located in the tops of the black mangrove trees; on Palm Key, off Cape Sable, about 10 nests were found placed about 8 feet above the ground in the lower branches of the mangroves. In the St. Johns marshes we saw several nests in low bushes, and on the Kissimmee Prairie Nicholson observed several in cabbage palm and oak trees in a hammock. (Plate 11.)

This species begins to nest in November or December and continues until April. Asa Pillsbury reported eggs in the nests at Passage Key on November 15, 1912, and R. D. Hoyt took 9 sets of eggs at Seven Oaks on January 2, 1907. D. J. Nicholson examined a rookery at Little Mud Lake, Orange County, on January 26, 1913, at which date many nests contained young and some 3 or 4 eggs. Fresh eggs were found near Tampa, April 10, 1895. In the Forshala Lake rookery (Leon County) young were nearly full grown on May 9, 1926.

Settlers on the canals in the Everglades complain of these Herons as very destructive to chickens, picking up small young ones as fast as they can swallow them. Maynard (1895, p. 169) tells of seeing a Ward's Heron on the Indian River in 1885 carrying a rat in its bill. Firing at the bird caused it to drop the rat, which proved to be a specimen of *Neofiber alleni*, at that time known only from the type specimen, described the previous year.

GREAT BLUE HERON: *Árdea heródias heródias* Linnaeus

RECOGNITION MARKS.—Closely resembles Ward's Heron, but is smaller and slightly darker. Length, 42 to 47 inches; spread, 70 to 75 inches; wing, 17 to 18.90 inches; bill, 4.84 to 5.94 inches.

RANGE.—Eastern United States and southern Canada. Breeds from central Alberta, southeastern British Columbia, southern Saskatchewan, central Manitoba, northeastern Ontario (James Bay), and southern Quebec south to Iowa, Illinois, Indiana, eastern Tennessee, and South Carolina. Winters from New York southward to Florida, Texas, Tamaulipas, and the Bermuda Islands.

DISTRIBUTION IN FLORIDA.—Occurs only in winter, and known at present only from specimens taken at St. Marks (January 20, 1919); Gainesville;[1] Lake Harney (December 3, 1895);[1] Oak Lodge, opposite Micco (February 1, 1895);[1] and Pass-a-Grille. Probably this race is not uncommon in winter in northern and central Florida.

FOOD.—According to Audubon (1835, vol. 3, p. 91):

> The principal food of the great blue heron is fish of all kinds; but it also devours frogs, lizards, snakes, and birds, as well as small quadrupeds such as shrews, meadow mice, and young rats, all of which I have found in its stomach. Aquatic insects are equally welcome to it, and it is an expert flycatcher, striking at moths, butterflies, and libellulae, whether on the wing or when alighted. It destroys great numbers of young marsh-hens, rails, and other birds. . . .

A study by E. A. Chapin in the Biological Survey of the contents of 70 stomachs of this Heron gave the following results: Fishes formed about 60 per cent of the total contents; crustaceans, about 14 per cent; insects, nearly 9 per cent; frogs, salamanders, and snakes, 9.5 per cent; and mammals, mainly field mice, 6 per cent. About half of the fishes eaten were classed as useful kinds—catfish, carp, eels, pickerel, and sunfish; the remaining half included suckers, minnows, killifishes, gizzard shad, and sticklebacks. The insects taken included dragon-fly nymphs, water tigers, giant water bugs, and water boatmen, nearly all of which are very destructive to young fishes. Chapin concludes that it is advisable to control this species at fish hatcheries, but that elsewhere it need not be considered particularly harmful.

AMERICAN EGRET: *Casmeródius álbus egrétta* (Gmelin)

OTHER NAMES: **White Crane; Long-white; Big Plume Bird**

RECOGNITION MARKS.—Smaller than the Great Blue Heron (length, 35 to 42 inches; spread, 50 to 58 inches; bill 4 to 5 inches). Plumage pure white; bill and lores chrome-yellow, the latter tinged with green; *legs and feet black.* (Plates 13 and 21.)

RANGE.—Formerly bred nearly throughout temperate and tropical America, from Oregon, Nevada, Utah, Illinois, Wisconsin, Indiana, and southern New Jersey south to Patagonia. At present the breeding range is much restricted and the colonies are small and scattered, mainly from North Carolina, South Carolina, Florida, southern Louisiana, and Arkansas southward; also in Oregon and California. After the breeding season many birds wander northward and have been reported from many points in New England, New York, New Jersey, Pennsylvania, Ohio, and Indiana.

DISTRIBUTION IN FLORIDA.—In the early days, before the development of the millinery trade in aigrettes, this species doubtless bred in abundance throughout the State wherever conditions were suitable. At present, its range is much restricted, and the colonies are greatly reduced in size. It probably never occurred in large numbers in northwestern Florida, and at present is reported very rare and accidental in the Pensa-

[1] Recorded by Oberholser, Proc. U. S. Nat. Mus., vol. 43, p. 537, 1912.

cola region. It breeds, however, in considerable numbers at Forshala Lake, Leon County, and in May's Pond, near Lake Miccosukee. H. L. Stoddard records about 50 pairs in each of these rookeries. Grimes (1931, p. 41) reports a colony of about 125 birds nesting in the northeastern corner of Duval County. In 1911, 66 pairs were noted breeding in Orange Lake Reservation, and in 1929 the colony had increased to 150 pairs. Egrets formerly bred in abundance at Anclote Keys (1880), Johns Pass (1880), Lake Ashby (1877), Lake Gentry (1885), and doubtless at many other points in central Florida. At present there is a good-sized colony in the reservation on Indian Key, Tampa Bay, which, owing to the protection afforded it by the Biological Survey, is apparently increasing from year to year. In 1913, the number nesting there was estimated by the warden at 30 pairs. I estimated there were 40 pairs there in 1918, and about 250 pairs in 1925. There is a rookery on the Miakka River that was estimated by Warden Pacetti in 1915 to contain 150 nests. C. J. Pennock reports a colony of 50 or more birds in Puzzle Lake, south of Deer Park, in 1924; D. J. Nicholson estimated there were 60 to 75 pairs breeding in the Island Pond rookery, near Maytown, in April, 1929. In the marshes west of Fellsmere, in May, 1929, A. H. Hardisty found from 50 to 100 pairs nesting in a mixed colony of other herons, ibises, and Anhingas.

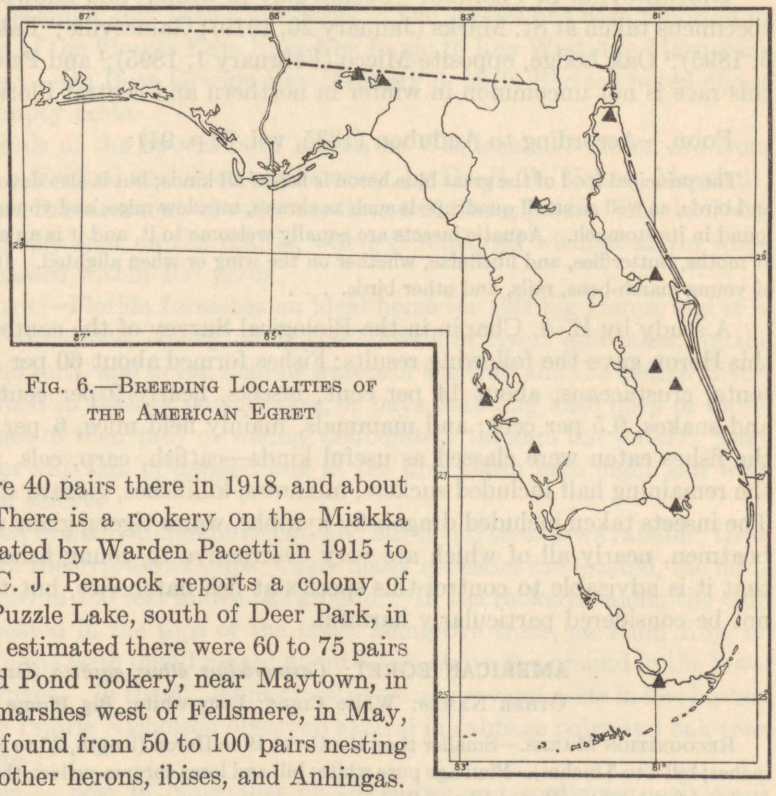

FIG. 6.—BREEDING LOCALITIES OF THE AMERICAN EGRET

In southern Florida, near Cape Sable, there were several large colonies of Egrets, but through lack of adequate protection these have suffered serious decimation. The Cuthbert Lake rookery was reported by Chapman (1913b, p. 17) in 1908 to contain between 300 and 400 nests. At the Alligator Lake rookery, the species was said to be abundant in 1903 (Bent and Job, 1904, p. 129), but on the occasion of our visit to the lake on March 31, 1926, we saw only about a dozen birds flying about and found no nests. Doubtless there are other nesting colonies in the vast wilderness of the southwest coast or in the Everglades.

These Egrets winter in small numbers around the lakes in Leon and Jefferson Counties and, of course, in larger numbers throughout peninsular Florida. Large numbers were seen by B. H. Christy along the Tamiami Trail in the southern Everglades, February 20 to 21, 1927.

HAUNTS AND HABITS.—The American Egret breeds in colonies with other species of herons in cypress or mangrove swamps or in secluded ponds in which trees and bushes grow. Occasionally the nests are placed in bushes only a few feet above the water, but usually they are in or near the tops of medium-sized trees, from 20 to 40 feet above the ground. They are not bulky, but are more substantial than those of the smaller herons, built of sticks and lined with Spanish moss. The eggs, usually four in number, are pale blue and somewhat pointed at both ends.

Nesting begins in some colonies as early as January and may continue into May or June.[1] In a colony of about 50 pairs, discovered on the Kissimmee Prairie, near Kenansville, January 26, 1930, by Wray H. Nicholson and J. C. Howell, Jr., all the nests examined held eggs, some of them partly incubated. Eggs were found at Lake Okeechobee, February 4, 1896 (D. D. Stone, 1896, p. 132); Seven Oaks (near Clearwater), March 1, 1909; Duval County, March 2, 1930; Puzzle Lake, March 29, 1924; and Maytown, April 7, 1923 (incubated). At the Indian Key rookery in Tampa Bay, Bent noted eggs on March 11, 1925; on April 17 all the nests contained young from a few days to two weeks old.

After the breeding season, these Egrets scatter apparently in all directions over the country, feeding in marshes, bayous, ponds, and the margins of lakes and streams, but gathering at night into a common roost. In regions where they are afforded protection, they become remarkably tame and are a source of great interest to tourists and nature lovers. Their note is a harsh, rattling croak, but their snowy white plumage and graceful form make up in attractiveness for their lack of voice. The young, when awaiting the approach of their parents, utter a continuous, froglike clacking.

FOOD.—Few data on the food habits of the American Egret are available. The stomach of one Florida bird examined in the Biological Survey contained 3 sunfish, and that of two others contained unidentified fragments of fish bones and scales. One bird from Alabama had taken 3 gizzard shad about 5 inches long. Baynard (1912a, p. 169) recorded the contents of 50 meals of young birds at Orange Lake as consisting of 297 small frogs, 49 small snakes, 61 small fishes, and 176 crawfishes.

SNOWY EGRET: *Egrétta thúla thúla* (Molina)

OTHER NAMES: **Snowy Heron; Little Plume Bird**

RECOGNITION MARKS.—Smaller than the American Egret (length, 20 to 28 inches; spread, 34 to 44 inches; bill 2.5 to 3.5 inches); bill black, the basal portion and lores yellow; legs black, *the toes yellow*. (Plate 13.)

RANGE.—Bred formerly from southern Indiana and southern New Jersey south to Chile and Argentina; now breeds locally in the United States from North Carolina south to Texas, Louisiana, and Florida. The winter range is from South Carolina, southern Georgia, and the coasts of Louisiana and Texas southward. Many of the birds occur during spring and summer at points considerably north of their breeding range; they have been recorded from Alberta, British Columbia, Ontario, Nova Scotia, Vermont, Massachusetts, Connecticut, New York, Ohio, Iowa, Wisconsin, Kansas, Nebraska, Wyoming, and Colorado.

[1] There is a set of eggs in the United States National Museum collection from Lake Jessup, Fla., taken December 8, 1859, and one from Gainesville, taken June 14, 1893.

DISTRIBUTION IN FLORIDA.—The Snowy Egret was formerly an abundant breeder over the greater part of Florida. It is still found, though in greatly reduced numbers, in nearly all sections where favorable conditions exist. Bryant, in 1859, reported it breeding commonly at Pelican Island, in the Indian River; Merriam, in 1874, recorded it common on the Oklawaha River; it was said to be an abundant breeder on the Caloosahatchee River in 1877, at Johns Pass and Anclote Keys in 1880, and at Lake Gentry in 1885. The great demand for plumes began about 1885, and this species was among the first to suffer serious decimation. In recent years, with the passage of prohibitive laws and with an enlightened sentiment against the use of feathers for decoration, these charming birds have shown a considerable increase and may now be found in many of their old haunts. Snowy Egrets were reported breeding at Chipley in 1903, on Miakka River in 1915, and on Passage Key in 1916. About 20 nests were recorded on Indian Key in 1912, and 38 in the Orange Lake rookery in 1929.

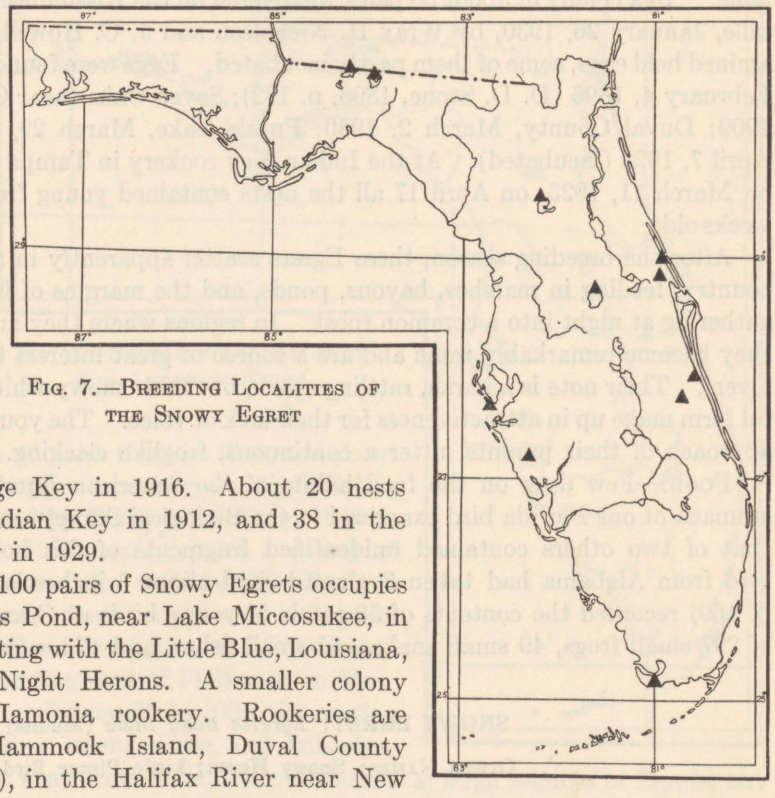

FIG. 7.—BREEDING LOCALITIES OF THE SNOWY EGRET

A colony of 75 to 100 pairs of Snowy Egrets occupies the rookery in May's Pond, near Lake Miccosukee, in Jefferson County, nesting with the Little Blue, Louisiana, and Black-crowned Night Herons. A smaller colony nests in the Lake Iamonia rookery. Rookeries are known on Black Hammock Island, Duval County (Grimes, 1931, p. 42), in the Halifax River near New Smyrna, and in a cypress swamp near Maytown. About 50 pairs nested in 1923 in the rookery in the Sebastian River near Roseland, and these had increased to 200 pairs by 1929. A colony of 75 pairs was reported on Canal Creek, Osceola County, in March, 1929, and another of 200 pairs along a canal near Fellsmere in April, 1928. There are several large colonies in the lakes near Cape Sable, one of which was estimated by John B. Semple in 1931 to contain about 2,000 birds. Many smaller colonies are scattered over the State, and with continued protection the species may soon regain its former numbers. The birds are occasionally observed on the Florida Keys, even as far as Marquesas Key (May 7, 1913) and the Tortugas (April 28, 1859).

HAUNTS AND HABITS.—Like the American Egret, the Snowy Egret nests usually in colonies with other species of herons in the cypress and mangrove swamps and in ponds

A Flock of Flamingoes in the Southern Everglades. (*Photo copyrighted by G. W. Romer; reproduced by permission*)

PLATE 16

FIG. 1.—NEST OF BALD EAGLE IN A LONG-LEAF PINE NEAR LAKE APOPKA. (*Photo by D. J. Nicholson*)

FIG. 2.—NEST AND 6 EGGS OF LIMPKIN IN A MARSH ON UPPER ST. JOHNS RIVER, BREVARD COUNTY; BUNCH OF SNAIL'S EGGS IN FOREGROUND. (*Photo by D. J. Nicholson*)

grown up with buttonbushes. The birds sometimes concentrate to a slight extent, but as a rule their nests are scattered throughout the rookery, often interspersed with the nests of the Louisiana Heron or the Little Blue Heron, and placed mainly on the lower limbs of the trees, from 8 to 12 feet above the water. The nests, made of dead twigs, are of rather flimsy construction; the eggs, 3 or 4 in number, are pale blue and not distinguishable from those of the Little Blue and Louisiana Herons.

Nesting commences late in March or early in April and continues into June or later; eggs have been taken at Seven Oaks (near Clearwater), April 4, 1910; Orlando (12 miles west), April 16, 1928; Lake Kissimmee, April 19, 1908; Gainesville, May 12, 1900; Sebastian River, April 11, 1923; and Tarpon Springs, August 26, 1886. When the young are about half-grown, they begin to clamber about on the limbs near the nest and if one falls to the ground, it immediately starts to climb, using feet, wings, and head, and usually succeeds in reaching a place of safety in a bush or tree.

Snowy Egrets feed in marshes, bayous, ponds, and in the edge of the surf on the ocean beaches. In the fall they gather into roosts with other species, chiefly the Little Blue and Louisiana Herons. Stoddard describes such a roost on Lake Iamonia and states that on October 11, 1925, about 25 Snowy Egrets were seen going to it in the evening. This roost is usually deserted, however, soon after the middle of October. At Lake Jackson, September 28, 1924, Stoddard observed a flock of about 40 Snowy Egrets, with a few Little Blue Herons, following a drove of pigs on a prairie, apparently picking up small grasshoppers startled by the pigs.

Food.—Audubon (1835, vol. 3, p. 319) says:

> The snowy heron, while in the Carolinas, in the month of April, resorts to the borders of the salt-water marshes and feeds principally on shrimps. Many individuals which I opened there contained nothing else in their stomachs. . . . At a later period, they feed on small fry, fiddlers, snails, aquatic insects, occasionally small lizards, and young frogs.

Baynard (1912a, p. 169) records the contents of 50 meals of the young at Orange Lake, Florida, as follows: 120 small suckers, 762 grasshoppers, 91 cutworms, 2 small lizards, 29 small crawfishes, and 7 small moccasins. Apparently this little Egret is a decidedly beneficial species.

REDDISH EGRET: *Dicromanâssa ruféscens ruféscens* (Gmelin)

Recognition Marks.—Larger than the Little Blue Heron, with heavier bill. (Length, 27 to 32 inches; spread, 45 to 50 inches; bill 3.5 to 4 inches.) Basal half of bill, lores, and eyelids pale flesh color; terminal half of bill black; legs and feet blue, the scales blackish; head and neck vinaceous-brown; rest of body and wings neutral gray. A pure white phase occurs.[1]

Range.—The Reddish Egret breeds from southern Texas, Louisiana, and Florida south to Guatemala; also in the Bahamas and the West Indies; it occasionally wanders north of its breeding range and has been recorded in Colorado and Illinois.

Distribution in Florida.—Formerly bred abundantly throughout southern and central Florida, north to Orange Lake. Breeding colonies have been reported at Pelican Island in the Indian River (1859); Sandy Key, near Cape Sable (1850); Johns Pass (1880); Captiva Pass (1890); and Clearwater and Old Tampa Bay (1880). One pair

[1] This phase was named "*Ardea pealii*" by Bonaparte (1828c).

nested in Orange Lake in 1911 (Philipp, 1911, p. 360). About 1890 this species seems to have almost disappeared from peninsular Florida, but more recently it appears to be returning in small numbers. Mrs. Brodhead (1910, p. 190) speaks of the birds as "not uncommon" on Upper Matecumbe Key, in 1906, and T. J. Ashe, warden at the Tortugas Keys Refuge, mentions seeing some there about September 5, 1914. Chapman (1908c, p. 139) records 6 birds seen in the Cuthbert rookery, March 29, 1908. Oscar Baynard reported about five pairs nesting in the Kissimmee River, near Lake Cypress, in 1926. W. G. Fargo stated in March, 1927, that a few of these Egrets were living at that time around Tampa Bay, where he had obtained a specimen.

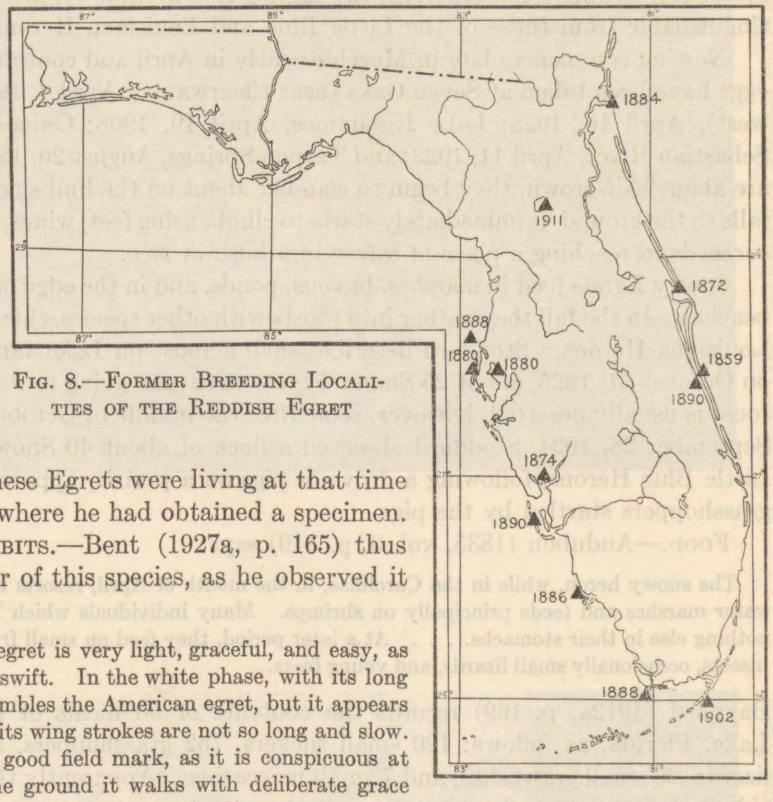

FIG. 8.—FORMER BREEDING LOCALITIES OF THE REDDISH EGRET

HAUNTS AND HABITS.—Bent (1927a, p. 165) thus describes the behavior of this species, as he observed it on the Texas coast:

> In flight the reddish egret is very light, graceful, and easy, as well as strong and rather swift. In the white phase, with its long plumes, it somewhat resembles the American egret, but it appears shorter and stouter and its wing strokes are not so long and slow. Its particolored bill is a good field mark, as it is conspicuous at quite a distance. On the ground it walks with deliberate grace and eloquence. It is an adept on balancing itself on the insecure perches it finds on the slender tops of the bushes, where it nests. . . . Large numbers of the birds may be seen at times standing in the shallow waters around their breeding grounds, or way off on the mud banks or sand shoals in the lagoons, where they stand motionless watching for their prey or walk about slowly in search of it, until the rising tide forces them to leave.

LOUISIANA HERON: *Hydranássa tricolor ruficóllis* (Gosse)

OTHER NAMES: Silver-gray Heron; Lady-of-the-waters

RECOGNITION MARKS.—About the size of the Little Blue Heron (length, 24 to 28 inches; spread, 36 inches; bill 3.30 to 4.15 inches). *Adult:* Head, neck, wings, and tail slate-gray; long feathers on occiput purplish maroon and white; body and under wing coverts white; chin white, the throat marked with tawny. *Young:* Head and neck mostly russet, the wings marked with same. (Plate 13.)

RANGE.—Breeds from North Carolina, central Alabama, Mississippi, and Texas south to the West Indies and Central America and on the Pacific coast of Mexico. Winters from Lower California and South Carolina southward. Stragglers have been recorded late in summer north to New York, Indiana, Manitoba, and California.

PLATE 18

EXPLANATION OF PLATE 18

BIRDS OF THE CYPRESS SWAMPS

Cypress swamps occur at frequent intervals throughout the State. Of the birds commonly found in these swamps, those shown are, at the upper left, four Water-Turkeys—a female with wings spread, a pair sitting just above her, and another male in the distance. At the upper right are two adult and one immature (streaked) Black-crowned Night Herons. Standing in the water are an adult (crested) and an immature Yellow-crowned Night Heron and swimming at the lower right are a pair of Wood Ducks.

FJAQUES

DISTRIBUTION IN FLORIDA.—This is the most abundant heron in the State, and is found in practically all sections, though much less numerous in the northwestern part. It breeds rarely near Pensacola, abundantly near St. Marks, and in moderate numbers in May's Pond, near Lake Miccosukee; it is an abundant breeder in Orange Lake; in Halifax River near New Smyrna; at Pelican Island (near Sebastian); on the St. Johns River marshes, near Fellsmere; in the Sebastian River, near Roseland; at Indian Key, Tampa Bay; in Pine Island Sound and Charlotte Harbor; in Chokoloskee Bay, Cuthbert Lake, and Alligator Lake, near Cape Sable; and, of course, at many other points. Audubon (1835, vol. 3, p. 136) reported it breeding at Key West; Bryant (1859a, p. 17) found it abundant on Sandy Key, April 20, 1850; and Bartsch (1920, p. 208) noted large colonies breeding on Arsenicker Keys and on Newfound Harbor Key, in May, 1919. The birds have been recorded also from several other of the Florida Keys—Boca Chica, Sugar Loaf, Knight's Key, Upper Matecumbe, Key Vaca, and the Tortugas. The colonies at Pine Island, Sebastian River, and Indian Key, Tampa Bay, have each been estimated to number from 1,000 to 1,500 pairs; a count of the last-named colony, however, made in May, 1923, by the warden gave a total of 400 nests.

HAUNTS AND HABITS.—The Louisiana Heron breeds both in the lakes and marshes of the interior and in the mangrove swamps along the coasts, the largest colonies being found in the latter situations. The nests are usually placed in bushes, 2 to 20 feet above the ground, and constructed of sticks or sometimes of rushes. On an island near Shell Point, Wakulla County, however, Pennock (1918a, p. 50) noted a colony of at least 150 pairs nesting in a marsh on "depressed rushes where a high tide had beaten down the tops of the tall, rank growth. . . . The nests were but little more than the scratching aside of the tangled rushes and a few broken pieces of the same laid crossing one another to aid in retaining the eggs from working down."

The birds usually commence to build in March, and the eggs, numbering from 3 to 5, are laid from the middle of March to the first of June, or, rarely, even in August (Tarpon Springs, August 26, 1888). When about two-thirds grown, the young begin to clamber about in the bushes near the nest; they become quite expert as climbers and, if they lose their balance and fall, are able with the aid of their wings and bills to recover themselves and reach the nest again. While in the nest, the young keep up a continual low whining.

These herons procure their food in shallow bayous and ponds in marshes. On the beach at Pass-a-Grille, I observed one feeding along the edge of the surf, crouching low and running for its prey. H. L. Stoddard watched one feeding in shallow water at Lake Jackson; the bird would stand still for a few moments, then suddenly open both wings and run about, spearing fish right and left. After the young are fledged, the colonies scatter widely, and during the summer many wander into the Northern States.

FOOD.—A study by E. A. Chapin in the Biological Survey of the food contents of 48 stomachs of the Louisiana Heron showed that killifishes are the favorite food, these being present in 38 of the stomachs examined and amounting to more than 68 per cent of the total food. Crustaceans, mainly prawns and a few crawfishes, made up 20 per cent of the food. Other items in the stomachs were clam worms, spiders, weevils, grasshoppers, giant water bugs, dragon flies, water beetles, and ground beetles. Only one food fish—a sheepshead—had been eaten.

Baynard (1912a, p. 168), at the Orange Lake rookery, examined the contents of 50 meals of young birds forced to disgorge, and found therein 2,876 grasshoppers, 8 small frogs, 17 cutworms, 6 lizards, and 67 small crawfishes. One adult examined had eaten only grasshoppers, to the number of about 200.

LITTLE BLUE HERON: *Flórida caerúlea caerúlea* (Linnaeus)

RECOGNITION MARKS.—Length, 20 to 25 inches; spread, 36 to 42 inches; bill, 2.70 to 3.50 inches. *Adult:* Head and neck purplish maroon; rest of body and wings dark plumbeous; bill blue at base, black at tip; lores and eyelids blue. *Immature:* Plumage entirely white, except for *grayish markings on tips of primaries.* In changing plumage, the immature birds present a pied appearance. (Plate 13.)

RANGE.—Breeds from Delaware, North Carolina, southern Alabama, Arkansas, and eastern Texas south to Central America (formerly bred north to Missouri, Illinois, and New Jersey). Winters from South Carolina southward, and wanders casually to Colorado, Kansas, Nebraska, Iowa, Wisconsin, Ontario, Quebec, New England, and Nova Scotia.

DISTRIBUTION IN FLORIDA.—An abundant resident in practically all sections; less common in northwestern Florida, but winters in small numbers as far north as Wakulla County (January 6, 1920). Breeding colonies have been reported at Pensacola, De Funiak Springs, St. Marks, May's Pond (near Lake Miccosukee), Gainesville, Orange Lake, Seven Oaks (Pinellas County), Lake Wampee (Orange County), Spruce Creek Swamp (Volusia County), New Smyrna, St. Johns River marshes (near Fellsmere), Sebastian River (near Roseland), Punta Gorda, Lake Worth, and Cuthbert Lake. It is not known to breed on the Florida Keys, but is reported abundant in winter at Upper Matecumbe Key (Brodhead, 1910, p. 190) and as a migrant on the Tortugas (May 14 and 18, 1922; August 15, 1925).

HAUNTS AND HABITS.—The Little Blue Heron favors fresh-water ponds for its breeding grounds, nesting frequently in willow or myrtle bushes growing in water and in the titi[1] swamps of northern Florida. In the interior it breeds sometimes in colonies by itself, but more often with Louisiana Herons and other species. In the mangrove swamps on the coast it is less numerous than in the interior. The colonies usually number from 20 to 50 pairs, but in the large rookery at Orange Lake, Warden M. N. Gist estimated there were 1,500 pairs breeding in 1916. The nests are of the usual flimsy construction common to the herons, placed in bushes over water at a height of 4 to 8 feet. Nesting begins about the middle of March (Fellsmere) and continues until June; eggs have been recorded from Tarpon Springs on August 26 (Scott, 1887b, p. 220). The complement is usually 4 or 5 eggs.

The birds feed by day in swampy situations and are frequently seen about small pools in the timber or on moist pastures with cattle. Their flight is light and graceful. They travel frequently in loose flocks, and at night roost in considerable numbers in clumps of trees on islands or in marshes where they are secure from disturbance. They are silent for the most part, but when alarmed give utterance to a harsh croak. When approaching the nest to feed the young, they have a note which Cordier compares to that of a guinea fowl.

[1] *Cliftonia monophylla.*

PLATE 19

EXPLANATION OF PLATE 19

BIRDS OF FLORIDA BAY

Between the mainland and the Florida Keys is a large area of shallow water with innumerable small mangrove islands which are the home of the Great White Heron and smaller numbers of Ward's Heron. The birds in the foreground are Ward's Heron (upper), Great White Heron (middle), and Würdemann's Heron, the last believed to be a hybrid between the other species, occurring chiefly in this region.

The flying bird is also a Ward's Heron, and in the mangrove are an adult (white) and an immature White Ibis.

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FOOD.—The food of the Little Blue Heron, as shown by the examination of 46 stomachs in the Biological Survey, consists largely of crustaceans (principally crawfishes) and small fishes, the former composing 45 per cent and the latter 27 per cent of the total food. The fishes taken were mainly small minnows and killifishes with a few catfishes and sunfishes. Insects composed 16.5 per cent of the food contents, while frogs, small snakes, and turtles made up 8.5 per cent (E. A. Chapin, Ms).

Baynard (1912a, pp. 168–169), at Orange Lake, Florida, found in the stomach of an adult Little Blue Heron 51 grasshoppers, 2 small frogs, 3 cutworms, 1 small lizard, and the remains of 3 crawfishes. He examined, also, the contents of 50 meals of young birds in the nest, finding 1,900 grasshoppers, 37 small frogs, 149 cutworms, 8 lizards, and 142 small crawfishes. From this evidence it is clear that this Heron is a most useful bird.

EASTERN GREEN HERON: *Butorides virescens virescens* (Linnaeus)

OTHER NAMES: **Poke; Fly-up-the-creek; Indian Pullet; Crab-catcher**

RECOGNITION MARKS.—Smallest of the Florida herons (length, 15 to 22 inches; spread, 23 to 26 inches; bill, 2 to 2.5 inches). *Adult:* Top of head and lengthened crest feathers dark blackish green; sides of head, neck, and fore breast dark vinaceous-brown; chin and throat white, the breast more or less streaked with white; lower parts neutral gray, shaded with drab; wings and tail greenish; lining of wings dark plumbeous. *Young:* Neck snuff brown; underparts white, streaked with hair brown. (Plate 34.)

RANGE.—Breeds from Nova Scotia, Quebec, Ontario, Wisconsin, Minnesota, and North Dakota south to Guatemala and Honduras, and west to Colorado and New Mexico. The winter range is from South Carolina, northern Florida, and southern Texas southward. Wandering birds have been observed in summer in Colorado, New Mexico, and western Texas.

DISTRIBUTION IN FLORIDA.—Breeds throughout the State in suitable situations; withdraws in winter from the northern part, but winters in small numbers as far north as St. Augustine (December 18, 1915), Gainesville (January 4, 1887), St. Marks (December 4, 1918), and Lake Iamonia (January 3, 1916). Longstreet reports it wintering at Daytona Beach, but in less numbers than in summer. Migrants were recorded as arriving at Whitfield, March 19, 1903; Pensacola, March 19, 1916; and Amelia Island, March 23, 1906. Weston mentions a heavy night migration on April 6, 1916.

A large colony, estimated to number 400 pairs, nested in Orange Lake in 1916. About 100 pairs were noted in the Indian Key rookery (Tampa Bay) in 1912. The species is reported to breed also on Sandy Key (near Cape Sable), at Key West, and on Tea Table Key. Scott (1890e, p. 308) recorded it as abundant in migration on the Tortugas during April, and Bartsch noted small numbers there May 14 to 19, 1922, March 16 and September 5, 1923, and August 18, 1925. Bayard Christy observed the species frequently along the Tamiami Trail in the Everglades, February 20 to 21, 1927.

HAUNTS AND HABITS.—The Green Heron is more solitary in its habits than the other small herons, and often nests singly or in groups of a few pairs. Small numbers are frequently found, however, nesting in the large colonies of Louisiana and Little Blue Herons. In Orange Lake, E. G. Holt noted the birds nesting in close association with Boat-tailed Grackles, the nests of the Herons in some cases built on top of the Grackles' nests.

The nests of this Heron are even more frail than those of the other herons, being a shallow platform of small sticks loosely thrown together and placed in a bush or small tree growing in or near water. The eggs, numbering 3 or 4, are laid from late in March to the first of June. Eggs were found at Orange Hammock on the Kissimmee River, March 23, 1895; Jacksonville, April 2, 1930; Gainesville, April 21, 1895; St. Marks, April 4, 1919; Pensacola, May 4, 1924; and Seven Oaks, May 5, 1903.

The Green Heron seeks its food on the borders of marshland or along the banks of ponds and creeks, wading cautiously in shallow water or sneaking along near the water's edge, ready instantly to make a dash for an insect or small fish. With its head drawn back between the shoulders, it looks peculiarly unheronlike. When startled, it flies off in a bewildered fashion, uttering a loud, raucous *skeow*.

Food.—The examination of 202 stomachs of the Green Heron in the Biological Survey, by E. A. Chapin, showed its food to consist of fishes (40 per cent), crustaceans (24 per cent), insects (27 per cent), and a few spiders and snails. Of the fishes eaten, killifishes were the most numerous, being found in 50 stomachs; and 13 other species of little value were identified. Of the valuable food fishes, sunfishes were found in 10 stomachs; pickerel in 4; catfishes in 4; carp in 2; white perch in 1; and eels in several. The crustaceans taken were prawns and crawfishes. The insects eaten included water bugs, water beetles, dragon flies, damsel flies, grasshoppers, crickets, and katydids.

Baynard (1912a, p. 168) found in the stomach of an adult Green Heron at Orange Lake, 6 small crawfishes, 16 grasshoppers, 2 cutworms, and the remains of small frogs.

BLACK-CROWNED NIGHT HERON: *Nycticorax nycticorax hoâctli* (Gmelin)

Other Names: **Grosbec; Quawk**

Recognition Marks.—Larger than the Little Blue Heron, with shorter legs and shorter and stouter neck. (Length, 23 to 28 inches; spread, 43 to 48 inches; bill, 2.75 to 3.15 inches.) *Adult:* Top of head dark blackish green; back and scapulars similar or dark ivy green; several long, slender white feathers grow from occiput; most of body and neck smoke gray, becoming white on chin, throat, and median underparts; wings hair brown, the outer quills drab. *Immature:* Upperparts fuscous, streaked with white; lower parts white, streaked with fuscous or hair brown. (Plate 18.)

Range.—Occurs nearly throughout the Western Hemisphere, breeding from Nova Scotia, Quebec, Ontario, Manitoba, Wisconsin, Michigan, Minnesota, Wyoming, Colorado, Utah, Nevada, and Oregon south to southern Patagonia and the Falkland Islands. In winter it occurs chiefly from North Carolina and central California southward, but in small numbers north to Massachusetts, New York, Illinois, Colorado, Utah, and Nevada.

Distribution in Florida.—A common resident in all sections; reported as breeding at Pensacola, St. Marks, Waukeenah, Lake Miccosukee, Duval County, Archer, Orange Lake, Maytown, Daytona, Chassahowitzka Bay, Anclote Keys, Lake Gentry, Indian Key (Tampa Bay), Lake Worth, and Alligator Lake near Cape Sable. Bent (1904, p. 269) records a flock of 75 birds on one of the Keys, probably nesting. It winters in large numbers at Mosquito Inlet and in smaller numbers at St. Marks and on the Kissimmee River. Bayard Christy found the birds of frequent occurrence along the Tamiami Trail, near Miami, February 20 to 21, 1927. It is not common on the Florida Keys, but has been recorded from Upper Matecumbe, Ramrod Key, Boca Grande, Key West, Marquesas, and the Tortugas (October 3, 1859; April 28, 1914; and May 18, 1922).

HAUNTS AND HABITS.—The Black-crowned Night Heron breeds in ponds and sloughs in the interior and to some extent in the mangrove swamps along the coast, frequently in rookeries occupied by other species of herons, but usually forming a colony more or less by themselves. About 40 pairs breed in the Orange Lake rookery, and more than 100 pairs in the Island Pond rookery, near Maytown. The rather bulky nests are made of twigs, lined sometimes with green leaves, and placed in bushes or trees 4 to 15 feet above the ground, though sometimes barely above the water level. The young birds, while in the nest, keep up a continual cackling during the night accompanied by frequent squawks from the old birds.

Nesting apparently begins in December in southern Florida, for on January 26, 1924, at Alligator Lake, Holt found the young birds well grown and clambering about over the branches outside the nest. In northern Florida, eggs have been noted at Lake Kissimmee, March 6, 1910; San Mateo, March 29, 1882; Seven Oaks, April 11, 1903; Gainesville, April 27, 1895. At the Island Pond rookery, on April 8, 1923, the nests contained young in all stages, from those just hatched to those able to fly.

The Black-crowned Night Heron has a shorter, stouter neck than the other herons, which gives it a quite different appearance. In flight, the neck is shortened, but not folded, and the bird moves with strong, swift strokes of the wings. As its name implies, it is most active at night, particularly in the dusk of evening and from dawn until sunrise. At such times its hoarse *quak* may be heard as the bird flies to or from its feeding grounds. During the day it remains quiet for the most part, perched in a sheltered place in some low tree, but occasionally it may be observed seeking food on a marsh or the reedy bank of a creek.

FOOD.—The examination of the contents of 45 stomachs of this species by W. L. McAtee in the Biological Survey revealed the following items: Fish, 53.87 per cent; crustaceans (mainly crawfishes), 21.42 per cent; insects, 15.92 per cent; frogs, 7.13 per cent; and meadow mice, 1.66 per cent. Fifteen species of fishes were identified, including catfish, suckers, minnows, dace, shiners, carp, gizzard shad, killifish, sunfish, and sticklebacks. The majority of these are of no commercial importance. Baynard (1912a, p. 169) records the food contents of 50 meals of young Black-crowned Night Herons at Orange Lake as follows: 60 crawfishes, 610 small catfishes, 31 small pickerel, and 79 dragon flies.

YELLOW-CROWNED NIGHT HERON: *Nyctanássa violácea violácea* (Linnaeus)

OTHER NAMES: **Grosbec; Quawk**

RECOGNITION MARKS.—About the size of the Black-crowned Night Heron (length, 22 to 28 inches; spread, 34 to 44 inches; bill, 2.5 to 3 inches); bill slightly shorter and stouter. *Adult:* Forehead and middle of crown white (tinged with yellow in the breeding season), with two or more long slender feathers growing from it; head and throat black, with a broad white streak from beneath the eye backward; neck and body neutral gray; back and wings *with long narrow streaks of fuscous-black. Immature:* Similar to young of the black-crowned species, but *generally darker* (clove brown) *above* and *primaries blackish plumbeous* instead of fuscous (not easily distinguishable in life). (Plate 18.)

RANGE.—Temperate and tropical America, breeding from New Jersey, Illinois, Indiana, Missouri, Kansas, and Oklahoma, south to the Bahamas, West Indies, Brazil, and Peru. Wandering birds have been recorded at many points north of the breeding range, as far as Nova Scotia, Ontario (Toronto),

Maine, Massachusetts, New York, Iowa, Nebraska, and Colorado. In winter, most of the birds desert the United States and are found in the Bahamas, Cuba, and Mexico, but a few individuals winter in Florida and southern Texas.

DISTRIBUTION IN FLORIDA.—Breeds commonly in peninsular Florida and on the Florida Keys; locally in small numbers in the northwestern section; retires from the northern part in winter, but occurs at that season from Tampa Bay and the Halifax River southward. The birds have been seen occasionally in the breeding season at Pensacola and St. Marks, but no nests have been found there; they are reported to breed in Leon County, on the Halifax River, lower Suwannee River, and Caloosahatchee River, and at Waukeenah, Orange Lake, Lake Gentry, Tarpon Springs, Maytown, Jane Green Swamp (near Deer Park), and Alligator Lake (near Cape Sable). Scott (1890e, p. 308) found them breeding in abundance on mangrove keys near Key West (March 5, 1890), and Mrs. Brodhead (1910, p. 190) reported them abundant on Upper Matecumbe in the spring of 1906. About 40 or 50 pairs breed in the Indian Key rookery in Tampa Bay. Pearson (1923a, p. 219) noted the birds in great abundance on the lower Kissimmee River late in March and early in April, and C. J. Pennock recorded a flock of about 200 seen at a small willow-grown pond near Fish-eating Creek, Lake Okeechobee, January 15, 1926. The species has been observed several times on the Tortugas, and on Marquesas, Boca Chica, Boca Grande, Sugar Loaf, West Cudjoe, Cottrell, and Riding Keys.

HAUNTS AND HABITS.—The Yellow-crowned Night Heron nests both in rookeries with other species of herons and in solitary pairs on secluded creeks or bayous in the swamps. In the Indian Key rookery we found the nests placed high up in the tallest trees, 30 to 40 feet above the ground, while on the Wacissa River we noted a single nest on a low limb overhanging the stream, about 8 feet above the water. The nests are rather frail, built of dead twigs, sometimes with a few sprays of green leaves. The eggs, usually 4 in number, are laid from March to May (Clearwater, March 24, 1903; San Mateo, April 11, 1893; and Indian Key, Tampa Bay, May 10, 1918; April 9, 1925).

The birds feed commonly during the day and also to some extent at night, frequenting marshes, sloughs, and the banks of creeks and rivers. In appearance they are slenderer and more graceful than the black-crowned species. Usually the adults are rather shy, but when nesting in solitary pairs, they may often be approached quite closely.

FOOD.—Examination of 90 stomachs by E. R. Kalmbach in the Biological Survey showed the food to consist almost wholly of crawfishes, with a few crabs, fish, and aquatic insects. Maynard found their food to consist largely of crabs, while Audubon included in their diet snails, small snakes, lizards, leeches, small mammals, and young birds fallen from their nests.

AMERICAN BITTERN: *Botáurus lentiginósus* (Montagu)

OTHER NAMES: Stake-driver; Thunder Pump; Sun-gazer; Indian Hen

RECOGNITION MARKS.—About the size of a Night Heron (length, 23 to 34 inches; spread, 32 to 50 inches; bill, 2.5 to 3.5 inches). Upperparts and wings various shades of brown, mixed with buff and light gray; underparts pinkish buff, broadly streaked with light brown; a black streak on each side of neck. The birds usually alight on the ground and fly with neck drawn in and legs extended. (Plate 20.)

RANGE.—Breeds from central British Columbia, southern Mackenzie, southern Ungava, and Newfoundland southward to southern California, Nevada, Utah, Colorado, Kansas, the Ohio Valley, and North Carolina; also casually in Florida and other southern States. It winters from British Columbia, Idaho, the lower Ohio Valley, and Virginia south to Cuba, Porto Rico, and Panama.

DISTRIBUTION IN FLORIDA.—The American Bittern is a moderately common winter resident and a rare summer resident. C. A. Mosier found a nest with the bird sitting on it at Royal Palm Hammock, Dade County, in 1917, and D. R. House says that he has seen the nest of this species near Chokoloskee. W. H. Mann, of St. Cloud, tells me that some years ago he observed an American Bittern that lived all summer in the marshes on the eastern side of Lake Hancock. According to W. O. Trumbo, of Zellwood, the bird breeds in the sawgrass marshes at the northern end of Lake Apopka. Baynard (1913a, p. 242) records the finding of a nest near Micanopy, June 15, 1911. He reports, also, that a pair nested during two seasons at Plant City, young birds being seen there the middle of May, 1927. Henry Redding says that the species breeds rarely in the St. Johns marshes, above Lake Washington, where he has several times noted nests.

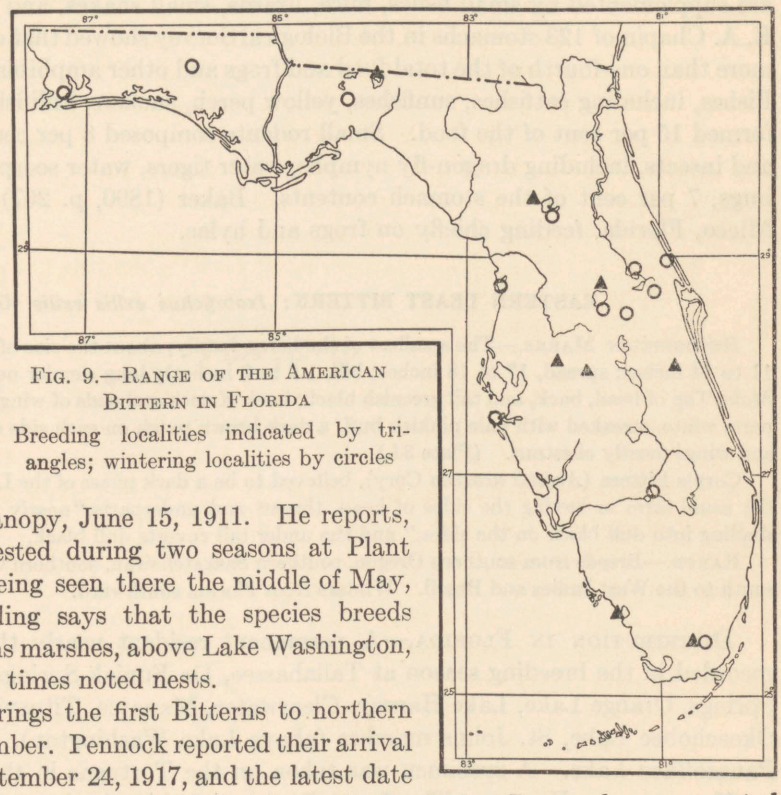


FIG. 9.—RANGE OF THE AMERICAN BITTERN IN FLORIDA

Breeding localities indicated by triangles; wintering localities by circles

Fall migration brings the first Bitterns to northern Florida late in September. Pennock reported their arrival at St. Marks on September 24, 1917, and the latest date of departure in spring as May 10, 1919. The earliest arrival at Pensacola was reported as October 1, 1929, and the latest dates of departure as April 13, 1925, and May 2, 1926. Mrs. Hiram Byrd recorded a bird seen near Bradenton, August 7, 1924. H. L. Stoddard saw one at Shell Point, Wakulla County, September 27, 1925, and one on Lake Miccosukee, June 20, 1926 (probably breeding). Bayard Christy reported the birds numerous along the Tamiami Trail in the Everglades, February 20 to 21, 1927.

HAUNTS AND HABITS.—The American Bittern is a lover of boggy marshes, where it dwells usually in solitude, perfectly concealed in dense rushes. Deliberate and noiseless in its movements, it spends much of its time quietly watching for frogs or small fishes, which it secures with a quick thrust of its powerful bill. The bird is famous for its peculiar notes, heard chiefly during the breeding season, but sometimes in the autumn.

These have been compared to the sound produced by the working of a wooden pump and to that of a stake being struck by an axe. No one knows exactly how these sounds are produced or what their purpose is, but they are accompanied by violent contortions of the bird's head and neck.[1] During the winter season, when the birds are most numerous in Florida, they are likely to be started from the reedy borders of creeks or from ponds on the prairie, as well as from the more extensive marshes. They ordinarily flush at rather close range and fly off with a startled croak to a safe distance.

Food.—Crawfishes and frogs comprise the principal food of the Bittern, and these are supplemented by small fishes, mice, lizards, small snakes, and insects. A study by E. A. Chapin of 128 stomachs in the Biological Survey showed that crawfishes constituted more than one-fourth of the total food and frogs and other amphibians about 16 per cent. Fishes, including catfishes, sunfishes, yellow perch, suckers, killifishes, and sticklebacks, formed 15 per cent of the food. Small rodents composed 8 per cent, snakes 5 per cent, and insects, including dragon-fly nymphs, water tigers, water scorpions, and giant water bugs, 7 per cent of the stomach contents. Baker (1890, p. 267) records the birds at Micco, Florida, feeding chiefly on frogs and hylas.

EASTERN LEAST BITTERN: *Ixobrýchus exîlis exîlis* (Gmelin)

Recognition Marks.—The smallest of the heron family; about the size of a Wilson Snipe (length, 11 to 14 inches; spread, 17 to 18 inches; bill, 1.5 to 2 inches); long slender neck, short wings and tail. *Male:* Top of head, back, and tail greenish black; back of neck and ends of wing coverts chestnut; underparts white, streaked with pale pinkish buff; a dark brown patch on each side of breast. *Female:* Back and wings mostly chestnut. (Plate 34.)

Cory's Bittern (*Ardetta neoxena* Cory), believed to be a dark phase of the Least Bittern, differs from the usual form in having the sides of head, throat, and underparts "nearly uniform rufous-chestnut, shading into dull black on the sides," and the under tail coverts dull black.

Range.—Breeds from southern Oregon, southern Saskatchewan, southern Quebec, and Nova Scotia south to the West Indies and Brazil. Winters from Florida southward.

Distribution in Florida.—A permanent resident nearly throughout the State; recorded in the breeding season at Tallahassee, De Funiak Springs, St. Marks, Tarpon Springs, Orange Lake, Lake Harney, Clearwater, Manatee, Titusville, Fort Lauderdale, Okeechobee Lake, St. Johns marshes (above Lake Washington), Istokpoga Lake, and Panasoffkee Lake. A specimen was taken on the Tortugas in the spring of 1860.

Haunts and Habits.—The Least Bittern inhabits fresh-water marshes, spending most of its life concealed in the dense vegetation of rushes, flags, or saw grass, through which it climbs with the facility of a blackbird. Its extremely narrow body permits it to pass easily through the tangled vegetation. It is rarely seen walking on the ground, but is frequently flushed from the dense marsh grass, at which times it flies rather weakly a few feet above the marsh and soon settles again and disappears from view.

This little Bittern is at all times rather inconspicuous, and if surprised in its marshy retreats, frequently resorts to a concealing pose in which it remains motionless with the bill pointing directly upward and thus resembles closely the reeds among which it dwells.

[1] An excellent description of the notes, by Bradford Torrey, appeared in The Auk, for January, 1889 (vol. 6, pp. 1–8).

PLATE 20

EXPLANATION OF PLATE 20

BIRDS OF THE ST. JOHNS RIVER MARSHES

Near the headwaters of the St. Johns River, in Brevard and Indian River Counties, are extensive fresh-water marshes in which are magnificent growths of water lilies, sawgrass, cattails, and other water plants. Characteristic breeding birds of these marshes are the Everglade Kite, a pair of which is shown at the upper left (the male flying); the Limpkin, shown standing on a floating log; and the Glossy Ibis, two of which (adult and immature) are shown in the foreground.

At the left center is an American Bittern and at the upper right an immature female (left) and an adult male Marsh Hawk, these two species occurring chiefly as winter visitants.

F.J. Jaques

Several observers have described the notes of the male during the breeding season as a succession of low, cooing sounds. Brewster (1902, p. 52) says:

> These notes are uttered chiefly in the early morning and late afternoon, usually at rather infrequent intervals but sometimes every four or five seconds for many minutes at a time. When heard at a distance they have a soft, cuckoo-like quality; nearer the bird's voice sounds harder and more like that of the domestic pigeon, while very close at hand it is almost disagreeably hoarse and raucous as well as hollow and somewhat vibrant in tone. Besides this cooing the least bittern occasionally emits, when startled, a loud, cackling *ca-ca-ca-ca.*

The nest, constructed of dead rushes or other plant stems and sometimes small sticks, is placed in the vegetation of a marsh or pond, slightly above the water. It is a flat nest, often a mere platform, but sometimes quite stockily built. At Indian Rocks, May 17, 1929, I found a nest 4 feet above the water in a mangrove bush. The eggs, numbering from 3 to 5, are laid at any time from the middle of March (March 12, 1895, Gainesville) to the middle of July (July 18, 1920, Apopka Lake, 2 eggs, half incubated).

Food.—The Least Bittern feeds principally upon small fishes, crawfishes, and insects, with a few frogs and, according to Audubon, small shrews and field mice. A study by Alexander Wetmore of the contents of 93 stomachs in the Biological Survey showed that fish remains constituted almost 40 per cent of the total. These included most of the small fishes of the fresh-water marshes, such as top minnows, mud minnows, sunfishes, and yellow perch. Crustaceans, chiefly crawfishes, formed 10 per cent, and aquatic bugs nearly 12 per cent, of the total food. Dragon flies apparently are a favorite food, forming 21 per cent of the total.

WOOD IBISES: Family Ciconiidae

WOOD IBIS: *Mycteria americana* Linnaeus

Other Names: Flinthead; Gourdhead; Ironhead; Gannet; Preacher; Spanish Buzzard

Recognition Marks.—About the size of the Florida Crane (length, 35 to 47 inches; spread, 62 to 66 inches; bill, 6 to 9 inches). *Head and most of the neck scaly, without feathers;* body plumage white; wing quills dark bronze-green, glossed with purple; tail similar but more purplish; easily recognized in flight by the large size, long neck, and white body contrasting with the dark flight feathers. (Plate 21.)

Range.—Temperate and tropical America, breeding from Texas, Florida, and South Carolina south to Argentina and Peru; migrates irregularly after the breeding season to California, Arizona, Montana Wisconsin, Ontario, New York, and New England.

Distribution in Florida.—The Wood Ibis is abundant in many parts of Florida; during the winter season it may be seen in large or small companies wandering about in search of food. Bent (1904, p. 27) says that it is abundant during the winter months all along the Indian River. Audubon (1835, vol. 3, p. 133) speaks of finding a good-sized colony near St. Augustine. The species was said to be breeding commonly at Chipley, in northwestern Florida, in 1904. J. C. Howell, Jr. (1930, p. 114) found a colony near the St. Johns River, in Seminole County, in February, 1930. Many large rookeries are known in central and southern Florida. Nicholson records one in Bay Lake, about 22 miles southwest of Orlando, that in 1913 contained 95 occupied nests, and another on Blue Cypress Lake in March, 1927, containing about 125. Phelps (1912, p. 121) re-

ported thousands of birds breeding in a rookery on Lake Okeechobee and about 5,000 pairs in a colony in the Big Cypress Swamp in Lee County (1914, p. 88). Large colonies are reported in the Okaloacoochee Slough (Hendry County); near Osteen (Volusia County); on Lake Conlin (Osceola County); and in northern Polk County (Bent, 1927a, p. 59).

In one large colony that has occupied a group of mangrove islands in Alligator Lake, near Cape Sable, for many years, E. G. Holt, in January, 1924, counted 230 nests. E. J. Court reports a colony on Flinthead Key, off Cape Sable.

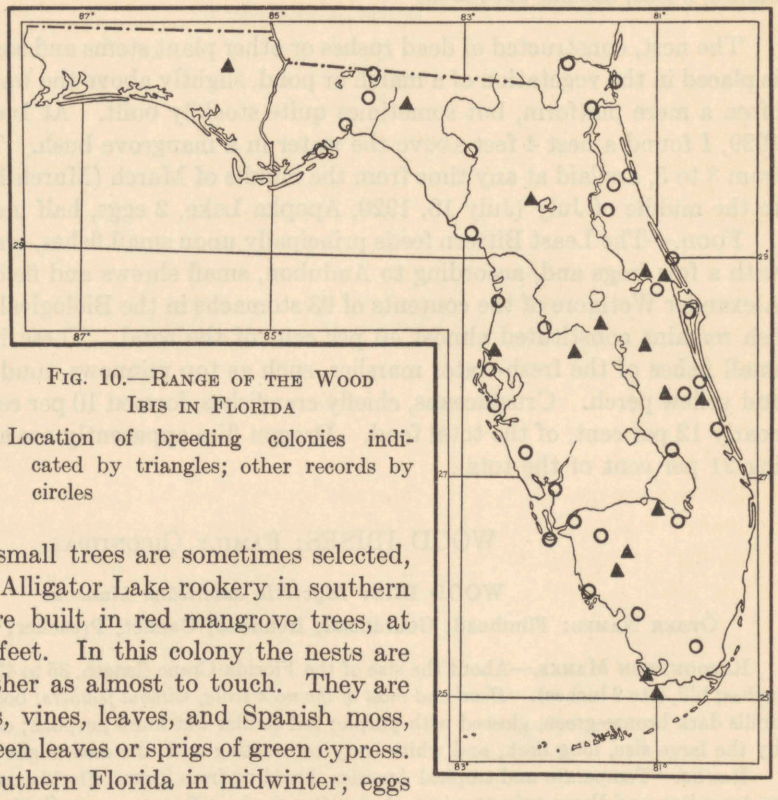


FIG. 10.—RANGE OF THE WOOD IBIS IN FLORIDA

Location of breeding colonies indicated by triangles; other records by circles

HAUNTS AND HABITS.—This strange looking bird—in reality a stork—is strongly gregarious, nesting in large colonies, usually in cypress trees growing in the water. The nests are generally placed in the tops of the trees, which in some cases may be 90 or 100 feet in height; small trees are sometimes selected, however, and in the Alligator Lake rookery in southern Florida the nests are built in red mangrove trees, at altitudes of 6 to 40 feet. In this colony the nests are placed so close together as almost to touch. They are constructed of sticks, vines, leaves, and Spanish moss, and are lined with green leaves or sprigs of green cypress. Nesting begins in southern Florida in midwinter; eggs from Florida, taken December 8, 1859, are in the United States National Museum. On January 26, 1924, in the Alligator Lake rookery, Holt found most of the eggs hatched and some of the young large enough to stand up in the nests. E. J. Court examined the rookery on March 31 of the following year and found most of the eggs about half incubated; on the same date in 1926, I visited the lake, at which time the young were nearly full grown. In a colony of more than 50 pairs near Osteen, examined by J. C. Howell, Jr. on February 12, 1930, most of the nests contained young, some of which were several weeks old. In the Bay Lake rookery in Orange County, on March 12, 1913, Nicholson found eggs in some of the nests, but the majority contained young two or three weeks old (Plate 15). The usual number of eggs in a clutch is two or three, but occasionally there are four, and rarely five.

The Wood Ibis feeds along the shores of the coastal lagoons, in fresh-water marshes,

and in shallow ponds in the forests. The birds visit the ponds in Leon and Jefferson Counties in considerable numbers in midsummer to feed on the fish or other forms of life found there when the ponds are drying out. Audubon (1835, vol. 3, p. 129) has given a graphic description of their method of feeding, as follows:

> To procure its food, the Wood Ibis walks through shallow muddy lakes or bayous in numbers. As soon as they have discovered a place abounding in fish, they dance as it were all through it, until the water becomes thick with the mud stirred from the bottom by their feet. The fishes, on rising to the surface, are instantly struck by the beaks of the Ibises, [and] on being deprived of life, they turn over and so remain. In the course of ten or fifteen minutes, hundreds of fishes, frogs, young alligators, and water-snakes cover the surface, and the birds greedily swallow them until they are completely gorged, after which they walk to the nearest margins, place themselves in long rows, with their breasts all turned towards the sun, in the manner of Pelicans and Vultures, and thus remain for an hour or so. When digestion is partially accomplished, they all take to wing, rise in spiral circlings to an immense height, and sail about for an hour or more, performing the most beautiful evolutions that can well be conceived. Their long necks and legs are stretched out to their full extent; the pure white of their plumage contrasts beautifully with the jetty black of the tips of their wings.

In flight these great birds present an inspiring sight as they soar at great heights on motionless wings, or fly in straight lines with alternate flapping and sailing.

Food.—According to Audubon (*op. cit.*, p. 132), the Wood Ibis subsists principally on fishes, with the addition of frogs, young alligators, wood rats, young rails and grackles, fiddlers and other crabs, snakes, and small turtles.

The stomachs of 4 adult birds collected by Holt at Alligator Lake were examined in the Biological Survey and found to contain chiefly small toothed minnows of five species (*Mollienisia latipinna, Cyprinodon variegatus, Gambusia affinis, Lepomis holbrookii,* and *Adinia multifasciata*). One stomach contained in addition to fishes, 16 seeds of the buttonbush (*Cephalanthus occidentalis*) and one of a species of gum, *Nyssa* (Holt and Sutton, 1926, p. 420).

IBISES AND SPOONBILLS: FAMILY THRESKIORNITHIDAE

EASTERN GLOSSY IBIS: *Plegadis falcinellus falcinellus* (Linnaeus)

Other Name: Black Curlew

Recognition Marks.—Slightly smaller than the White Ibis (length, 22 to 25 inches; spread, about 36 inches; bill, 4.30 to 5.50 inches); head completely feathered (except the lores). *Adult:* Head, neck, fore back, underparts, and part of the wing coverts rich bay; wing and tail several shades of metallic bronze-green and purple. *Immature:* Head and neck fuscous, streaked with white; underparts dark fuscous, slightly tinged with purple. (Plate 20.)

Range.—The Glossy Ibis has a wide range, chiefly in the Eastern Hemisphere (Spain, Hungary, Greece, Persia, and southern China south to southern Africa, Borneo, and Australia). In North America, it occurs locally in southeastern United States, from Louisiana to Florida, and in the West Indies, and casually north to Wisconsin, Michigan, Ontario, Quebec, and Nova Scotia.

Distribution in Florida.—Apparently this species has never been abundant in Florida but recent reports indicate that it is increasing. Maynard (1881, p. 402) reports seeing a flock at Lake Harney "many years ago" and another on the upper St. Johns marshes. Scott (1889a, p. 15) speaks of it as rare in the Fort Myers region and mentions

two specimens taken in the spring of 1886. Hoxie saw the bird on Merritt Island, August 13, 1888, and among the mangrove islands opposite St. Lucie, October 6, 1888. Specimens were taken at the source of the Caloosahatchee River, April 20, 1881; on Lake Flirt in the fall of 1888; one on the Tortugas in the spring of 1860; one in the Cuthbert rookery near Cape Sable in April, 1911; and several on Whitewater Lakes in April, 1916. A small colony of nine pairs bred for a number of years on Bird Island in Orange Lake, but they have not nested there since 1916. Eggs and a pair of birds were taken on an island in Lake Kissimmee, March 25, 1909, by G. R. Rossignol. B. J. Pacetti observed 4 birds on the Kissimmee River, near Fort Bassenger, in May, 1925. A breeding colony of 30 to 40 pairs was reported in 1922 in the marshes of the upper St. Johns River, west of Melbourne; in the same region, May 8, 1923, I saw three birds and found a freshly made nest on a small island. On April 21, 1924, Dr. Thomas Barbour collected two specimens on Lake Washington, and in April, 1927, he saw 29 birds in the marshes south of Deer Park. A. H. Hardisty, in April, 1928, reported about 60 birds in the marshes west of Fellsmere, and on May 8, 1929, he found a colony of 12 pairs in the same region. In March, 1929, D. J. Nicholson noted a flock of 22 birds in the Fellsmere marshes, and on March 29 of that year, Henry Redding found 9 nests of this colony, 5 of which contained slightly incubated eggs. M. S. Crosby observed 30 birds on Lake Okeechobee, January 5, 1926; Dr. Charles W. Townsend and C. J. Pennock saw a flock of about 40 or 50 birds on Lake Hicpochee, February 10, 1926; and John H. Baker noted a flock of 50 or more near Lakeport, March 22, 1930.

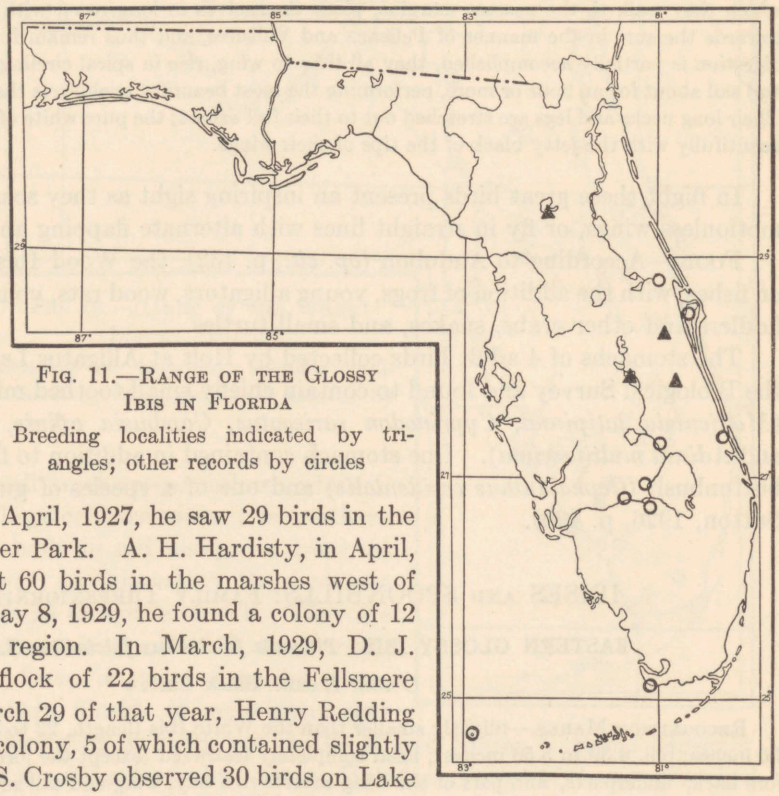


FIG. 11.—RANGE OF THE GLOSSY IBIS IN FLORIDA

Breeding localities indicated by triangles; other records by circles

HAUNTS AND HABITS.—The Glossy Ibis in Florida resorts to the large fresh-water marshes and inland lakes grown up to floating islands—small areas of bog supporting a growth of bushes and subject to frequent displacement by heavy winds or high water. The upper reaches of the St. Johns River, above Lake Washington, furnish vast areas of this type, and here the Glossy Ibis has been known to breed more or less regularly. Similar conditions exist in Orange Lake, Lake Hicpochee, and other lakes in central and southern Florida. Nesting may begin some seasons as early as the last week in March,

but usually the eggs are laid early in May. The birds nest in small colonies among larger colonies of egrets, herons, White Ibises, and Anhingas.

The best account of the habits of this rare bird is that by Oscar E. Baynard (1913b, pp. 103–117), who during four years of intensive study of the Orange Lake colony, examined 26 nests and made careful record of the food items consumed by the young. The following details are taken from his paper: The nests are placed at a height of about 10 feet in thick elder bushes, and are constructed mostly of sticks. Only two days are consumed by the birds in building them. The eggs, 3 or 4 in number, are then laid, and additional material is added to the nests from time to time, as long as they are in use. The first sets of eggs are laid during the latter part of April, these according to Baynard being nearly always destroyed by raiding Fish Crows. The second clutches are laid about the middle or last of May, and these usually hatch successfully and the young are reared. Incubation requires 21 days, both parents sharing in this duty. The young remain in the nest about six weeks before they begin to fly. They are fed by regurgitation, the bill and head of the young bird being thrust down the throat of the parent. Glossy Ibises are pugnacious in their relations with other species, and will drive away any White Ibises or herons that attempt to nest within a distance of 10 feet of their own nest, and gradually dismantle the deserted nests. Among themselves, however, the adults are friendly, and mated pairs spend considerable time in billing and cooing.

Food.—Baynard (1912a, pp. 167–169) kept a detailed record of the food of 4 young from the age of 7 to 30 days, by making the birds disgorge their meal immediately after being fed by their parents. The food consisted principally of crawfishes, cutworms, grasshoppers, and other insects, and young snakes (including the poisonous cottonmouth moccasin). The total contents of 194 meals examined were as follows: 1,964 grasshoppers, 1,391 crawfishes, 412 cutworms, and 147 snakes. Baynard's opinion is that the Glossy Ibis has "a clear record of 100 per cent of good; not a bad thing can be laid to his door."

WHITE-FACED GLOSSY IBIS: *Plegadis guaraúna* (Linnaeus)

Other Name: **Black Curlew**

Recognition Marks.—Similar to the Glossy Ibis, but *feathers bordering the base of the bill, all around, white.*

Range.—Chiefly in western North America, from southern Oregon south through Mexico to South America; east to Louisiana; and casually north to British Columbia, Wyoming, and Nebraska.

Distribution in Florida.—There is one record from Florida, a bird taken, with a set of eggs, near Lake Washington, April 18, 1886. This specimen is now in the collection of the Museum of Comparative Zoölogy, Cambridge, Massachusetts, and has been recorded by Brewster (1886c, p. 481).

WHITE IBIS: *Guára álba* (Linnaeus)

Other Names: **White Curlew; Spanish Curlew; Stone Curlew**

Recognition Marks.—Length, 24 to 27 inches; spread, 37 to 40 inches; bill, 4 to 6.5 inches, *curved downward. Adult:* Entire plumage white except tips of primaries, which are blackish, glossed with steel blue; bill, bare skin of face, legs, and feet bright carmine or orange-red (according to season). *Immature:*

Head and neck hair brown, streaked with dull white; fore back, wings, and end of tail fuscous, the under wing coverts and axillars white; underparts, lower back, and rump white. (Plate 22.)

RANGE.—Breeds in North and South America, from South Carolina, Texas, Louisiana, and Lower California south to the West Indies, Venezuela, and Peru. Occurs casually north to South Dakota, Illinois, and New England.

DISTRIBUTION IN FLORIDA.—The White Ibis is an abundant resident throughout the greater part of Florida, most numerous in the central and southern parts of the State. In the northwestern part, it is reported as breeding in moderate numbers at Pensacola, Chipley, Whitfield, St. Marks, Waukeenah, and Lake Iamonia. In central Florida there are large nesting colonies at Orange Lake; Seven Oaks (near Safety Harbor); Indian Key (Tampa Bay); Ocoee; Island Pond, near Maytown; Green Swamp, near Eva; in the Sebastian River, near Roseland; and in the marshes northwest of Fellsmere. In the southern part, rookeries are reported in Lake Worth; near East Hinson Grove (southwest of Immokalee); on upper Harney River; at head of Shark River; and at Alligator Lake, Cuthbert Lake, and Mud Lake, near Cape Sable. Audubon (1835, vol. 3, pp. 173–175) reports the White Ibis breeding abundantly on Sandy Key near Cape Sable, and L. B. Hunt mentions a few seen on the Marquesas Keys. E. J. Court, on March 28, 1925, saw great flocks flying from the mainland at Cape Sable to the near-by keys to roost.

Some idea of the numbers of these birds may be gained from the estimates of different observers. Pearson (1911b, p. 339) noted about 4,000 nests at Orange Lake, in 1911; Warden Kroegel estimated there were 5,000 birds nesting on the Sebastian River about 1910; and Warden Pillsbury reported about 6,000 birds on Indian Key, Tampa Bay, on June 15, 1915, which, of course, included the young raised that season. One of the largest nestings of which we have any record is at the head of Shark River; Frederic C. Walcott visited this colony in March, 1923, and estimated that there were 6,000 nests in the rookery, which covered an area of mangrove swamp three-eighths of a mile long and about 250 feet wide. Baynard (1914e, p. 19) describes a roost in the Big Cypress Swamp, which he estimated to contain 100,000 birds.

HAUNTS AND HABITS.—The White Ibis is strongly gregarious, associating in flocks at all seasons and nesting in large colonies. The rookeries are located in ponds, sloughs, or marshes, the nests being built in bushes or small trees growing in the water, or sometimes in saw grass, which is beaten down to form a support for the nests. In a small colony nesting in bay trees on small islands in a pond at Ocoee, Nicholson noted several nests built *on the ground*, among the roots of the bay trees. Frequently the nests are so close as almost to touch one another. They are loosely constructed of dead twigs and lined with green leaves and Spanish moss. The eggs, numbering 3 or 4 (rarely 2 or 5), are greenish white, handsomely marked with various shades of brown. Always, so far as known, White Ibises are associated in their rookeries with various species of herons, though usually building in a section by themselves.

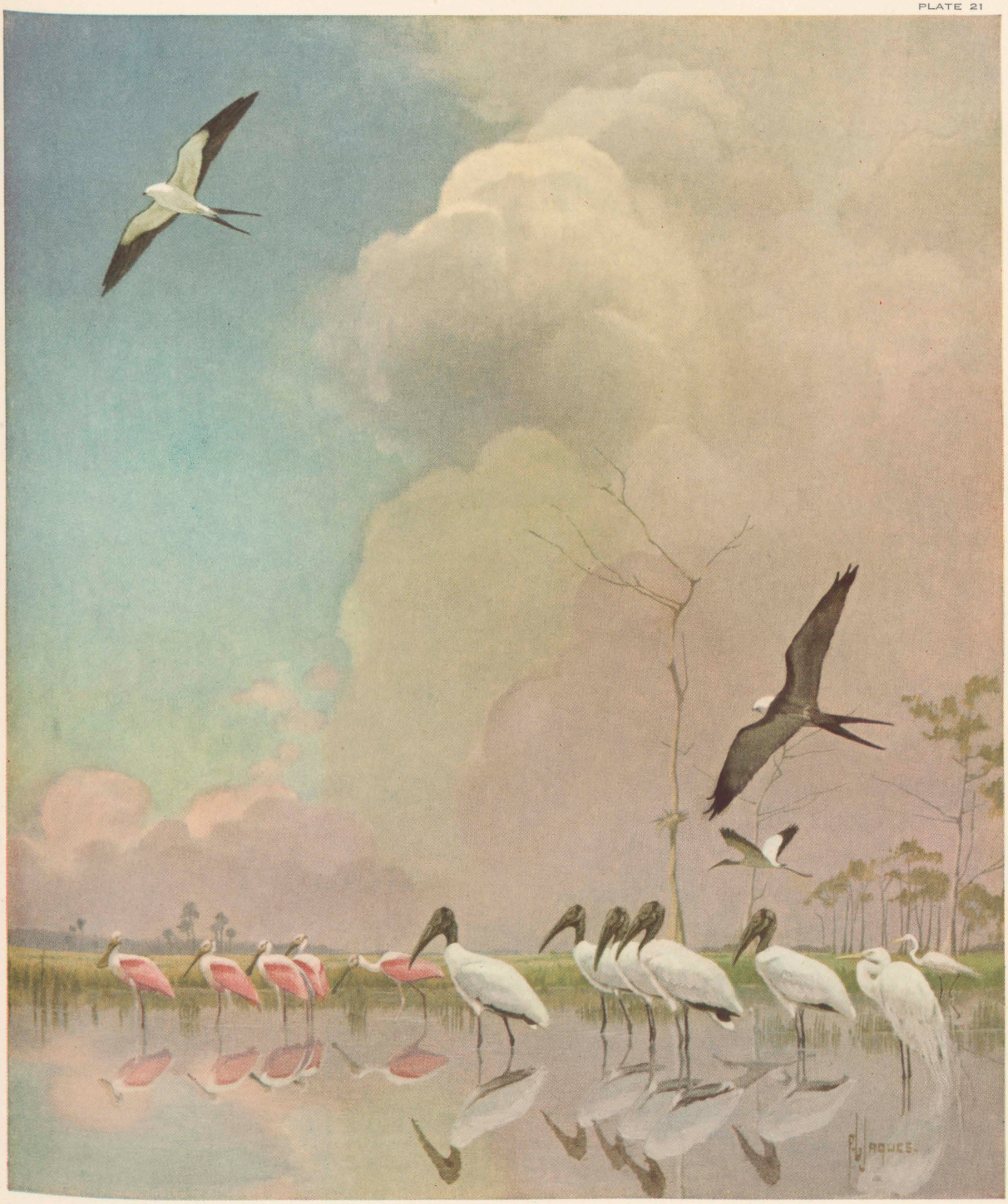
The birds are likely to move more or less from year to year to new locations, since their habit of building their nests in close proximity to other nests often results in killing the bushes on which they are built. The nesting season varies with different colonies, and in different years. At Mud Lake, near Cape Sable, Court found the White Ibis nesting abundantly on March 31, 1925, while at Cuthbert Lake, Bent noted fresh eggs

PLATE 21

EXPLANATION OF PLATE 21

BIRDS OF THE SOUTHERN EVERGLADES

In extreme southern Florida the Everglades merge gradually into a region of mangrove sloughs; here the Roseate Spoonbill (five shown at lower left) was formerly abundant and is now making its last stand. The Wood Ibis (five standing in middle foreground and one flying) and the American Egret (two at lower right) are found here commonly, as in other parts of the State. In the cypress areas on the western border of the Everglades the Swallow-tailed Kite (two shown in flight) breeds in larger numbers than elsewhere in the State.



on May 1, 1903. The colony at Island Pond, near Maytown, contained heavily incubated eggs on April 8, 1923, but the colony on Sebastian River did not begin to lay until April 23 in the same year. Laying continues in any large rookery for a considerable period, new pairs coming in every day and beginning to nest. At the Indian Key rookery in Tampa Bay, Bent reports the first young on April 21, 1925; at the same place, on May 10, 1918, most of the young were about half grown. A colony found by Nicholson 12 miles west of Orlando began nesting about April 20, 1928, and continued until the last of June.

The birds procure their food generally at some distance from the rookery, in marshes, ponds, and bayous, and on the borders of streams. At night, the scattered flocks all return to the common roost, which is usually in or near a heron rookery. The flight of the birds is rapid and well sustained, but with alternate periods of sailing; they move usually in ordered ranks, either in a broad column or in single file, and at times they perform wonderful evolutions in the upper air, the whole flock moving as a unit, circling to a great height, and plunging nearly to the earth with tremendous speed.

Food.—Authors are agreed that the principal food of the White Ibis is crawfish. Baynard (1912a, pp. 167–169) gives the results of the examination of 50 meals of the young of this species as follows: 352 cutworms, 308 grasshoppers, 602 crawfishes, and 42 small moccasins. He reports, also, that more than 2,000 Ibises were seen walking about in a field planted to squashes, turning over the squashes and catching grasshoppers. Wayne (1922, pp. 27–30) says of their food in South Carolina: "Young White Ibises, when able to take care of themselves, do not, as one would suppose, seek the principal food of the adult birds, which is crayfish, but hunt fiddlers in the canals and estuaries of the salt or brackish water marshes. . . ."

SCARLET IBIS: *Guára rúbra* (Linnaeus)

Recognition Marks.—Similar in size to the White Ibis; plumage rich scarlet.

Range.—Resident in tropical South America; of casual occurrence in Central America and the West Indies, and accidental in New Mexico, Louisiana, and Florida.

Distribution in Florida.—An immature bird was collected at Fort Capron, Indian River Inlet, and mounted by Charles Dury in March, 1874; this specimen is in the collection of the Cuvier Club, Cincinnati, Ohio, where it was identified by Dr. H. C. Oberholser. Scott (1889a, p. 15) reports one individual seen in May, 1888, at Fort Ogden, and Brewster (1883, p. 185) records a specimen, labeled "Florida," in the Museum of the College of Charleston, South Carolina.

ROSEATE SPOONBILL: *Ajáia ajája* (Linnaeus)

Other Name: Pink Curlew

Recognition Marks.—Slightly larger than the American Bittern (length, 28 to 31 inches; spread, 48 to 53 inches). Bill 6 to 7 inches long, *flattened like a spatula*, widening toward the tip to 2 inches or more. Head bare, yellowish green; neck, back, and breast white; rest of body and wings pale rose-pink, the shoulders and tail coverts splashed with carmine. (Plate 21.)

Range.—From southern Texas, southern Louisiana, southern Alabama, and southern Georgia south to Argentina and Chile; accidental in California, Utah, Colorado, Kansas, and Wisconsin.

DISTRIBUTION IN FLORIDA.—In the early days, this beautiful bird was abundant over the greater part of southern Florida, as far north as Pelican Island in the Indian River and Tarpon Springs on the Gulf coast, and not uncommon even as far as St. Marks (Pennock, 1919e, p. 114) and St. Augustine (Barton, 1799, p. xvii). Bryant (1859a, p. 17) found the birds breeding abundantly on Pelican Island in the Indian River about 1858, and Ober (1874b, p. 163) noted them breeding on an island in Lake Okeechobee in 1874.

Specimens in the Museum of Comparative Zoölogy were collected on the Kissimmee River, May 14 and 20, 1883, and at Gadsden, November 21, 1883. Scott took a specimen at the mouth of the Withlacoochee River, November 11, 1879. Kline (1887a, p. 413) observed a flock of 15 on the coast of Wakulla County, June 20, 1886.

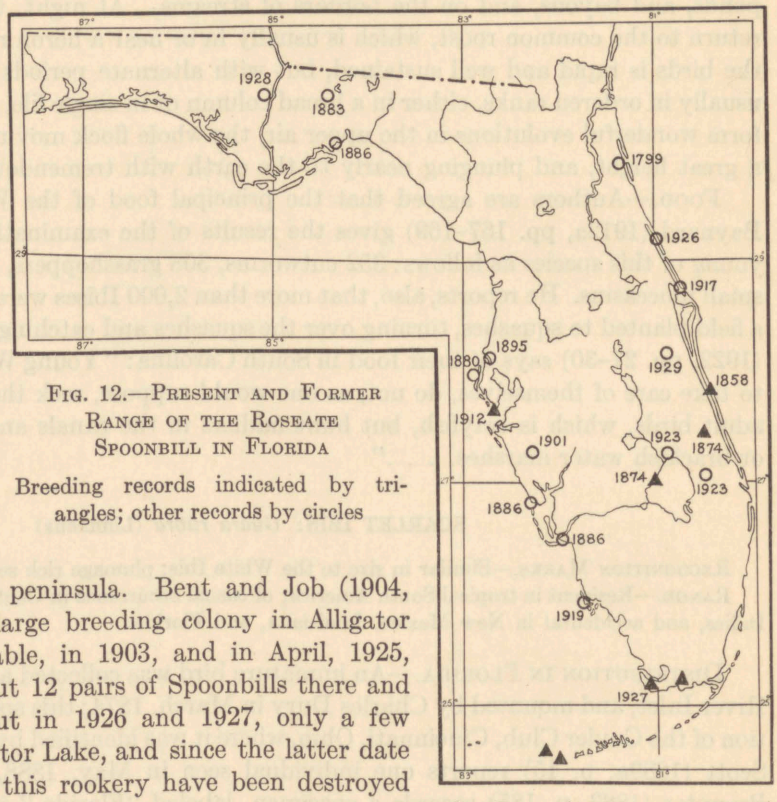


FIG. 12.—PRESENT AND FORMER RANGE OF THE ROSEATE SPOONBILL IN FLORIDA

Breeding records indicated by triangles; other records by circles

Within recent years the numbers of the Roseate Spoonbill have been much depleted and the birds have been restricted in their breeding area mainly to the extreme southern end of the peninsula. Bent and Job (1904, p. 129) reported a large breeding colony in Alligator Lake, near Cape Sable, in 1903, and in April, 1925, E. J. Court saw about 12 pairs of Spoonbills there and at near-by lakes; but in 1926 and 1927, only a few pairs nested in Alligator Lake, and since the latter date most of the trees in this rookery have been destroyed by a hurricane and the birds have gone elsewhere to breed. Bent (1927a, pp. 14–15) describes the large rookery in Cuthbert Lake, which in 1908 was estimated to contain 75 or more breeding Spoonbills. In 1913, T. J. Ashe, warden at the Key West Reservation, noted 75 adults and 37 young on Boca Grande and Marquesas Keys. In 1912, B. J. Pacetti recorded 85 Spoonbills nesting on Indian Key Reservation, Tampa Bay, and in October of the same year Warden Pillsbury reported 80 young raised that season. Since that date, however, the birds have ceased to breed on the reservation, although considerable numbers come there to feed and often remain for weeks at a time. On June 12, 1922, Pacetti counted 143 birds on Bush Key (near Indian Key); on May 30, 1923, Perry Wetmore observed 51 birds, and on June 10, 40 birds, in the same vicinity;

and Warden Bennett reported 75 to 100 birds there on August 3, 1924, and 20 birds on July 1, 1927. I saw a flock of about 30 there May 10, 1918, and F. L. Jaques noted one of 40 or 50 on the reservation, May 2, 1930.

In April, 1919, J. E. Crawford, of Naples, reported a colony of Spoonbills living on Pavilion Key, south of Chokoloskee, and several residents of the west coast have mentioned a rookery some 3 miles east of Caxambas, but E. J. Court, who visited these localities in the spring of 1925, failed to locate any breeding colonies. Several recent reports from local hunters indicate that a colony breeds near the mouth of Wolf Creek, Osceola County, and another near Oak Hill, on Mosquito Lagoon, but these have not been verified. D. J. Nicholson (1929f, p. 381), on the authority of Henry Redding, records a nesting colony in Palm Beach County. A local hunter reported seeing 12 of these birds on the Kissimmee River below Lake Kissimmee in 1916. He said also, that about 80 Spoonbills were seen on Mosquito Lagoon during the summer of 1917. W. R. Collins saw a flock of 17 about 6 miles north of Okeechobee City, on July 16, 1923, and another (or the same) flock within 6 miles of Indian Town, on August 2. F. F. Gander observed 3 birds flying directly over his head, near Blountstown, June 27, 1928. John B. Semple saw 41 Spoonbills on March 12, 1931, feeding in a swamp near Cape Sable. In August, 1931, Captain W. A. Roberts, United States Deputy Game Warden, reported Spoonbills to the number of more than 1,000, in flocks of 25 to 200, on the southwest coast of Florida, in the vicinity of Alligator Cove and Duck Rock, Monroe County. Occurrence of the birds in such numbers indicates a very gratifying increase within recent years.

HAUNTS AND HABITS.—The Roseate Spoonbill is found mainly in boggy sloughs in the mangrove swamps or in the shallow bays and inlets along the coast. The birds formerly occurred in large flocks, but persecution has greatly reduced their numbers, so that now bunches of more than a dozen birds are rarely seen. They fly with their necks outstretched to the full length and with their legs extended behind; occasionally they ascend in spirals to a great height and circle in the manner of hawks. According to Bent, the only note heard from the Spoonbills on their breeding grounds is "a grunting croak in a low key and so subdued as not to be audible at any great distance." The adult birds are very shy, but I found it possible to approach closely a family of four nearly grown young standing in and near a nest in a mangrove growing in a lake. Their method of feeding is described by Audubon (1838, vol. 4, p. 191) as follows:

> To procure their food, the Spoonbills first generally alight near the water, into which they then wade up to the tibia, and immerse their bills in the water or soft mud, sometimes with the head and even the whole neck beneath the surface. They frequently withdraw these parts, however, and look around to ascertain if danger is near. They move their partially opened mandibles laterally to and fro with a considerable degree of elegance, munching the fry, insects, or small shell-fish, which they secure, before swallowing them. When there are many together, one usually acts as sentinel, unless a Heron should be near; and in either case you may despair of approaching them.

The nests of this species are usually built at a height of 12 or 15 feet above the water in mangrove trees, in a rookery of White Ibises or some of the Herons. Bent (1927a, p. 15) describes the nests found by him in Cuthbert Lake in 1903 as about the size of a Water-Turkey's nest, but more neatly made without the use of dead leaves. They were

deeply hollowed and lined with strips of inner bark and water moss. On a later visit, in 1908, Bent found a number of the nests "grouped together, well inside the rookery, in the densest and most shady portion and placed on the lower branches of the red mangroves with more or less water or soft mud under them. The nest containing the set of four eggs was about 10 feet up on a horizontal branch; it was a large nest of coarse sticks, lined with finer twigs and with the dead and yellow leaves of the red mangrove."

The eggs of the Roseate Spoonbill are usually 3, sometimes 4 or 5, in number, and are similar to those of the White Ibis, but larger. The breeding season, according to Bent, extends from January to June. Eggs were taken on Marquesas Key, January 11, 1883. Bryant (1859a, p. 17) says the birds began laying at Pelican Island by the middle of February. R. D. Hoyt (1906, p. 58) found 12 or more Spoonbills nesting in a lake back of Cape Sable, March 22, 1906; at that date some nests contained 3, 4, or 5 eggs, while others were in process of construction. Bayard Christy observed 3 broods of young, almost ready to fly, at Alligator Lake, February 24, 1927, and John B. Semple took a set of fresh eggs there, March 1, 1926. Pike (1931, p. 423) reports finding 12 nests with young in this rookery in January, 1929; since that date most of the trees have been killed by a hurricane and few birds of any kind are now nesting there. Bent noted both eggs and downy young at Cuthbert Lake, May 1, 1903, and several sets of fresh eggs on March 29, 1908.

Food.—The stomach of an adult Spoonbill collected at Cape Sable contained the remains of 3 or more small fishes, one small crustacean, and 3 tubers of a sedge (*Cyperus*). Two nearly grown young taken at Alligator Lake had been fed on small fishes, shrimps, and water beetles. The stomach of one of these contained 246 killifishes of several species and 152 shrimps (*Palaemonetes exilipes*). The contents of a stomach examined at Sarasota Bay by N. B. Moore consisted of the same kinds of food—small fishes and shrimps.

FLAMINGOES: Family Phoenicopteridae

AMERICAN FLAMINGO: *Phoenicópterus rúber* Linnaeus

Recognition Marks.—Readily recognized by its great size (length, 42 to 48 inches; spread, 64 to 66 inches; bill more than 5 inches), extremely long legs and neck, and uniformly vermilion-scarlet color. (Plate 16.)

Range.—The home of the American Flamingo is on the tropical coasts and islands from the Bahamas, Cuba, Haiti, and Yucatan to Brazil and Guiana, and in the Galapagos Islands. It is accidental in South Carolina, and formerly was a regular visitor to extreme southern Florida and the Keys.

Distribution in Florida.—Audubon, in 1832 (1839, vol. 5, p. 255) found Flamingoes numerous at Indian Key and Key West, and mentioned their occurrence as far north as Pensacola, but he gave no evidence of their nesting. In a letter to the Smithsonian Institution, Würdemann (1861, pp. 426–430) gave a graphic account of the capture of about 100 Flamingoes in the shallow waters about Indian Key on August 6, 1857. A flock estimated to contain 500 birds was discovered, which at that season were moulting their flight feathers and thus were unable to fly. Maynard (1881, p. 436), visiting the Florida Keys in 1871, did not observe any Flamingoes, but his assistants on a later trip (1874)

once saw a flock of seven come in from across the Gulf Stream, and alight on a mud flat; by placing a tame White Pelican in the front of their skiff, the men were able to approach near enough to kill six of the birds. Maynard was informed by residents of the Keys that Flamingoes appeared there only during the summer, after they had reared their young in the Bahamas.

Scott (1890c, pp. 221–226), in February, 1890, noted a flock of about 1,000 of these birds in the shallow bays 18 miles east of Cape Sable, and in March, 1902, Reginald Heber Howe, Jr. (Howe and King, 1902, p. 27) observed a flock of about the same size in the same region. All these writers suggest the probability that the birds bred along the southern coast of the peninsula, but none was able to find any definite signs of a nesting colony. It is most likely, therefore, that the birds that visit Florida come there only to feed. It scarcely seems possible that, if the birds have nested in Florida waters, the peculiar mud nests should not have been discovered by some of the numerous explorers who have penetrated the bays on the southern coast.

In January, 1910, a flock of 60 Flamingoes was reported at Cotton Key by a native hunter, and in August, 1916, H. L. Ferguson saw four birds at Central Supply, on Upper Matecumbe Key. Holt (1924, p. 598) records three seen in December, 1923, near Flamingo. Two birds were observed in March, 1930, by Charles G. Wood, near the Tamiami Trail in Dade County.

A flock of 14 Flamingoes was observed by S. F. Sirman, curator of the Opa-Locka Zoölogical Garden, about the first of February, 1931, along the road leading to Key Largo. Mr. Sirman writes of the occurrence as follows:

> It was about four o'clock in the afternoon. There were fourteen of the birds, and they were wading around in the water by the side of the road. This was about a quarter of a mile north of the Card Sound Bridge and near the Dade County line. The Flamingoes were so tame and I was so surprised to see them there that I stopped the car and walked back to get a closer view. Two seemed wilder than the other twelve and would not let us approach so closely, but twelve of them let us get within 20 feet. I went back to the car and got some bread from my lunch box and threw it to them. They took it in their bills, squirted water through it in a little while, then ate it. They seemed to be very tired and hungry and I have always supposed that they were blown here by the storm, as they soon after disappeared.

On February 19, 1931, following a heavy windstorm the night previous, G. W. Romer, of Miami, was in the Everglades southwest of that city, prepared to photograph any birds of interest. While he was waiting concealed in a blind, a flock of 16 Flamingoes appeared, wading and feeding in the shallow water of the canal near which the blind was placed. As a result of this rare good fortune, Mr. Romer obtained the remarkable photograph reproduced on Plate 16. At the click of the shutter the birds made a hurried and noisy exit from the scene. Probably this was the same flock seen by Mr. Sirman near Card Sound earlier in the same month. The appearance of these rare birds in such numbers in Florida is at this date quite unusual but leads us to hope that with adequate protection they may regularly visit southern Florida, as they did in former times.

Scott (1889a, p. 14) reported the Flamingo as a rare summer visitor on the Gulf coast as far north as Tampa Bay; four were seen there, in 1885, this being his last record. Capt. George Warner, however, says that a flock of 9 birds visited the bay in the vicinity of Egmont Key some time between 1911 and 1916. Four young birds were captured

alive at Warrington in 1881 (D.D. Stone, 1885, p. 158). H. L. Stoddard (1928a, p. 201) observed a single bird at Shell Point, Wakulla County, September 24 and 25, 1927, wading about in a shallow, salt pond. This bird is known to have remained in that locality for several weeks, and was last seen on January 31, 1928, at Wakulla Beach.

Stragglers are occasionally seen on the east coast. One was killed in 1875 in Mosquito Lagoon near Turtle Mound (Butler, 1924, p. 150); and one killed on Lake Worth in May, 1905, is recorded by Ryman (1908, p. 313). R. G. Darrow reports two seen in July, 1913, on an island 3 miles east of Fort Pierce. In 1876 or 1877 a specimen was taken in Volusia County; this bird was mounted by Charles Dury and was presented by John S. Baker to the Cuvier Club of Cincinnati, Ohio.

HAUNTS AND HABITS.—These strikingly handsome and curious birds are strongly gregarious; for a breeding ground they select a flooded mud or marl flat on some secluded islet, and they feed also in similar situations. The nests, built in dense colonies, are composed of mud scooped up by the birds from the immediate vicinity of the nest, sometimes with the addition of leaves, roots, or twigs. Their shape is that of a truncated cone, hollowed on top, 5 to 13 inches in height. Generally only one egg is laid, the incubating bird sitting on the nest in the usual manner with its legs folded under its body.

The adult birds feed exclusively on small mollusks of the genus *Cerithium*, which are strained out of the mud flats with their peculiar bill and swallowed whole. In their efforts to loosen the shells from the bottom, the birds employ a treading or dancing motion while their heads are submerged. Chapman, from whose extended account (1905b, pp. 53–77) these data are taken, describes the note of the adult birds as a loud, goose-like *huh-huh-huh*, the second syllable being strongly accented. "Other calls were a deep nasal, resonant *honk, honk, honk, honk*, even more goose-like in tone than the first call mentioned, a hen-like, drawled *cah-cah-cah-cah*, and a broken *cut-leek*."

FOOD.—As already mentioned, the food of the Flamingo consists wholly of small mollusks that are of no value to man. This splendid bird should be rigidly protected in the hope that it may increase and again visit Florida waters in numbers, as in the past.

DUCKS, GEESE, AND SWANS: FAMILY ANATIDAE

WHISTLING SWAN: *Cygnus columbianus* (Ord)

RECOGNITION MARKS.—Easily distinguished by its large size (length, 48 to 55 inches; spread, 72 to 88 inches), white color, and extremely long neck.

RANGE.—Breeds on the Arctic coasts and islands of North America south to the Barren Grounds of northern Canada and the Alaska Peninsula. Winters mainly on the Atlantic coast from Maryland to North Carolina (rarely north to Massachusetts), and south to Florida and the coasts of Louisiana and Texas; also on the Pacific coast from southern Alaska to northern Lower California.

DISTRIBUTION IN FLORIDA.—Cory (1896b, p. 241) records a specimen brought into Jacksonville in the winter of 1894–95. A writer in Forest and Stream (1886, p. 147) mentions this species as being seen several times in St. Andrews Bay, March 2, 1886. C. J. Pennock reports the occurrence of a Swan at St. Marks about the year 1904; the bird lived in the vicinity for several weeks. Earle R. Greene observed a Swan in a marsh between Pablo and Atlantic Beach, December 14, 1924. F. M. Weston reports the cap-

PLATE 22

EXPLANATION OF PLATE 22

WHITE IBISES CIRCLING OVER THE EVERGLADES

During winter and spring adult White Ibises may frequently be seen in flocks circling high in air, in perfect unison, the alternate flash of light and shadow on their backs and underparts visible at great distances.

ture of a specimen by local hunters in the northern part of Escambia County, between January 24 and February 15, 1926, and the accidental killing by an airplane of one out of a flock of 8 in Pensacola Bay, December 1, 1926. J. B. Royall states that single birds were seen at Carabelle and St. Marks, November 20, 1926.

HAUNTS AND HABITS.—Swans feed in shallow water by reaching with their long necks to the bottom, sometimes tipping up with the tail in the air to assist in making a long reach. In their search for the roots of aquatic plants they often tread out large holes in the marsh and root up many plants. In this way they may destroy valuable duck foods and so make themselves undesirable visitors on wild-fowl preserves or hunting grounds. In rising from the water, these heavy-bodied birds must use their feet to assist them in gaining headway; once fully launched in the air, they fly with slow, powerful wing beats, often at a great height, and attain a speed probably greater than any of the ducks. On long migratory flights they travel in V-shaped flocks, like the wild geese, but on shorter flights they may fly in curving lines or irregular bunches. "The notes of the whistling swan are varied, loud and striking at times and again soft and musical trumpetings. To me [says Bent] they are suggestive of the Canada goose's call in form, but are more like soft musical laughter, suggested by the syllables '*wow-how-ou*,' heavily accented on the second note." (Bent, 1925, p. 288.)

Swans are not considered of much value as game birds, but they are now protected because of their aesthetic value. Their principal food is said to be the roots and tubers of wild celery and pondweeds, various grasses, snails, and insects.

CANADA GOOSE: *Brânta canadénsis canadénsis* (Linnaeus)

OTHER NAMES: **Wild Goose; Honker; Gray Goose**

RECOGNITION MARKS.—The largest of the North American geese (length, 34 to 43 inches; spread, 59 to 65 inches). *Adult:* Head and neck black, throat white, this color extending up to a point on sides of head behind the eye; fore back and wings hair brown, the ends of the primaries becoming darker; rump and tail fuscous-black; underparts varying from light drab to white.

RANGE.—Breeds in Canada, from the northern limit of trees in Mackenzie and northern Quebec south to the Gulf of St. Lawrence, James Bay, South Dakota, northern Utah, northern Nevada, and northern California. Winters over nearly all the United States, from Nova Scotia, southern New England, southern Wisconsin, South Dakota, Wyoming, and southern British Columbia south to southern California, northern Mexico, and the Gulf coasts from Texas to Florida.

DISTRIBUTION IN FLORIDA.—Winters chiefly on the northwestern coast, from Apalachicola Bay to Deadman's Bay; south of that it is of rare and irregular occurrence. R. G. Porter reports it in numbers every season in Apalachicola Bay, and plentiful in the winter of 1919–20 at the mouth of Econfena River and at Piney Point. We found the birds numerous near the mouth of Goose Creek, Wakulla County, in January, 1920, and Stoddard noted not less than 3,000 in the same region in December, 1928. Pennock says they are of regular and abundant occurrence at St. Marks, arriving from the North on October 9, 1917; October 15, 1916 and 1918; and October 17, 1913, 1915, and 1919. The latest dates on which they were observed there in spring were March 19, 1914 and 1915, and March 21, 1917. A flock was seen at Tallahassee, October 15, 1896, but the species is considered rare in Leon County.

Maynard (1881, p. 439) reported the species very common in winter at Cedar Keys.

Ferguson states that it was common about 1912 at Chassahowitzka River, but has been scarce in recent years; three were seen there on November 2, 1919. Cory (1896b, p. 239) speaks of the occasional occurrence of Canada Geese on the Indian River, but apparently they are very rare on the east coast and in the interior. Pierson (1921, p. 599) records a flock seen at Eureka, May 22, 1921. D. J. Nicholson reports two large flocks flying over Orlando at night, October 1, 1909, and E. Stewart Hyer mentions a flock of 31 in the same region on March 8, 1910. S. R. Ingersoll saw a flock of 25 flying south over the Halifax River, November 5, 1917; and on November 26, 1923, one was shot there by a hunter. R. G. Darrow noted a flock of 27 seen on Lake Okeechobee, December 30, 1913.

HAUNTS AND HABITS.—Canada Geese, during the winter season, frequent the bays along the northwestern coast of Florida, occurring mostly in large flocks. They are persistently hunted during the open season and are therefore exceedingly wary and difficult to approach. Describing their habits in this region, C. J. Pennock (Bent, 1925, p. 221) says:

> The numerous shallow bays, bayous, and broad river mouths of the counties of Wakulla, Jefferson, and Taylor, lying south and southeast from Tallahassee, offer attractive feeding for winter visiting *Branta canadensis canadensis*, while not infrequently a short distance inland, just back of the bordering salt marshes, numerous sand flats and burnt-over semimarsh areas afford irresistible attractions to a hungry goose. Fresh shoots of grass with plenty of gravel and a clear, clean sand bed in which to take a siesta seems to be a combination most alluring, and in February and early March, with weather conditions favorable, numerous bands of these sturdy birds may be found constantly on the move, flying in as the tide rises and stops their feeding along shore, or if undisturbed after a hearty feeding on the freshly grown grass, they betake them to a long stretch of bare sand, where they evidently feel secure from surprise by virtue of sentinels most alert with keenest senses of sight and hearing, some hunters even claiming them to have a like keen sense of smell; at any rate they are most difficult to approach at such times and usually beat off up wind just before an approaching hunter gets within range.

During migration, Canada Geese fly usually at a great height in regular V-shaped formation, with slow, steady wing beats but at a good rate of speed, uttering frequently their resonant honking notes. They are said to be quite regular in their times of feeding, preferring to visit their chosen feeding grounds in the early morning and in the evening before sunset. In Apalachee Bay, near the mouth of Goose Creek, in January, 1920, we found them feeding chiefly in the shallow parts of the bay around a small island about a mile off shore, but making occasional visits to the mainland, where probably they gleaned in the corn fields. This species is one of the most important and highly prized of our game birds. Although occasionally destructive during its spring migration to sprouting grain, it apparently does no damage to crops in Florida.

FOOD.—Bent (1925, p. 213) says of their food habits:

> In the marshes they feed on wild rice, arrowhead, sedges, marsh grasses, and various aquatic plants, eating the roots as well as the leaves and shoots. On the fall migration they again frequent the grain fields to pick up the fallen grain, pull up the stubble, and nibble at what green herbage they can find. They resort to the shallow ponds and borders of lakes to feed after the manner of the surface-feeding ducks, reaching down to the bottom with their long necks and even tipping up with their feet in the air, in their attempt to reach the succulent roots and the tender water plants. On the coast in winter they prefer to feed in fresh or brackish water on the leaves, blades, and fruits of marine plants, such as *Zostera marina*, the sea lettuce (*Ulva lactuca*) and various *Algae*. Probably some small mollusks, crustaceans, and other small marine animals are taken at the same time.

HUTCHINS'S GOOSE: *Brânta canadênsis hútchinsi* (Richardson)

OTHER NAMES: Little Goose; Short-necked Goose

RECOGNITION MARKS.—Smaller than the Canada Goose (length, about 23 to 34 inches; spread, 45 to 54 inches); usually not distinguishable from it in life.

RANGE.—Hutchins's Goose, a small race of the Canada Goose, breeds in the Arctic regions of North America south to the west coast of Hudson Bay. It winters chiefly in western United States, east regularly to the Mississippi Valley, but only casually on the Atlantic coast.

DISTRIBUTION IN FLORIDA.—There is but one record from Florida, that of a specimen picked up dead at St. Marks, March 12, 1918, and recorded by Pennock (1919e, p. 114).

AMERICAN BRANT: *Brânta bérnicla hróta* (Müller)

OTHER NAMES: White-bellied Brant; Sea Brant; Black Brant

RECOGNITION MARKS.—The smallest of the Florida geese, slightly larger than a Mallard (length, 23 to 30 inches; spread, 42 to 52 inches; bill, 1.25 to 1.40 inches). *Adult:* Head, neck, and fore breast black, with narrow white streaks on sides of the neck; rest of back and wings fuscous to fuscous-black; tail fuscous, with white upper and lower coverts; underparts smoke gray, shading to white on vent.

RANGE.—Breeds in the Arctic regions of eastern North America, Europe, and western Asia. Winters on the Atlantic coast of the United States from Massachusetts to North Carolina, and occasionally to Florida.

DISTRIBUTION IN FLORIDA.—Cory (1896b, p. 240) mentions its occurrence in the State but gives no definite locality. In a letter dated February 3, 1921, Mr. Cory stated that a specimen was reported to have been killed at Pilot Town, at the mouth of the St. Johns River, about 1890, and identified by a member of the Canaveral Club. A definite record is furnished by a specimen in the possession of M. T. Irwin, of Military Park (Eau Gallie), taken on the Banana River, December 25, 1909. Another specimen, owned by H. L. Ferguson, of Sarasota, was taken at the mouth of the Aucilla River (date not recorded) from a flock of about 30 birds of the same species. Captain G. W. Storter informs me that two Brant were killed in a pond on the prairie near Everglade, Collier County, about the year 1900; these were identified by a northern sportsman who knew the bird well. Mr. Waggaman, another northern man staying at Everglade, said that a pair was killed near there in December, 1917.

HAUNTS AND HABITS.—The habits of the Brant during the winter season are described by Bent (1925, p. 243) as follows:

> Brant do not ordinarily fly in V-shaped flocks, like Canada geese, but in long undulating lines, spread out laterally in straight company-front formation, or in a curving line, or in an irregular bunch, and without a definite leader. When migrating overland they fly high, but when traveling along the coast they usually fly within a few feet of the water. Their flight is apparently slow and heavy, but it is really swifter than it seems.

LESSER SNOW GOOSE: *Chén hyperbórea hyperbórea* (Pallas)

OTHER NAMES: White Brant; White Goose; Wavey

RECOGNITION MARKS.—About the size of the Canada Goose (length, 29.5 to 32.5 inches; spread, 53 to 63 inches). Adults with body plumage entirely white, often stained with rusty about head; primaries fuscous-black.

RANGE.—Breeds along the Arctic coast from northern Alaska to Hudson Bay and Baffin Land; the winter range includes most of the United States, from southern British Columbia, Nevada, Utah, southern Colorado, and southern Illinois south to the Gulf coasts and to central Mexico. This race is rare or casual on the Atlantic coast, more numerous in California, Mexico, Texas, and Louisiana.

DISTRIBUTION IN FLORIDA.—Occurs irregularly in small numbers, most of the records being from the Gulf coast. The only Florida specimen available is a skull in the collection of the United States National Museum taken on the Tortugas, in the spring of 1860, and this is referable to *hyperborea*. Scott (1888b, p. 183) records one specimen shot from a bunch of four near Punta Rassa. Richard Williams informs me that a flock of 10 birds was seen at Useppa Island, March 29, 1919. C. J. Pennock reports a flock of 7 seen near the mouth of the Aucilla River, October 30, 1916, and a specimen shot from a bunch of 4 at St. Marks, November 23, 1918; J. W. Gresham saw two Snow Geese at the latter place, November 12, 1925, flying high in a flock of Canada Geese. A local hunter reported 600 birds seen on the coast of Taylor County, November 12, 1927. F. M. Weston states that a flock of 15 spent several weeks in the winter of 1916–17 on the Big Lagoon near the entrance to Pensacola Bay; several of them were shot by sportsmen. On October 23, 1925, he says numbers of Snow Geese were observed flying westward in flocks of Canada Geese. M. S. Crosby records 25 birds seen at St. Augustine, February 6, 1924, and W. R. Collins reports one killed at Miami Locks in December, 1929. E. H. Eaton and James Savage observed a bird at close range at Titusville, February 22, 1930. Its small size indicated that it was the Lesser Snow Goose.

HAUNTS AND HABITS.—Snow Geese in the winter resort in large flocks to marshes, meadows, or grain fields, where they crop the sprouting grass or grain and pull up such plants as have succulent bulbous roots. In migrating, they fly very high, in long curved lines, and are said sometimes to perform remarkable evolutions on the wing. Apparently they are less noisy than the Canada Geese. Vernon Bailey describes their notes as "shrill falsetto cries," while Elliot speaks of a "note like a softened *honk*." Concerning the birds' habits Grinnell (1901, p. 49) writes:

> The spectacle of a flock of these white geese flying is a very beautiful one. Sometimes they perform remarkable evolutions on the wing, and if seen at a distance look like so many snowflakes being whirled hither and thither by the wind. Scarcely less beautiful is the sight which may often be seen in the Rocky Mountain region during the migration. As one rides along under the warm October sun he may have his attention attracted by sweet, faint, distant sounds, interrupted at first, and then gradually coming nearer and clearer, yet still only a murmur; the rider hears it from above, before, behind, and all around, faintly sweet and musically discordant, always softened by distance, like the sound of far-off harps, of sweet bells jangled, of the distant baying of mellow-voiced hounds. Looking up into the sky above him he sees the serene blue far on high flecked with tiny white moving shapes, which seem like snowflakes drifting lazily across the azure sky; and down to earth, falling, falling, falling, come the musical cries of the little wavies that are journeying toward the southland.

These Geese feed almost wholly upon grass and grain and often do considerable damage to pastures and grain fields. They are not greatly esteemed as a table bird and are not much sought by hunters. In certain parts of the far North, however, they formerly were taken in large numbers at some of the trading posts, especially in autumn, when they were easily frozen for winter use.

BLUE GOOSE: *Chén caerulescens* (Linnaeus)

OTHER NAMES: Blue-winged Goose; Blue Brant; Whitehead

RECOGNITION MARKS.—Smaller than the Canada Goose (length, 25 to 30 inches; spread, 53 to 56 inches). *Adult:* Head and neck white, often stained with rusty; fore back and portion of wing coverts fuscous, shaded with neutral gray; hinder back, rump, and tail white or silvery gray; underparts drab, mixed with neutral gray, the belly more or less white; fore part of wings pale smoke gray; primaries mostly fuscous-black. *Immature:* Head and body mostly neutral gray, with buff edgings; hinder back, rump, and tail silvery gray.

RANGE.—The breeding range, as ascertained by recent explorations, is in the interior of southern Baffin Land and on the southwestern coast of Southampton Island, northern Hudson Bay. The winter range is in a very restricted area on the coast of Louisiana, from the mouth of the Mississippi to Vermilion Bay; stragglers are recorded, however, from the Bahamas, Cuba, California, the coast of Texas south to Brownsville, and the coasts of Florida, mainly on the Gulf.

DISTRIBUTION IN FLORIDA.—A specimen in the United States National Museum collection was taken on the Tortugas, April 5, 1859, by Captain D. P. Woodbury. R. G. Porter killed two birds in the fall of 1917 near the mouth of the Aucilla River, and saw a flock of 12 at Indian Pass about November 20, 1917. One was taken on St. Vincent Island, November 1, 1910 (McAtee, 1911a, p. 273), and one shot from a bunch of three at Pensacola, October 28, 1917. J. Y. Gresham reports five seen on a sand flat at St. Marks, November 15, 1925. An immature bird was killed by George Lewis at Goose Creek, Wakulla County, November 25, 1926, and identified by R. W. Williams. Weston (1930a, p. 58) noted a single individual grazing on the athletic field of the Naval Air Station at Pensacola, November 25, 1929. The only record from the east coast is furnished by R. J. Longstreet (1925b, p. 264), who observed a single bird on the flooded golf links at Seabreeze (Daytona Beach), November 13 and 14, 1924.

HAUNTS AND HABITS.—During their winter sojourn in the South the Blue Geese congregate in immense flocks in a restricted area on the coast marshes of Louisiana. McAtee (1910, p. 338) describes their habits there as follows:

> In the Mississippi delta the Blue Geese rest by day on mud flats bordering the Gulf. At the time of my visit (January 29 to February 4, 1910) these were entirely destitute of vegetation, a condition to which the geese had reduced them by their voracious feeding. Every summer these flats are covered by a dense growth of "cut grass" (the local name for *Zizaniopsis miliacea*), "goose grass" (*Scirpus robustus*), "oyster grass" (*Spartina glabra*), "Johnson grass" (*Panicum repens*), and cat-tails or "flag-grass" (*Typha angustifolia*), and every fall are denuded by the Blue Geese or Brant as they are called in the delta. The birds feed principally upon the roots of these plants but the tops of all are eaten at times, if not regularly. Each goose works out a rounded hole in the mud, devouring all of the roots discovered, and these holes are enlarged until they almost touch before the birds move on. They maintain themselves in irregular rows while feeding, much after the manner of certain caterpillars on leaves, and make almost as clean a sweep of the area passed over.

F. S. Hersey (Bent, 1925, p. 182) adds the following notes:

> In reviewing my experience with the blue geese it seems that *normally* they begin to feed about 2 p.m. and continue to do so until dark. They then fly to their roosting ground, where they spend the night. Some time before daylight the flocks again begin to feed, and do so until about 9 or 10 o'clock. They then rest until the afternoon, usually without leaving the feeding ground.
>
> While feeding, small parties are continually flying into the air and moving to a new spot on the outskirts of the flock. If they see anyone approaching at such times, they at once warn their companions and the whole flock takes wing with great clamor.

These Geese, where they occur in large flocks, as they do in Louisiana, cause serious loss by the destruction of the vegetation on large tracts of marshland used for pasturing cattle.

COMMON MALLARD: *Ánas platyrhýnchos platyrhýnchos* Linnaeus

OTHER NAMES: **Greenhead; Gray Mallard; English Duck**

RECOGNITION MARKS.—Length, 22 to 24 inches; spread, 32 to 36 inches. Male with green head and neck and a narrow white ring below. Female much lighter colored than a Black Duck, the bluish violet speculum (wing patch) *bordered before* and *behind by a white bar.*

RANGE.—Widely distributed in the Northern Hemisphere, breeding in North America from the Arctic coast of Alaska and Mackenzie south to Virginia, Ohio, Illinois, Kansas, southern Texas, New Mexico, and Lower California. In winter, the great bulk of the species is found within the United States, chiefly in the Southern and Middle States as far north as open water is found, but it occurs also north to the Aleutian Islands and central Alaska, and south to southern Mexico, Lesser Antilles, and Panama.

DISTRIBUTION IN FLORIDA.—Abundant in winter in the northern parts of the State and rather uncommon in the southern part. Migrants from the North arrived on St. Vincent Island, October 3, 1910; at Tallahassee, October 5, 1896; at Chassahowitzka River, October 7, 1919; at St. Marks, October 22, 1916; at Ponce Park, October 25, 1912; and at Cape Canaveral, November 4, 1889. The species is reported abundant on the Kissimmee River from October 15 to April 1, and at Titusville throughout the winter. B. J. Pacetti reported more than 400 birds on the Mosquito Inlet Reservation in the winter of 1916–17. Mallards are said to be common on St. Vincent Island and moderately common near Pensacola. They occur commonly in autumn in the Apopka saw-grass region, and a few birds visit the Royal Palm Hammock nearly every spring and fall. Specimens have been taken at Miakka, and there is a skin in the United States National Museum that was collected on the Tortugas, October 10, 1859.

HAUNTS AND HABITS.—Mallards are essentially fresh-water ducks, and are most often found in the ponds, sloughs, and swamps of the interior. Here they feed by "puddling" in shallow water, or by picking up acorns or other food from the edge of the water in overflowed bottomlands or along the borders of creeks. They occur chiefly in small bunches, and when feeding in secluded situations, the birds, especially the females, do a good deal of quacking. They are very keen, however, to sense the approach of danger, and quick to make their escape, springing straight up into the air and flying off at a good speed. They will come to a small bunch of decoys properly placed, and they are often hunted also by stealth in the timber and along streams. The Mallard is probably the most important of the American game ducks, highly esteemed for its flesh and for the sport it furnishes.

FOOD.—The examination of 1,578 stomachs of this species by W. L. McAtee (1918, pp. 2–10) yielded the following results: Nine-tenths of the total content was vegetable matter, of which sedges (including saw grass and bulrushes) composed 21.6 per cent, the birds eating the stems, leaves, rootstocks, and tubers, as well as the seeds; wild grasses, including wild rice, wild millet, crab grass, switch grass, and salt-marsh grass, formed 13 per cent of the total food; other vegetable matter consisted of the seeds of smartweed, pondweed, widgeon grass, eelgrass, duck weed, and coontail, the rootstocks and buds of wild celery, and the tubers, stems, and seeds of wapato (*Sagittaria*). Seeds and nuts of

various trees and shrubs found in the stomach contents included acorns, hickory nuts, and the fruits of the cypress, tupelo gum, water elm, hackberry, buttonbush, holly, red haw, dogwood, bayberry, swamp privet, and poison ivy. The animal food, amounting to about 10 per cent of the total, consisted of mollusks, crustaceans, fishes, and insects. R. V. Pierce (1908, p. 855) tells of capturing a Mallard drake on St. Vincent Island with its gullet so distended with acorns that it could not fly.

RED-LEGGED BLACK DUCK: *Anas rubripes rubripes* Brewster

OTHER NAMES: **Black Mallard; Dusky Duck; Black English Duck**

RECOGNITION MARKS.—Sexes alike; similar to the female Mallard but much darker, and speculum bordered only behind with a *narrow* white line. Although called "Black Duck," this bird's plumage is in reality fuscous, mottled with yellowish brown; the throat buff, *heavily streaked with fuscous.* The grayish white lining of the wings shows in flight. (Plate 23.)

RANGE.—Breeds in northern Manitoba and northern Ontario. Winters chiefly in eastern United States from the Great Lakes and New England south to Florida, Louisiana, and Texas.

DISTRIBUTION IN FLORIDA.—An abundant winter resident in northern Florida, but rather scarce in the central and southern parts of the State. Migrants appeared in the Chassahowitzka River, October 1, 1919; at Fernandina, October 15, 1906; Ponce Park, October 25, 1912; Pensacola, November 4, 1923; and at Daytona Beach, November 8, 1924. Specimens were taken on the Aucilla River, April 1, 1905; and on Grassy Island, Taylor County, April 4, 1905. Of the large number of Black Ducks banded at Lake Scugog, Ontario, from 1923 to 1926, 16 have been taken in winter at the following places in Florida: Pensacola, Milton, Havana, Lynn Haven, Arran (Taylor County), Ocklocknee River, Fernandina, Morriston, Bradenton, Charlotte County, Brevard County, Titusville, Hypoluxo, and Newfound Harbor (Lincoln, 1924, pp. 17–23; 1927, p. 22).

Ludwig Bethel, Warden of the Key West Reservation, reported "black ducks" in small numbers among the Keys in November and December, 1924. In view of the capture of the banded specimens mentioned above, it seems probable those reported were of the present species, rather than Florida Ducks. H. L. Ferguson says that he has shot many Black Ducks in Chassahowitzka Bay and that all but one were of the red-legged variety. Francis Harper saw three pairs on Merritt Island, February 19, 1917, and three individuals at Orange Lake, February 16, 1917. Chapman records the species as tolerably common in winter at Gainesville. A pair was seen by the writer in the southern end of Lake Okeechobee, February 23, 1918, and a pair in Lake Hicpochee, March 5, 1918. M. S. Crosby noted about 75 at Matanzas Inlet, February 7, 1924, and Savage and Eaton saw 33 near Elfers, February 6, 1930.

HAUNTS AND HABITS.—The Black Duck is usually known in the South as Black Mallard. In habits it is similar to the Common Mallard, frequenting the coastal marshes and tidal creeks and to a lesser extent the fresh-water marshes of the interior. It is an extremely wary and sagacious bird, and usually difficult to decoy. It feeds to a large extent at night, and when much persecuted spends most of the day on open water—bay, river, or ocean. Along the marshy coast of Apalachee Bay, near the mouth of East Goose Creek, in January, 1920, we found this species abundant, associated in large flocks and spending the greater part of the day on the shallow parts of the bay at some distance

from shore. As always, the birds were shy, and on the approach of a boat the whole body would take flight and move some distance up or down the coast. At the mouth of Chassahowitzka River, February 10, 1920, about 100 birds were noted, feeding in small flocks in the shallow tidal creeks flowing through the salt marshes.

When alarmed, these Ducks spring straight up from the water for 8 or 10 feet, and then fly rapidly off in a straight course, rising usually to a considerable height. In flight the whitish lining of the wings is conspicuous. The birds may be distinguished from the Florida Ducks by their darker color. This species is highly esteemed as a game bird, and the hunter who brings in half a dozen of these wary birds in a day may well feel proud of his accomplishment.

Food.—The Black Duck feeds to a greater extent than the Mallard on salt marshes and consequently takes a larger percentage (about one-fourth) of animal food, consisting mainly of mollusks, crustaceans, insects, and fishes. The common blue mussel (*Mytilus edulis*) furnishes a considerable part of the food, being present in 35 of the 622 stomachs examined by McAtee (1918, pp. 10–14). Snails of various species were frequently taken, 650 having been found in one stomach, and small bivalves (clams) were also present in large numbers. The crustaceans included barnacles, shrimps, crawfishes, crabs, and sand fleas; the insects were largely aquatic beetles and bugs, also dragon flies, crickets, grasshoppers, ants, and the rice water weevil. Fishes and their eggs composed only 1.34 per cent of the total food; these included an eel and some killifishes. Marine worms (*Nereis*) were found in 17 stomachs.

The vegetable food, amounting to more than 75 per cent of the total, consisted largely of submerged plants, such as pondweeds, eelgrass, and wild celery. Salt-marsh grass (*Spartina*) and wild rice (*Zizania*) are extensively eaten, some stomachs containing from 1,000 to 1,200 grains of wild rice. Seeds of sedges and of smartweed form an important item in this bird's food; from 2,000 to 36,000 seeds of smartweed were found in individual stomachs. Other less important items are seeds of water lilies, coontail, and pickerel weed, and the leaves, roots, and tubers of wapato (*Sagittaria*).

FLORIDA DUCK: *Ánas fulvígula fulvígula* Ridgway

Other Names: **Florida Black Duck; Brown Mallard; Dusky Mallard; Striped Mallard; Summer Duck; Summer Mallard**

Recognition Marks.—Slightly smaller than the Black Duck (length, 20 to 22 inches; folded wing, 8.80 to 10.40 inches). *Colors much paler,* owing to the more extensive buffy edgings of feathers; throat light buff, *unstreaked;* speculum dull blue, shading to green, *without white border.* (Plate 23.)

Range.—The Florida Duck is confined to Florida, and apparently does not range farther north or west than Alachua County. Chapman (1888a, p. 268) says it was unknown at that time to local sportsmen at Gainesville. Baynard (1913a, p. 241) states that the species was unknown in Alachua County "until 1906, when it appeared on Payne's Prairie and other similar places and began to nest. Resident now and appears to be increasing in numbers." On June 26, 1913, Pennock saw a bunch of 9 birds flying near his camp at Shell Point, but these were not positively identified as between *Anas rubripes* and the present species. H. L. Ferguson reports that this species occasionally

appears in spring on the salt marshes at the mouth of the Chassahowitzka River, but is not known to nest there. It nests regularly at Orange Lake, Alachua County; 30 pairs were estimated to be breeding there in 1916, and 100 birds were reported in the summer of 1918. From that point southward it occurs more or less commonly on all marshy lakes, sloughs, and rivers, south at least to Key Largo, where a pair was seen April 15, 1927 (D. J. Nicholson). On the Kissimmee River, between Lake Kissimmee and Fort Bassenger, Francis Harper saw about 67 birds on January 31 and February 1, 1917. The species nests at Miakka Lake and around the fresh-water lakes near Cape Sable.

HAUNTS AND HABITS.—The Florida Duck is similar in habits to its relatives, the Black Duck and the Mallard, except that it is more strictly confined to fresh-water marshes. It occurs in moderate numbers in the Everglades, around ponds on the prairies, and on the borders of marshy lakes and rivers. The nests are usually placed on dry ground, often at some distance from water, in old fields or on the prairie. A nest found by N. B. Moore (who resided near Sarasota Bay) is described as being "concealed in a thick mass of dry grass held upright by green palmettoes, about two feet high . . . and so canopied by the standing grass that the eggs were not visible from above. There was a rim of soft down, from the mother's breast, around the eggs, partly covering those in the outer circle" (Baird, Brewer, and Ridgway, 1884, vol. 1, pp. 503–504).

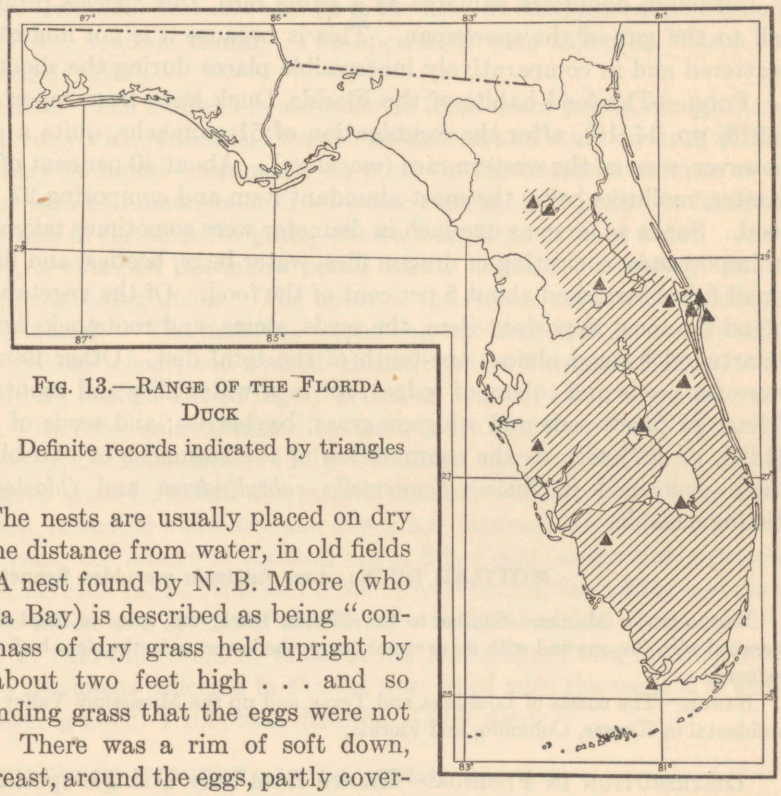


FIG. 13.—RANGE OF THE FLORIDA DUCK
Definite records indicated by triangles

Maynard (1881, p. 442) found this species breeding on Indian River, "the nests being placed on the drier portions of the marshes, in grass which was about 18 inches high." A nest noted on the Banana River, April 8, 1927, by Henry Redding, was placed among palmettoes in a scrub-oak patch, and was composed of dead leaves of oak and palmetto, mixed with down. This nest contained 9 eggs, incubated about a week. A nest with 6 eggs was found near Lake Apopka during the last week in February, 1916; and F. H. Kennard observed a set of 11 fresh eggs near Immokalee, March 20, 1914. Bent and Copeland (1927, p. 375) record two nests seen on Merritt Island, March 29, 1925, "well hidden in tall thick clumps of bulrushes (*Scirpus*)." A. H. Hardisty noted a nest with 9 eggs on that island, May 9, 1928.

The male bird remains with the family after the eggs are hatched, but apparently does not assist in the care of the young. N. B. Moore stated that "in August, September, and the first part of October parties of from 5 to 20 of this species leave the fresh ponds and fly across the bay [Sarasota Bay] to sand bars on the inner sides of the Keys, where they spend the night in the pools or coves near the mangroves and return at sunrise the next morning. Those shot at this time were all males; but in January, February, and March mated birds, flying in pairs, spend their nights in the same places." (Baird, Brewer, and Ridgway, 1884, vol. 1, p. 504.)

Although doubtless valuable as a game bird, this species probably does not often fall to the gun of the sportsman. This is because it is not migratory and is so widely scattered and in comparatively inaccessible places during the shooting season.

Food.—The food habits of the Florida Duck have been reported upon by McAtee (1918, pp. 14–16), after the examination of 51 stomachs, quite a proportion of which, however, were of the western race (*maculosa*). About 40 per cent of the food was animal matter, mollusks being the most abundant item and composing 27 per cent of the total food. Snails as large as one inch in diameter were sometimes taken. Insects were next in importance, consisting of dragon flies, water bugs, beetles, and flies. Crawfishes and small fishes furnished about 5 per cent of the food. Of the vegetable food, grasses composed the most important item, the seeds, stems, and rootstocks being eaten. Seeds of smartweed formed almost one-tenth of the total diet. Other items in lesser quantity were the seeds and tubers of sedges; seeds of water lilies and coontail; seeds, stems, and foliage of pondweeds and widgeon grass; bayberries; and seeds of buttonbush. Baker (1890, p. 267) records the examination of the stomachs of two birds taken at Micco; these contained mollusks, *Truncutella subcylindrica* and *Odostomia impressa* being distinguishable.

MOTTLED DUCK: *Ánas fulvígula maculósa* Sennett

Recognition Marks.—Similar to the Florida Duck, but sides of head and neck more coarsely streaked with fuscous and with more streaking on the lower neck, the clear buff area of the throat much reduced.

Range.—The coasts of Louisiana and Texas, and up the Mississippi Valley in Louisiana; casual or accidental in Kansas, Colorado, and Florida.

Distribution in Florida.—Known from only a single specimen collected by the writer at Little River, February 6, 1918; the bird was an adult male in breeding condition and was accompanied by its mate. It is a typical example of this western race, and its occurrence in southern Florida is quite unexpected.

GADWALL: *Chaulelásmus stréperus* (Linnaeus)

Other Names: Gray Duck; Redwing; Gray Widgeon

Recognition Marks.—Smaller than a Mallard (length, 18 to 22 inches; spread, 34 to 35 inches). Wing of male with *white* speculum, nearly enclosed by black, and a russet patch in front of the black; lower neck and breast grayish brown marked with numerous narrow crescentic bars of white. The female has much less white in the wing, *no russet*, and the black is replaced by brown; it much resembles the female Baldpate, which, however, has a shorter bill and more white in the wing.

RANGE.—The Gadwall is widely distributed in the temperate regions of the Northern Hemisphere. In North America, it breeds from northern Saskatchewan (Athabaska Lake) and Hudson Bay south to southern Wisconsin, central Minnesota, Iowa, Kansas, New Mexico, and southern California. In winter it ranges from southern British Columbia, Colorado, Arkansas, Illinois, and Maryland southward to Mexico, and in Jamaica.

DISTRIBUTION IN FLORIDA.—An abundant winter resident in the northern parts of the State, but thus far unrecorded south of Cape Canaveral. Migrants from the North are reported from Ponce Park, October 25, 1913; Amelia Island, November 2, 1905; and Canaveral, November 5, 1889. The species is said to be of rare occurrence at Gainesville, common at the Chassohowitzka River, uncommon in the Apopka Sawgrass, and abundant at St. Marks and on St. Vincent Island. Two specimens were taken at Wilson, on Merritt Island, March 31, 1923.

HAUNTS AND HABITS.—The Gadwall is a dweller in fresh-water ponds, sloughs, and marshes, associating freely with Mallards, Pintails, Baldpates, and other ducks of similar feeding habits. It may be found occasionally on ponds in the timbered swamps or on the salt marshes, but is most numerous on fresh-water marshes. It is said to forage in the woods for acorns and in the fields for grain, often a long distance from water. Most of its food, however, is obtained in shallow ponds on the marshes, "dabbling" in the usual manner of surface-feeding ducks. The notes of the female are closely similar to those of the female Mallard. "The male has a loud call like *kack kack*, a deep reedlike note resembling the syllable *whack*, and a shrill whistled call" (Wetmore, 1920, p. 241).

FOOD.—The Gadwall, though not so highly prized as some of the other ducks, is a valuable game bird. Its food, as determined by a study by Mabbott (1920, pp. 2–10) in the Biological Survey, consists almost wholly (97.85 per cent) of vegetable matter. Pondweeds and widgeon grass furnished the largest amount—42 per cent of the total food. Seeds of sedges, including bulrushes and saw grass, composed about 20 per cent; algae, about 10 per cent; the foliage of coontail about 8 per cent; and various grasses, about 7 per cent. A favorite food of this and other species during the winter months is the delta potato—the tubers of a species of arrowhead—which furnished about one-fifth of the food found in 27 Gadwall stomachs taken in the Mississippi Delta in November. The stomachs of two specimens collected in Florida were filled with the seeds of a white water lily, one containing about 1,100, and the other 1,200, seeds.

EUROPEAN WIDGEON: *Maréca penélope* (Linnæus)

OTHER NAME: **Red-headed Widgeon**

RECOGNITION MARKS.—About the size of the Baldpate. *Adult male: Head and neck russet;* throat black; crown buffy white; sides of body vermiculated with fuscous; axillars grayish.

RANGE.—This species, of wide distribution in Eurasia, occurs not infrequently in North America in winter and in migration, chiefly on the Atlantic coast from Greenland south to Florida, on the Pacific coast from Alaska to California, and in the Mississippi Valley south to Louisiana. Forbush (1925, p. 203) suggests that the bird probably remains throughout the year in North America and may breed.

DISTRIBUTION IN FLORIDA.—Four specimens of this Widgeon have been recorded as taken in Florida: one, in 1845, by George N. Lawrence (no further data); two taken by N. F. Emmons near Titusville, February 20, 1907 (Fay, 1910, p. 204); and one by V. T. Warley at Titusville, in December, 1918 (H. H. Bailey, 1925a, p. 21).

HAUNTS AND HABITS.—Little seems to be known of this species in America. It is usually found associated with the Baldpate, or American Widgeon, and doubtless is of very similar habits. According to Bent (1923, p. 88), "the two species can be readily distinguished by the reddish head of the adult male and the general ruddy tinge of plumage in the female and young male of the European birds; also the axillars in the baldpate are pure white in both sexes, whereas in the European bird they are freckled or clouded with gray." Hunters who may shoot a bird answering to the above description should save the specimen (or at least the head and wings) and send it to the Biological Survey for identification.

FOOD.—Five stomachs of this species examined (Mabbott, 1920, p. 16) indicated a food preference similar to that of the American Widgeon, or Baldpate. These stomachs contained principally widgeon grass, eelgrass, rootstocks of pondweed, and seeds of a bulrush.

BALDPATE: *Maréca americâna* (Gmelin)

OTHER NAMES: American Widgeon; Green-headed Widgeon; Bald-faced Widgeon; Whistler; Whiteface; Whitebelly

RECOGNITION MARKS.—About the size of the Gadwall; adult male with a white patch on crown and forehead; sides of head, neck, and throat speckled with brownish black; breast and sides light vinaceous drab; fore wing with a large white patch, behind which is a black area enclosing a small metallic green speculum; belly pure white. The female lacks the white crown patch and has the posterior wing patch brown instead of black.

RANGE.—Breeds in the northern parts of North America, from Alaska and Mackenzie south to northern California, Utah, Colorado, Kansas, and northern Indiana. Winters from Chesapeake Bay, the Ohio Valley, Colorado, Utah, Nevada, and Vancouver Island south to Central America and the Lesser Antilles.

DISTRIBUTION IN FLORIDA.—Abundant in winter throughout the greater part of Florida. It was recorded as arriving at the Chassahowitzka River, September 22, 1919 (14 birds); at Cape Canaveral, October 2, 1889; and at Ponce Park, October 25, 1912. Specimens were taken at Fort Myers, January 8, 1892; on Banana Creek, Merritt Island, March 13, 1890; at Fort Bassenger, March 5, 1896; and Kenansville, April 29, 1919. The Baldpate is reported common in winter on St. Vincent Island, Goose Creek (Wakulla County), the Chassahowitzka River, Orange Lake, the Kissimmee River, Merritt Island, at Orlando, and in Whitewater Lakes near Cape Sable. Bayard Christy reported a flock of about 20 on the Tamiami Trail, 50 miles west of Miami, February 20, 1927.

HAUNTS AND HABITS.—The Baldpate feeds mainly in ponds, sloughs, and marshes, associating with Pintails, Gadwalls, Shovellers, and Scaups. It is a surface feeder, procuring its food by "tilting" in shallow water, but in some localities it frequents deeper waters where Canvasbacks, Redheads, or Scaups are engaged in diving, and as these birds bring to the surface roots, bulbs, and foliage of submerged plants, the Baldpate snatches what it can of the coveted food. Forbush (1925, vol. 1, p. 208) shows that this species *can* dive but is not expert, and is not able to dive very deep.

Baldpates fly in small flocks of irregular formation, usually at no great height, often uttering a sweet, mellow whistle as they go. Saunders says: "They also rarely quack like

the mallard and gadwall, but this note is less nasal than the mallard's and not so loud and sonorous as the gadwall's" (Bent, 1923, p. 95). If undisturbed, the birds feed throughout the day, but are most active early in the morning and late in the evening; if much persecuted, they feed largely at night.

FOOD.—The feeding habits of the Baldpate are similar to those of the Gadwall. The Baldpate is mainly vegetarian in its food preferences, 93 per cent of the total food, as determined by Mabbott (1920, p. 11), consisting of vegetable matter. Pondweeds, including widgeon grass and eelgrass, formed the largest portion (42 per cent) of the stomach contents of 229 individuals examined. Other important items were grasses, including wild rice (13.9 per cent); algae (7.7 per cent); sedges (7.4 per cent); wild celery and water weed (5.75 per cent); water milfoils (3.48 per cent); duckweeds (2.2 per cent); and seeds of smartweeds (1.47 per cent). The animal food in the stomachs examined amounted to 6.7 per cent of the total, and consisted chiefly of small mollusks and a few insects. The charge sometimes made that the Widgeon does considerable damage to growing grain was not borne out by the investigation carried on by the Biological Survey.

AMERICAN PINTAIL: *Dâfila acûta tzitzihôa* (Vieillot)

OTHER NAMES: **Sprigtail; Spiketail; Pickettail; Sea Widgeon; Gray Widgeon; Kite-tailed Widgeon**

RECOGNITION MARKS.—About the size of the Florida Duck (length, 26 to 30 inches; tail, 5 to 9 inches; spread, 33 to 36 inches); body and neck long and slender. *Adult male:* Head and throat cinnamon-brown, shading to mummy brown on neck; back and sides vermiculated with grayish white and fuscous; underparts white; wings mouse gray, *without white patch or stripe.* Female resembles the Mallard, but is paler and more grayish throughout, and lacks the purple speculum and white wing bars of that species.

RANGE.—The Pintail has a wide range in North America, breeding from the Arctic coasts of Alaska and Mackenzie south to southern California, northern Utah, Colorado, Nebraska, Iowa, Wisconsin, Michigan, southern Ontario, and New Brunswick, and wintering from southern British Columbia, Colorado, Missouri, southern Illinois, and Maryland south to the Gulf States, the Bahamas, West Indies, and Panama.

DISTRIBUTION IN FLORIDA.—An abundant winter resident in the northern half of the State, and less numerous in the southern part. Migrants from the North were reported at Pensacola, September 14, 1928; St. Marks, September 17, 1918; the Chassahowitzka River, September 22, 1919; Canaveral, September 11, 1889; and St. Lucie Inlet, September 27, 1888. In spring, the species has been recorded at Orlando, March 27, 1910; Goose Creek, March 28, 1919; and at St. Marks early in April. It was reported as not uncommon at Gainesville by Chapman, at Tarpon Springs and Panasoffkee Lake by Scott, and at Cape Sable by H. L. Ferguson. Francis Harper saw about 200 on Merritt Island, February 19, 1917, and a local fisherman reported that several thousand had been seen there a few days before. Bayard Christy noted one or two small flocks in the Everglades, along the Tamiami Trail, February 20 and 21, 1927, and Nicholson saw 20 birds on Okeechobee Lake, February 28, 1928.

HAUNTS AND HABITS.—The Pintail is one of the hardiest of the ducks, and is one of the first to leave its winter home at the approach of spring and push northward. A second flight of transients, however, passes through the United States later in the spring.

The birds frequent marshy ponds, sloughs, and tidal creeks, associating with Widgeons, teals, Shovellers, and other surface-feeding ducks. In migration, however, they usually flock with their own species, flying abreast in lines at a considerable height. At such times their long slender necks and long tails will serve to identify them. They may be lured within reach by the aid of decoys, but are always very suspicious, and at the first sign of danger the whole flock springs instantly into the air and makes off at high speed. The voice of the male Pintail is a mellow whistle. According to Millais (1902, p. 97): "The nuptial call of the drake is identical with that of the teal. . . . The female only occasionally utters a low quack, but she sometimes makes a call something like the growling croak of the female widgeon."

Food.—The Pintail is considered one of the most valuable of the American game birds, and its flesh is held in high esteem. Its food, as studied by Mabbott (1920, pp. 31–36), was found to consist very largely of vegetable matter (87 per cent), of which the seeds of pondweeds and sedges furnished the greater part. The seeds of various wild grasses and smartweeds are eaten less frequently, but often in large quantities, several of the stomachs examined containing from 4,000 to 12,500 seeds. Cultivated rice was found in 52 stomachs (10 of them from Florida), but since these birds were all taken in the months of November, December, and February, the rice was undoubtedly waste grain. Other plant food consumed by the Pintail includes the seeds and tubers of arrowheads (*Sagittaria*), seeds of water lilies, glasswort (*Salicornia*), elder, hawthorn, grapes, mallows, crowfoot, coontail, bur reed, and brambles (*Rubus* spp.)

The animal food in the stomachs examined, amounting to 12.85 per cent, consisted mainly of small mollusks, crabs, crawfishes, shrimps, and many kinds of insects, principally beetles and flies. Baker (1890, p. 267) dissected a large number of specimens at Micco, finding only mollusks in the stomachs.

BAHAMA PINTAIL: *Dâfila bahamênsis bahamênsis* (Linnæus)

Recognition Marks.—Smaller than the American Pintail; throat and sides of head below eye pure white; bill plumbeous, with *a large patch of red* on each side near the base; top of head, neck, and back cinnamon, with fuscous spots; underparts similar but paler; wings fuscous, with *two broad bands of vinaceous cinnamon;* speculum green.

Range.—The Bahama Islands, Haiti, Porto Rico, some of the Lesser Antilles, the Guianas, and northern Brazil; casual in Florida and Cuba.

Distribution in Florida.—Of accidental occurrence, there being but one record of its capture—a bird shot by Gardner Perry, February 26, 1912, near the head of the Banana River. This specimen is now in the collection of the Museum of Comparative Zoölogy, Cambridge, Massachusetts, and has been recorded as coming from Cape Canaveral (W. S. Brooks, 1913, p. 110). The data given above were furnished by O. A. Quarterman, who obtained them from the records of the Canaveral Club.

Haunts and Habits.—Describing the haunts of this duck on one of the Bahama Islands, Dr. Glover Allen (1905, p. 120) says: "Long reaches of shallow water alternate with clayey flats a few inches above the tide level. These flats are thinly covered with a growth of small mangroves, grasses, and a few other halophytes, while here and there are little pools surrounded by taller mangrove bushes."

GREEN-WINGED TEAL: *Néttion carolinénse* (Gmelin)

OTHER NAMES: Greenwing; Mud Teal

RECOGNITION MARKS.—One of the smallest of the ducks (length, 12.5 to 16 inches; spread, 22 to 24 inches). *Adult male* in breeding plumage known by the *green speculum* bordered with black, russet brown head and neck, with a green patch on each side of head behind the eye. *Female* has a brownish head and back, and buffy white throat; best identified by the green speculum.

RANGE.—Occurs in the breeding season throughout the northern parts of North America, from northern Alaska and Mackenzie south to southern Quebec, southern Ontario, western New York, northern Michigan, southern Minnesota, Nebraska, northern New Mexico, and central California. Winters from southern British Columbia, Montana, Nebraska, southern Illinois, and Chesapeake Bay south to the West Indies, British Honduras, and southern Mexico.

DISTRIBUTION IN FLORIDA.—A common winter resident in the northern and central parts, but rare in the southern part. The first migrants from the North appeared at St. Marks on September 1, 1919 (2), and September 26, 1917 (50); at the Chassahowitzka River, October 7, 1919; and at Cape Canaveral, October 19, 1889. In spring, the species has been recorded at St. Marks, April 11, 1915, and at Orlando, April 20, 1910. It is reported to occur commonly in winter in Leon County, on St. Vincent Island, at St. Marks, Gainesville, Orlando, Lake Okeechobee, and on the Indian River. At Tarpon Springs, Panasoffkee Lake, and Cape Sable it is considered uncommon.

HAUNTS AND HABITS.—The Green-winged Teal resorts chiefly to fresh-water ponds and marshes, feeding in shallow water with Mallards, Widgeons, and other "puddle ducks." It travels chiefly in flocks of its own kind, and is considered one of the swiftest and most skillful flyers of any of its tribe. Flying in close ranks, twisting and turning with surprising swiftness and in perfect unison, the birds during migration furnish splendid sport for a skilled marksman. They are not especially shy and are easily decoyed. Although they do not ordinarily dive for their food, they are said to be able to dive easily and swim far under water to escape danger. Their note is described by Saunders (in Bent, 1923, p. 107) as "a high-pitched, short, staccato whistle, and is accompanied by a lower-pitched trilled note, uttered less frequently."

FOOD.—The food of this teal, as studied by Mabbott (1920, pp. 17–22) in the Biological Survey, was found to consist largely of vegetable matter (90 per cent), of which the seeds of sedges furnished the greatest part (38.8 per cent). Pondweeds, including widgeon grass and eelgrass, were next in importance, amounting to 11.5 per cent of the total food, and the seeds of various grasses, including wild rice and wild millet, comprised about the same proportion. Other plants eaten in smaller quantities were smartweeds, musk grass, duckweeds, and water milfoil. The animal food, amounting to 9.3 per cent, consisted mainly of flies (chiefly the larval or pupal stages), beetles, bugs, damsel flies, dragon flies, snails, and small crustaceans.

BLUE-WINGED TEAL: *Querquédula discors* (Linnaeus)

OTHER NAMES: Summer Teal; Bluewing

RECOGNITION MARKS.—Slightly larger than the Green-winged Teal (length, 14.5 to 16 inches; spread, 24 to 31 inches). *Adult male:* Sides of *head and neck mouse gray*, faintly tinged with purple; a *broad white crescent* in front of eye, reaching to the throat; speculum green, but with a large area of *light blue on front*

of wing; underparts pinkish buff, mottled with fuscous (darker than in the Green-winged Teal). The female lacks the green speculum, but has the blue wing patch.

RANGE.—Occurs in the breeding season from central British Columbia and southern Mackenzie (Great Slave Lake) south to northern Nevada, central Utah, northern New Mexico, Missouri, southern Indiana, Ohio, and western New York; also casually in Texas, Louisiana, and Florida. In winter, the bulk of the species migrates to Central and South America (south to Brazil), but some are found at that season in the southern United States, and casually north as far as southern Illinois and Maryland.

DISTRIBUTION IN FLORIDA.—Occurs more or less commonly in winter over practically the entire area suited to its habits. Migrants appeared in fall at Cape Canaveral, August 23, 1889; on St. Vincent Island, August 23, 1919; at St. Marks, September 2, 1914, and September 12, 1916; Pensacola, September 8, 1929; Mosquito Inlet, September 17 to 19, 1915 (large flight); and Tampa Bay, September 5, 1914. The latest dates these birds have been seen in spring are as follows: Whitfield, April 16, 1903; Lake Hicpochee, April 19, 1919; Gainesville, April 29, 1887; Cape Canaveral, April 29, 1889; and Pensacola, May 2, 1926. Specimens were taken at Peninsula Point, Franklin County, May 11, 1926; Sarasota, May 16, 1902; and Crescent Lake, May 24, 1914.

The Blue-winged Teal is reported common in winter on St. Vincent Island, at Tarpon Springs, Kissimmee, Apopka Lake, Orlando, and Cape Sable. At Key West, numerous small flocks were seen in November and December, 1924. J. G. Kilpatrick reports finding a teal's nest containing 8 eggs in the St. Johns marsh, 13 miles west of Titusville about the middle of April. The bird was flushed from the nest.[1] W. O. Trumbo, of Zellwood, says that 12 or 15 pairs were present throughout the summer of 1916 in the Apopka marshes, and that young birds were seen there.

HAUNTS AND HABITS.—Appearing in migration early in the fall, while the weather is still warm, this species has received the name of "summer teal." It is a lover of marshy ponds and sluggish streams, where it feeds in shallow water, mainly on the surface, but occasionally tilting its half-submerged body to procure food from the bottom. The birds are found associated with Shovellers, Pintails, Widgeons, and Mallards, and Bent states that in Florida they feed with the larger shore birds in shallow lagoons. They travel in large, compact flocks and their speed is almost equal to that of the Greenwing. In flight they often utter soft lisping or peeping notes; the females at times give a faint quack. Wetmore describes the [call note] of the male as "a high-pitched *tseef, tseef, tseef*, entirely different from notes of other male teals."

FOOD.—Seventy per cent of the food of the Bluewing, as determined by Mabbott (1920, pp. 22–28), consists of vegetable matter, the most important items being the seeds of sedges; seeds, stems, and leaves of pondweeds; seeds of various wild grasses (including wild rice) and smartweeds. Twelve birds taken in Florida in November had eaten cultivated rice, but this was probably waste grain. The animal portion of the food amounted to nearly 30 per cent of the total and consisted mainly of snails, insects, and crustaceans. The insects most frequently eaten were the larvae of caddis flies, nymphs of dragon flies and damsel flies, and various species of beetles. Baker (1890, p. 267) records the examination of the stomachs of 20 specimens at Micco, in which he found shells of *Amnicola floridana* and *Truncatella subcylindrica.*

[1] But not specifically identified as between the two teals.

CINNAMON TEAL: *Querquédula cyanóptera* (Vieillot)

OTHER NAME: **Red-breasted Teal**

RECOGNITION MARKS.—Slightly larger than the Blue-winged Teal (length, 16 to 17 inches; spread 25 inches). *Adult male:* Most of head and body solid walnut brown. *Female:* Very similar to the Blue-winged, but bill larger; head and breast more buffy; and belly more clouded with fuscous.

RANGE.—Western North America and southern South America, breeding from southern British Columbia and Alberta south to northern Lower California, Chihuahua, and south central Texas; east to eastern Wyoming and southwestern Kansas; also in South America from Peru and Argentina south to the Falkland Islands. In winter, it occurs in North America from central California, southern Arizona, and central New Mexico south to southern Mexico, and in South America from Brazil to Patagonia. It is of accidental occurrence in a number of eastern States, and has been recorded twice from Florida.

DISTRIBUTION IN FLORIDA.—There are but two records from the State—a specimen taken at Lake Iamonia, Leon County, February 18, 1893 (Rhoads, 1893, p. 362; 1907, p. 435), now in the collection of the Academy of Natural Sciences of Philadelphia, and another captured at Lake Jackson, Leon County, November 17, 1906 (R. W. Williams, 1907a, p. 158).

HAUNTS AND HABITS.—The Cinnamon Teal closely resembles the Blue-winged in habits, and is likely to be found in the same haunts.

SHOVELLER: *Spâtula clypeâta* (Linnaeus)

OTHER NAMES: **Spoonbill; Broadbill; Shovelbill; Spoonbill Teal; Mule Duck; Spoon-billed Widgeon**

RECOGNITION MARKS.—Slightly larger than the Wood Duck (length, 17 to 21 inches; spread, 30 to 35 inches); *large spatulate bill*, broadest at the tip. *Adult male:* Head and neck blackish brown, glossed with green; lower neck and fore breast white; belly chestnut-brown; speculum green; fore part of wing light blue, bordered by white on scapulars and wing coverts. The bird in flight thus shows from beneath five alternating areas of dark and white. *Female:* Similar to the Blue-winged Teal, but much larger, and wing patch pale slate-blue.

RANGE.—Widely distributed in the Northern Hemisphere—North America, Europe, and Asia. In America, it breeds from Alaska and northern Mackenzie to southern California, central Arizona, northern New Mexico, Kansas, Iowa, and northern Illinois and Indiana. It winters from southern British Columbia, central California, Arizona, New Mexico, Texas, Missouri, southern Illinois, and the coast of Virginia southward to the West Indies, Colombia, and the Pacific coast of Mexico and Central America.

DISTRIBUTION IN FLORIDA.—Maynard, in 1881 (p. 448), referred to the Shoveller as very abundant on Salt Lake and the Indian River, but observers in recent years have found it only moderately common. Hoxie saw it on the St. Lucie River, September 27, 1888, and Quarterman recorded its arrival at Canaveral on October 2, 1889. In spring, it has been noted at New Smyrna, March 26, 1877; Goose Creek, March 28, 1919; and Orlando, March 30, 1909. It has been reported in winter on St. Vincent Island (common, October 29 to November 9, 1910); in Leon County (rare); at Gainesville (rare); the Chassahowitzka River (numerous); Lake Jessup; the Kissimmee River; Fort Myers; Chester Shoals (abundant, January 7, 1928); Micco; Alligator Lake, near Cape Sable; and Key West. About 4,000 Shovellers were reported by John B. Semple near Flamingo in March, 1931.

HAUNTS AND HABITS.—The Shoveller resembles the teals in habits, frequenting grassy ponds, sloughs, and fresh-water marshes, where it associates with Gadwalls, Widgeons, teals, and Mallards. It is generally found in small flocks, which keep mainly by themselves. When alarmed, the birds rise straight into the air, making a noise with their wings, which usually serves to identify them. Ordinarily they fly rather slowly and hesitatingly, but are said to be capable of good speed. They are not particularly shy and often return to the same spot after being flushed. Describing their method of feeding, Bent says (1923, p. 140):

> The shoveller is more essentially a surface feeder than any other duck, dabbling along the surface to sift out what small particles of food it can find, shovelling in the soft muddy shallows and straining out its food much after the manner of a right whale. The tongue, the roof of the mouth, and the soft edges of the broad bill are all well supplied with sensitive nerves of touch and taste, which helps the bird to retain what it wants to eat and to reject worthless material. The shoveller seldom tips up to feed by semi-immersion, but paddles quickly along, skimming, with its head half submerged so that whatever is found is taken into the mouth, tasted by the sensitive tongue, and sifted out through the pectinated bristles of the bill if not wanted.

The same authority (p. 141) writes concerning the bird's voice:

> The shoveller has a small throat and a weak voice. It is usually silent, but the female sometimes indulges in a few feeble quacks and the male makes a low guttural sound like the syllables *woh, woh, woh*, or *took, took, took;* this sound has been likened by some writers to the sound made by turning a watchman's rattle very slowly.

FOOD.—A study of the food habits of the Shoveller by McAtee (1922, p. 380) showed a larger proportion of animal food taken (34 per cent) than is the case with most other ducks. The habit of straining out the bottom ooze, so pronounced in this species, results in the consumption of a greater quantity of minute aquatic organisms, such as ostracods, copepods, and diatoms. "The largest item of animal food is mollusks, practically all of them fresh-water univalves. They constituted 18.97 per cent of the total or more than half of the animal food of the Shoveller." Aquatic insects are next in importance, including water bugs, water beetles, caddis larvae, and dragon-fly nymphs. Small fishes and crustaceans made up the remainder of the animal food, the latter comprising a few crawfishes and large numbers of ostracods. The vegetable food, amounting to nearly 66 per cent of the total, consisted chiefly of seeds of sedges, pondweeds, grasses, smartweeds, and water lilies. McAtee concludes: "So far as known, the Shoveller damages no crop, nor does it feed upon any animals of pronounced value to man. On the other hand, it does devour various fish predators, as dragon-fly nymphs, giant waterbugs, water scorpions, water tigers, back-swimmers, and crawfishes."

WOOD DUCK: *Aix spónsa* (Linnaeus)

OTHER NAMES: **Summer Duck; Acorn Duck; Tree Duck; Squealer**

RECOGNITION MARKS.—Larger than the Blue-winged Teal; much smaller than the Mallard (length, 17 to 20 inches; spread, 28 to 29 inches). *Adult male* with a long crest and the head strikingly marked with purple, green, and white; throat white, with a spur running up toward the eye and another across side of the neck; breast marked with purplish chestnut; belly white; lower sides grayish olive, finely vermiculated and crossed by alternate bars of black and white on the flanks. *Female* has sides of head

mouse gray, with a conspicuous white eye ring and white patch behind the eye; breast olive brown, faintly streaked; wing with a conspicuous white bar. (Plate 18.)

RANGE.—Breeds locally nearly throughout the United States, north to southern British Columbia, southern Manitoba, southeastern Ontario, and central Labrador. Winters principally in southern United States north to Virginia, southern Illinois, and southern British Columbia, and south to central Mexico and Jamaica.

DISTRIBUTION IN FLORIDA.—Locally common over the greater part of the State, except the extreme southern portion, and believed to be increasing as a result of the protective law. It is reported as a common resident at Greenville, Pensacola, May's Pond (Jefferson County), Gainesville, Tarpon Springs, on the Chassahowitzka River, Wekiva River, Lake Okeechobee, Kissimmee River, at Maytown, Istokpoga Lake, and Punta Gorda. It has been observed at Miakka Lake, and has been known to breed in the region east of Chokoloskee. About 12 individuals were seen on Alligator Lake, March 31, 1926. In the big St. Johns marshes, west of Fellsmere, May 13, 1925, we flushed four or five pairs from among a thick growth of saw grass and arrowhead (*Sagittaria*). W. B. Grange found the species abundant on Lakes Jackson and Miccosukee; about 60 birds, including young on the wing, were seen on Lake Miccosukee, June 18 to 20, 1926. Stoddard observed 100 or more on the Wakulla River, April 23, 1927, being mostly broods of young, varying in size from little chicks to birds one-third grown. Nicholson saw an adult with 9 small young, May 10, 1930, 25 miles east of Carnestown.

Eggs were found at San Mateo, April 8 (1886); Archer, April 13 and May 4; and in Williams Hammock, near Bassenger, April 28 (1913). Brewster noted small young on the Wekiva River, March 19 and 20, 1877. Doubtless the winter population is augmented by the arrival of birds from the Northern States, but little is known of their migrations. Weston reports the birds more numerous at Pensacola in winter than in summer.

HAUNTS AND HABITS.—The Wood Duck lives in wooded swamps and cypress ponds and is rarely seen in the open. During the nesting season the birds are found usually in mated pairs, or in family parties after the young are hatched; the female performs all the duty of incubation and takes most of the care of the young. The nests are located in hollow stubs or deserted woodpecker holes, generally over or near a pond or stream, but sometimes some distance away, and at any height, from 4 to 50 or 60 feet above the ground. The eggs, varying from 8 to 15 (and rarely as many as 24), are laid on a bed of down from the mother's breast. The period of incubation is from 28 to 30 days, and the young remain in the nest hardly more than 24 hours. Several methods of reaching the ground have been described by reliable observers. Probably the usual method is for the young to climb by means of their sharp toe nails and bills to the mouth of the cavity, and flutter to the ground at the call of the mother, who then leads them to the water if the nest is at a distance from their natural element. Sometimes, however, the little birds are carried to water by the mother bird, one at a time, in her bill, or clinging to her back.

Wood Ducks procure most of their food from the surface of the water or on the land, where they pick up nuts, berries, or seeds. They are among the swiftest and certainly the most skillful flyers of any of their tribe. They flash through the bottomland forests

with great speed, occasionally rising above the tops of the trees, but more often threading their way through the upper branches with consummate skill, perhaps to disappear into a hollow limb so suddenly that one wonders if the bird has not injured itself in entering the cavity.

The notes of the Wood Duck are quite unlike those of other ducks, and are thus described by Eaton (1910, vol. 1, p. 201): "The call of the drake is a mellow *peet-peet*, but when frightened it utters a harsher note which is usually written *hoo eek, hoo eek*. The note of the duck, when startled, is a sharp *cr-r-e-ek, cr-r-e-ek, cr-r-e-ek*, somewhat like the drake's alarm note." All these notes are given in flight, and the peeping call is said to be always repeated several times before alighting with a bunch of decoys.

Food.—Examination of 413 stomachs of the Wood Duck in the Biological Survey (Mabbott, 1920, pp. 37–48) showed the food of this species to consist largely (90 per cent) of vegetable matter. Duckweed is the favorite food wherever it can be obtained, being found in 196 of the stomachs examined and amounting to 10 per cent of the total food. Cone scales and galls from cypress trees furnished the next largest item (9.25 per cent). Seeds of sedges and grasses are eaten in large quantities, especially wild rice, for which the birds seem to have a decided liking, since they often leave their accustomed feeding grounds in the timber and visit the marshes to feed almost exclusively on the wild rice. Other important items in the vegetable food of this species are the seeds and tubers of pondweeds, seeds of water lilies, wild grapes, and the fruit of the buttonbush, swamp privet (*Adelia acuminata*), and the water elm (*Planera aquatica*). Nuts seem to be a favorite food of the Wood Duck, and include acorns, beechnuts, and the bitter pecan, or water hickory (*Hicoria aquatica*). In addition to those mentioned, this species feeds to a lesser extent upon a great variety of seeds and wild fruits. The animal food amounts to nearly 10 per cent of the total, and consists chiefly of dragon flies, bugs, beetles, grasshoppers, crickets, and a few other insects, and a small quantity of crustaceans.

REDHEAD: *Nyróca americâna* (Eyton)

Other Names: **American Pochard; Red-headed Raft Duck**

Recognition Marks.—Larger than the Lesser Scaup (length, 17 to 23 inches; spread, 30 to 33 inches). *Adult male:* Forehead high, sloping abruptly to the bill, which is *concave in its upper profile;* head and upper neck chestnut, glossed with purple; breast fuscous-black; belly white; back and sides dark gray, finely vermiculated; fore wings gray, the primaries grayish brown or fuscous; *speculum light gray*. *Female* is distinguished from the Scaups and the Ringneck by the *gray speculum* and absence of white markings on the face; from the Canvasback by darker upperparts and shorter bill.

Range.—Breeds in Canada and parts of the United States, from central British Columbia and Great Slave Lake south to southern Wisconsin, central Nebraska, northern New Mexico, central Nevada, and southern California. Winters mainly in southern United States from Maryland, southern Illinois, Arkansas, and Colorado south to the West Indies and central Mexico; also on the Pacific coast from southern British Columbia south to Mexico.

Distribution in Florida.—Audubon (1838, p. 198) recorded the Redhead abundant in winter near St. Augustine. Single specimens were taken by Worthington, November 13 and 22, 1906, at Fernandina. H. L. Ferguson reported the species at the Chassahowitzka River, November 2, 1919, and February 3, 1920, and W. L. McAtee found it common on St. Vincent Island, November 8 and 9, 1910. R. W. Williams (1907a, p.

158) mentions the capture of several on Lake Jackson. S. R. Ingersoll reports a flock seen in the Halifax River, January 20, 1918, and Earle R. Greene saw a pair at Pablo Beach, November 22, 1925. F. M. Weston examined one taken at Pensacola, December 5, 1926, and another shot from a flock of 4, November 24, 1929. He noted it common also near the mouth of the Escambia River, November 12, 1927. W. O. Trumbo reports one killed from a flock of 12 or 15 in January, 1916, at Zellwood.

HAUNTS AND HABITS.—While in the South during the winter months, the Redhead frequents both the ponds of the interior and the bays and estuaries along the coast. It occurs at times in flocks of some size, but ordinarily mixes with Scaups, Canvasbacks, Widgeons, and other ducks, feeding in deep water by diving. The birds fly very swiftly, in V-shaped flocks, often at a considerable height. They are rather easily decoyed and furnish good sport for the hunter shooting from a blind or battery. The notes of the Redhead have been variously described. Doctor Yorke (1899, p. 38) says: "The redhead's cry whilst floating about in compact bunches resembles the mewing or cry of a cat, but their call is a very modest quack." Others have described the notes as a hoarse, guttural, rolling sound or a growl.

FOOD.—This species is one of the most valuable of our game ducks. It feeds extensively on wild rice, wild celery, pondweeds, coontail, and other aquatic plants; when fattened on such food, its flesh is nearly if not quite as good as that of the Canvasback. Forbush (1925, vol. 1, p. 234) says: "It eats fresh-water clams, snails, leeches, small fish, tadpoles, frogs, lizards and insects." Specimens taken on the coast of Alabama had eaten large quantities of salt-water snails.

RING-NECKED DUCK: *Nyróca collâris* (Donovan)

OTHER NAMES: **Black Duck; Blackjack; Bullneck; Bullhead; Ringbill; Ring-necked Scaup**

RECOGNITION MARKS.—About the size of the Lesser Scaup (length, 15.5 to 18 inches; spread, 25 to 30 inches). *Adult male:* Similar in markings to the Lesser Scaup, but with an indistinct *chestnut collar* around the neck, and a small triangular patch of white at base of lower mandible; *speculum gray;* sides, flanks, and lower belly pale smoke gray, with fine vermiculations; *back sooty black. Female* closely similar to female Scaup, but *speculum gray.* (Plate 9.)

RANGE.—Breeds in the interior of North America, from Great Slave Lake and southern British Columbia south to northern California, central Arizona, northern Nebraska, Iowa, and southern Wisconsin. Winters chiefly in southern United States north to Chesapeake Bay, southern Illinois, northern Arkansas, northern Texas, and southern British Columbia; also in the Bahamas and through Mexico to Guatemala.

DISTRIBUTION IN FLORIDA.—Williams, in Leon County, and Chapman, in the Gainesville region, report this species as the most common duck in winter, but elsewhere it is considered much less numerous than the Lesser Scaup. Stoddard and Handley (1925, p. 45) record a count of 1,298 individuals on Lakes Iamonia and Jackson, December 24, 1924. On Lake Jackson, November 12, 1927, Stoddard estimated there were 23,000 of these birds. W. C. Jernigan noted 67 birds on the Escambia River, November 12, 1927. Scott (1888c, p. 379) found the species numerous on Panasoffkee Lake in the winter of 1875–76. Specimens have been taken at De Funiak Springs, October 31, 1908; Eustis, January 15, 1923; Fort Myers, November 27, 1891; Banana Creek, March 14, 1890;

and Lake Harney, January 3, 1896. Maynard (1881, p. 451) reported the Ringneck as not uncommon at Key West about 1872. H. H. Bailey (1925a, p. 26) speaks of seeing "rafts" of these ducks in company with Scaups on the Indian River and Lake Okeechobee. M. N. Gist says they are common in winter on Orange Lake, at which place he counted 800 on March 10, 1928; a few cripples remained there through the following summer and were seen June 9 and August 11.

Haunts and Habits.—The Ringneck, in the South, frequents fresh-water ponds in the interior and, to a lesser extent, salt-water lagoons on the coast. The birds appear to have a preference for certain ponds, which they frequent regularly in numbers to the exclusion of other similar waters. The lakes in Leon, Jefferson, and Alachua Counties seem to be the most favored feeding grounds. The Ringnecks associate frequently with the Scaups, and procure their food in the same manner, by diving to the bottom in water of moderate depth—4 to 6 feet. According to Bent (1923, p. 228), the birds dive with their wings tightly closed and swim rapidly below the surface. At times they feed in shallow water or marshes. They fly swiftly, usually in small, open flocks, and their notes are similar to those of the Scaups.

Food.—The stomachs of more than 200 Ringnecks taken at Micanopy, Florida, have been examined in the Biological Survey, and although the proportions of the various food items have not yet been averaged, it is clear that the bulk of the food of these birds is of vegetable origin. Seeds of the water shield (*Brasenia*) were found in nearly every stomach, and seeds of bindweed (*Polygonum*), hornwort (*Ceratophyllum*), spike rush (*Eleocharis*), and of various other rushes and sedges were extensively eaten. A favorite food was the seeds of the water lily (*Castalia odorata*), some stomachs containing more than 700 of them. Bent (1923, p. 227) includes in the food of this species: Minnows, small frogs, tadpoles, crawfishes, snails, and insects.

CANVASBACK: *Nyróca valisinéria* (Wilson)

Other Names: **Whiteback; Bullneck; Horse Duck**

Recognition Marks.—About the size of the Redhead (length, 20 to 24 inches; spread, 34 to 36 inches); bill longer than head, wedge-shaped in profile; forehead sloping less abruptly than in the Redhead. *Adult male:* Neck russet, blackening on the throat, the red color extending farther down on neck than in the Redhead; *back pale silvery gray* (palest of all the Florida ducks); wings and other markings similar to those of the Redhead.

Range.—Breeds in western North America, from southern Minnesota, southern Wisconsin (casually), western Nebraska, northern New Mexico, northern Utah, and western Nevada north to central Alaska and northern Mackenzie. Winters chiefly in the United States, from Montana, Colorado, Arkansas, southern Illinois, and Maryland south to the Gulf coast and central Mexico; also on the Pacific coast from British Columbia southward.

Distribution in Florida.—Occurs locally as an uncommon winter resident. Pennock reports the capture of three specimens at St. Marks, November 20, 1914; four on December 14, 1914; and one on November 30, 1918. A hunter at that locality took 13 Canvasbacks during one winter. Two birds were seen on Lake Wimico, December 3, 1919, and several were shot near Tallahassee during the winter of 1905–6. The species was reported by H. L. Ferguson on the Chassahowitzka River, November 2, 1919, and

February 11, 1920. Pangburn (1919, p. 397) found it fairly abundant in Pinellas County in February and March, 1918. Weston records it at Pensacola, March 16, 1924, and March 10, 1928, when 35 birds were seen. It was reported present in moderate numbers on Lake Jessup, February 11, 1917, and in a marsh near Mayport, January 20, 1917. It is said to occur rarely on the Kissimmee River and in the region around Chokoloskee. C. A. Mosier noted a pair at Royal Palm Hammock in December, 1917.

HAUNTS AND HABITS.—Canvasbacks, in their winter quarters, frequent both the salt-water bays and estuaries along the coast and the fresh-water ponds and rivers. They occur often in large flocks, particularly at their favorite resorts in the coast region of Virginia and North Carolina, associating with Redheads, Scaups, and other diving ducks. Most of their food is obtained from the roots or buds of aquatic plants. The birds are expert divers and are able to swim for long distances under water and to reach depths of 20 or 25 feet. They are swift and strong flyers, and usually shy, challenging the skill of the gunner to secure a moderate bag of them. Concerning this species, Bent (1923, p. 126) writes:

> When migrating or when flying to and from their feeding grounds they fly in wedge-like flocks, usually at a considerable height and with more velocity than is apparent. When on the wing the canvasback can be recognized by the long, slender neck and head, carried in a downward curve, by the long pointed bill and by the sharp-pointed wings; it is a longer and more slender bird than the redhead; when sitting on the water it can be distinguished from the redhead or the scaups, almost as far as it can be seen, by the extreme whiteness of the back.

The note of the male is described as a harsh, guttural croak, and the female is said to quack almost as well as a Black Duck.

FOOD.—The favorite food of the Canvasback, at least at most of its winter resorts in the Eastern States, is the plant called wild celery (*Vallisneria spiralis*), and it is this food that is believed to impart the delicious flavor to the flesh of the bird. Bent (1923, p. 195) says: "The canvasback prefers to feed on the root of the plant only, which is white and delicate in flavor and said to resemble young celery; it is obtained by diving and uprooting the plant; the roots are bitten off and eaten and the leaves or stems are left to float away in tangled masses."

Examination of many stomachs in the Biological Survey shows that a variety of other vegetable food is taken, including the tubers of the delta duck potato (*Sagittaria platyphylla*) and of the yellow water lily (*Nymphaea*), and seeds of hornwort (*Ceratophyllum*), goosefoot (*Chenopodium*), water milfoil (*Myriophyllum*), pondweed (*Potamogeton*), ditch grass (*Ruppia*), bindweed (*Polygonum*), wild rice (*Zizania*), saw grass (*Cladium*), and various other sedges. The animal food found in the stomachs comprised gastropods, snails, beetles, chironomid larvae, and small fishes.

GREATER SCAUP DUCK: *Nyróca marîla* (Linnaeus)

OTHER NAMES: **Big Bluebill; Big Blackhead; Broadbill; Bullhead**

RECOGNITION MARKS.—Larger than the Lesser Scaup (which is the commonest species in Florida); length, 17 to 21 inches; spread, 29 to 35 inches. *Adult male:* Head, neck, and breast fuscous-black, *glossed with green;* bill grayish blue, or lead color; back fuscous varied with white (much darker than in the

Canvasback); *speculum white;* belly white. *Female:* Head and breast brownish drab, with a *large area of white at base of bill;* resembles the female Redhead, but differs in having a white speculum and white on the face.

RANGE.—Breeds in North America from the Arctic coasts of Alaska and Canada south to central Saskatchewan, central Alberta, and Manitoba; occasionally or formerly to northern Iowa, southern Michigan, and the Gulf of St. Lawrence. Winters on the Atlantic coast from Maine to Florida, on the Gulf coast to southern Texas, on the Pacific coast from the Aleutian Islands to southern California, and in small numbers on the Great Lakes and in the Southwestern States.

DISTRIBUTION IN FLORIDA.—This Duck is probably a fairly common winter resident in the northern parts, chiefly on the Gulf coast, but its close resemblance to the Lesser Scaup makes identification in the field very uncertain. It was reported as arriving in autumn at Ponce Park on October 10, 1912; at De Funiak Springs, October 29, 1909; and at Pensacola, November 3, 1917 (specimen taken). Weston notes the species as abundant at Pensacola in January, 1917, and R. W. Williams (1904, p. 451) gives it as a common winter resident in Leon County. Three specimens were taken at East Goose Creek, Wakulla County, January 7 and 14, 1920, and three were killed on St. Vincent Island, March 2, 1910. Francis Harper reported three Greater Scaups seen in a slough near the Apopka Canal, February 14, 1917. Pangburn (1919, p. 397) records the species in Pinellas County, March 4, 1918. A few were reported by Warden Kroegel on Pelican Island, Indian River, in January, 1914. Late spring records are furnished by R. J. Longstreet, at Daytona Beach, April 18, 1925, and by T. G. Pearson, at Passage Key, April 18, 1906. A still later record is furnished by two specimens now in the Florida State Museum, that were taken at St. Marks, May 23 and 24, 1913.

HAUNTS AND HABITS.—The Greater Scaup is found during the winter chiefly in the Gulf or on the bays and sounds along the coast, and occasionally on the larger rivers, associating to a large extent with the Lesser Scaup. Farther north, on the Atlantic coast, where it is much more abundant than in Florida, the birds gather in immense "rafts" on the salt-water bays or on the ocean, where they spend the day out of reach of human enemies. They feed in moderately deep water, preferably about 6 or 8 feet, procuring their food by diving to the bottom. They fly usually in compact flocks, at no great height above the water, frequently voicing their peculiar guttural call.

FOOD.—Of this species Bent (1923, p. 212) says:

> During the winter on the sea coast its food consists of surface-swimming crustaceans, crabs, starfish, and various mollusks; small mussels, obtained by diving in the mussel beds, form the principal part of its animal food at this season; but it also eats considerable vegetable food, such as the buds and rootstocks of wild celery (*Vallisneria*), and the seeds and succulent shoots of *Zostera marina.*

Examination of a large number of stomachs in the Biological Survey showed a decided preference by the birds for vegetable food. Among the plant food commonly eaten were seeds of ditch grass (*Ruppia*), wild rice (*Zizania*), *Panicum*, buttonbush (*Cephalanthus*), and pondweed (*Naias* and *Potamogeton*), and roots, stems, and leaves of wild celery (*Vallisneria*). The animal food included caddis-fly larvae, nymphs of May flies and dragon flies, aquatic beetle larvae, and small mollusks.

A bird collected at Micco, Florida, had eaten about 100 seeds of wax myrtle (*Myrica cerifera*) and no fewer than 7,680 seeds of *Salicornia ambigua.*

LESSER SCAUP DUCK: *Nyróca affínis* (Eyton)

OTHER NAMES: **Little Bluebill; Blackhead; Bullhead; Raft Duck; "Canvasback"; Creek Broadbill; Grayback**

RECOGNITION MARKS.—Length, 15 to 18 inches; spread, about 30 inches; adult male closely similar to the Greater Scaup, but smaller and *head glossed with purple* (showing green in some positions). *Females* of the two species are indistinguishable in the field. (Plate 9.)

RANGE.—Breeds in the northern interior of North America, from central Alaska and northern Canada south to Colorado, Iowa, southern Wisconsin, and northern Ohio. In winter, it ranges chiefly in southern United States, north to Maryland, southern Illinois, Arkansas, Colorado, and southern British Columbia, and south to the Bahamas, Lesser Antilles, and Panama.

DISTRIBUTION IN FLORIDA.—Throughout Florida this is the most abundant species of duck in winter and spring, often occurring in very large flocks. F. M. Bennett, writing in Bird-Lore (1910, p. 115), states that during a cruise along the Gulf coast of Florida, from Pensacola to Cape Sable and north to Hillsborough Inlet, in the winter of 1910, he found this species in great numbers in practically all the bays along the coast. He says:

> In Tampa Bay and in the upper end of Key Biscayne Bay, north of Miami, the flocks seen were really enormous, extending sometimes two or three miles along the surface of the water, and numbering tens of thousands of individuals. . . .

On April 11, 1910, in the western end of Apalachicola Bay, "he observed, a few miles apart, three separate flocks or 'rafts' of these birds feeding in shoal water, and each flock contained from two thousand to three thousand individuals."

Migrants from the North appear in northern Florida usually early in October; first arrivals were noted at the Chassahowitzka River, October 8, 1916; St. Marks, October 18, 1919; Ponce Park, October 20, 1912; and Fernandina, October 22, 1906. In spring, the bulk of the birds remain until about the first of May, and stragglers are often seen until the middle of June, or even the first of July. C. J. Pennock reports a flock of 9 birds at St. Marks on July 1, and two birds on July 8, 1913, after which they were seen no more until October. F. M. Weston observed a bunch of 6 birds that remained at Pensacola until July 1; two females stayed until July 4, and one was seen daily until well into August (1919). R. W. Williams (1907a, p. 158) records an instance of this species breeding on Lake Jackson in the summer of 1896. The female was flushed from her nest of 8 eggs by Dr. E. M. Brevard. R. J. Longstreet captured an emaciated female of this species in eclipse plumage at Shell Point, Wakulla County, July 27, 1924.

Lesser Scaups are found in abundance, not only on the coasts of Florida, but in the lakes and rivers of the interior. On February 8, 1917, Francis Harper estimated the number seen on Lake Okeechobee at 12,000, a single flock near the northern shore containing about 10,000 birds. Smaller flocks are found on practically all the lakes in the northern and central parts of the State. On the southwest coast and the Keys the birds occur in moderate numbers. C. J. Pennock reported them common in Whitewater Bay, March 21, 1922, and J. T. Nichols observed them in moderate numbers around the Keys southeast of Cape Sable during the first half of April, 1917.

HAUNTS AND HABITS.—During the colder part of the year, from October to May, the Lesser Scaup may be found on almost all the waters of the State—ponds, lakes, rivers,

bays, and the Gulf. The birds live mostly in flocks of their own species, feeding by diving in moderately shallow water. They are usually rather unsuspicious and may be approached rather closely in a small boat. Where they receive protection, as in the Halifax River and Lake Worth, they become very tame, and will almost take food from a person's hand. The birds remain in either large or small flocks during the winter and until well into the spring. Their flight is swift and somewhat erratic, the birds generally flying at a moderate height and in rather closely bunched flocks that present a broad front. They may be readily decoyed, but are not much sought by hunters in Florida. They are silent for the most part, but sometimes in flight a flock may be heard uttering their peculiar guttural, purring notes, which are said to be produced only by the females.

Food.—According to Bent (1923, p. 221), the animal food of the Lesser Scaup "consists of small fry and fish spawn, tadpoles, pond snails and other small mollusks, worms, crawfish, water insects, and larvae." Baker (1890, p. 267) examined eight specimens at Micco, all of which contained mollusks, chiefly *Rissoina cancellata.* Stomachs examined in the Biological Survey contained mollusks of the genera *Planorbis, Nassa,* and *Odostomia;* also dragon-fly nymphs, caddis cases, and beetle larvae. The vegetable food comprised seeds of the white water lily (*Castalia*), pondweed (*Naias* and *Potamogeton*), buttonbush (*Cephalanthus*), water shield (*Brasenia*), water milfoil (*Myriophyllum*), ditch grass (*Ruppia*), bindweed (*Polygonum*), saw grass, and various sedges and rushes.

AMERICAN GOLDEN-EYE: *Glaucionétta clángula americána* (Bonaparte)

Other Names: Whistler; Garrot; Brasseye

Recognition Marks.—Larger than the Lesser Scaup (length, 16.5 to 23 inches; spread, 27 to 32 inches); bill short, and very high at base. *Male:* Head and upper neck black with a green gloss (or sometimes fuscous-black), with a *circular white spot* on face in front of eye; back and wings blackish, with *a large amount of white on the wings. Female:* Head, Prout's brown (without white spot); chest neutral gray; back fuscous-black, marked with gray. "In flight the puffy head gives the bird an extremely short-necked appearance which is very noticeable. . . . Both sexes are famous for the musical whistling of their wings, which has a humming resonant quality, and is audible at a very great distance" (Griscom, 1922, p. 72).

Range.—Breeds in northern North America from central Alaska, Great Slave Lake, and northern Labrador south to interior British Columbia, northern Montana, northern Minnesota, northern Michigan, northern New York, and northern New England. Winters on the Atlantic coast from Maine to Florida, on the Gulf coast south to Texas, and on the Pacific coast from the Aleutian Islands south to southern California and western Mexico; also irregularly in the interior.

Distribution in Florida.—Cory (1896b, p. 231) speaks of this species as occurring more or less regularly on the Indian River. Scott (1888c, p. 379) mentions a bird taken January 9, 1888, at the mouth of the Anclote River, and G. Clyde Fisher (1910e, p. 205) gives two records from De Funiak Springs, December 5, 1907, and November 20, 1909. On January 2, 1912, Ludlow Griscom saw 4 birds in Leon County. H. H. Bailey (1925a, p. 26) observed several of the birds on Lake Okeechobee in March. C. J. Pennock records a male seen on the Wakulla River, December 8, and a female killed there December 10, 1919. R. G. Porter, of Apalachicola, reported three killed from a bunch of five near the mouth of the Aucilla River, about November 20, 1919. H. L. Stoddard found the birds fairly common, December 26 to 29, 1928, along the Gulf coast from

Wakulla Beach to Pinhook River. Weston says the species is uncommon at Pensacola, but noted birds there on November 29, 1925; February 21, 1926; February 27, 1927; January 8, 1928 (27 birds); and December 8, 1929 (10 birds). A specimen in the Museum of Comparative Zoölogy was taken at Cape Canaveral, March, 1912, by Gardner Perry. H. L. Ferguson reports having killed several in the Whitewater Lakes, near Cape Sable.

HAUNTS AND HABITS.—The Golden-eye is found in winter chiefly along the sea coast, living in the bays and lagoons, the mouths of the larger rivers, and in the Gulf. The birds are expert divers, and most of their food is procured from the bottom, normally at depths of 8 or 10 feet or less. Their flight is swift and strong, and accompanied by a musical whistling of the wings, which gives the birds one of their common names. They travel in small companies, usually rather high in air.

FOOD.—Commenting on the food of this species, Bent (1925, p. 7) says: "While with us on the coast the golden-eye feeds largely on small mussels and other mollusks, which it obtains by diving in deep water or by dabbling in the shallows near the shore; it feeds to some extent also on the seeds of eel grass (*Zostera marina*)."

Examination of stomachs in the Biological Survey showed a considerable variety of food taken, including crabs, crawfishes and other crustaceans, small fishes, caddis-fly cases, buds of wild celery, tubers of nut grass (*Chara*), and seeds of water lilies (*Nymphaea*), pondweed (*Potamogeton*), and of sedges. On the coast of Alabama the bird is sometimes called "fiddler duck," from its habit of feeding on fiddler crabs.

BUFFLE-HEAD: *Charitonétta albéola* (Linnaeus)

OTHER NAMES: **Butterball; Spirit Duck; Dipper; Marionette**

RECOGNITION MARKS.—About the size of the Green-winged Teal (length, 12 to 15 inches; spread, 22 to 25 inches). *Male:* Head and neck very puffy, varied with purple, green, and violet; a *large triangular white* patch on crown and occiput, reaching on sides to beneath the eye; back black; rest of body white. *Female:* Head less puffy than in male, purplish black; neck and upperparts dark brownish gray, shading to black; an *elongated white patch* on sides of head and another on secondaries.

RANGE.—Breeds chiefly in the northern interior of the continent, from west central Alaska and northern Mackenzie south to southern British Columbia and northern Montana, and east to northern Ontario. Winters on the Pacific coast from the Alaska Peninsula south to Lower California, on the Atlantic coast from Maine to Florida, and in the interior from southern British Columbia and northern Montana to the Gulf coast.

DISTRIBUTION IN FLORIDA.—Occurs as an uncommon winter visitor, chiefly on the northern Gulf coast. Evermann (1886, p. 82) noted a few at Pensacola in March or April, 1886, and Weston reported the species there November 24, 1918; December 25, 1925; and January 2, 1927. Scott (1881, p. 21) observed a male at the mouth of the Withlacoochee River in January, 1880, and took an adult female at Tarpon Springs, in November (Catalogue Birds British Museum, vol. 27, p. 388, 1895). Pennock noted the bird in small numbers at St. Marks on several different occasions—January 13, 26, February 26, 1917, and December 11, 1919. R. W. Williams (1914, p. 495) records a specimen killed on Lake Jackson, December 7, 1908. Stoddard reports the species as a regular winter visitant in small numbers on the lakes of Leon County. One bird was

seen by G. Clyde Fisher at De Funiak Springs, November 27, 1909, a few by Ludlow Griscom at Goose Creek, Wakulla County, in December, 1915, and a flock by H. L. Ferguson on the Chassahowitzka River, in 1918. R. G. Porter reports three killed near the mouth of Aucilla River in the fall of 1919. On the Atlantic coast there are very few records. Longstreet mentions one bird at Ormond, December 6 and 24, 1924, and S. R. Ingersoll speaks of a few seen near Mosquito Inlet in December and January, 1917–18.

HAUNTS AND HABITS.—The little "Butterball" frequents the bays, lagoons, and sounds along the coasts, feeding usually in water about 10 or 12 feet deep, or less. It is an expert diver and very quick in its motions. It can swim swiftly under water and procures most of its food from beneath the surface. The birds are perfectly at home in the surf and ride the roughest waves without difficulty. In Florida they generally occur singly or in small companies, and because of their small size and plain colors attract little attention. Their flight is swift, and performed at no great height above the water.

FOOD.—Examination of stomachs in the Biological Survey indicates that the birds take many gastropods (*Planorbis*), crabs and other crustaceans, and occasionally small fishes and insect larvae. The vegetable food includes the seeds and tubers of pondweeds (*Naias* and *Potamogeton*), wild celery buds, and seeds of sedges.

OLD-SQUAW: *Clángula hyemális* (Linnaeus)

OTHER NAMES: **Long-tailed Duck; Oldwife; South-southerly**

RECOGNITION MARKS.—About the size of the Lesser Scaup (length, about 18 inches; spread, 26 to 30 inches; bill about one inch). *Male in winter:* Head and neck mainly white, with fuscous on crown and a large patch on side of head; chest, fore back, and wings fuscous, the long scapulars white; "in flight Old-squaws show dark brown and white in patches; these marks, with dark wings, give . . . a queer spotted or pied appearance" (Forbush, 1925, vol. 3, p. 257).

RANGE.—Breeds on the Arctic coasts of both hemispheres; in North America, south to northern Labrador, Hudson Bay, and the Aleutian Islands. Winters on the Atlantic coast from the Gulf of St. Lawrence to Florida and the coasts of Alabama and Louisiana; on the Pacific coast from the Aleutian Islands south to southern California; and on the Great Lakes.

DISTRIBUTION IN FLORIDA.—Occurs as a rare winter visitor. Cory (1896a, p. 233) stated that he had occasionally taken specimens on the Banana River, and that in the winter of 1894–95 he saw a number of birds at Lake Worth. The same author (1895, p. 188) also records two taken near Titusville in December, 1894. Williams considers the bird rare in Leon County, reporting one specimen which he had in his possession for some years. Weston saw one bird at Pensacola, March 12, 1917, and another, February 28, 1926. A specimen in the United States National Museum was taken at Tampa, November 26, 1879. On January 17, 1927, H. L. Stoddard shot one on Lake Iamonia, and on February 4, 1927, Sidney Stringer reported four seen on Lake Jackson. One was taken at Wakulla Beach, January 17, 1930, and a bunch of five was seen there by Mrs. J. L. Hall in December, 1929.

HAUNTS AND HABITS.—The Old-squaw is one of the hardiest of our ducks, and only rarely winters as far south as Florida. It is a bird of the open sea, perfectly at home in

the roughest water, riding the waves easily or diving under the breakers. It is one of the most expert of the diving ducks and has been observed to remain under water for periods of 30 to 45 seconds. According to Barrows, the birds are frequently caught in gill nets set at a depth of 30 fathoms (180 feet). They feed at times in the bays, harbors, and larger lakes, mainly in deep water, but sometimes along the beaches. Their flight is swift and very erratic, the birds flying in irregular flocks or in Indian file, though rarely in a straight line. Bent says (1925, p. 44): "Old squaws can generally be recognized at a long distance by their peculiar method of flight and by their striking color pattern, the white head and neck and the short, sharp-pointed, black wings being very conspicuous."

The Old-squaw has a famous voice, loud and musical, which has been variously interpreted by different observers. Langille (1884, p. 466) thus describes the notes: "*Ow-ow-ly, ow-ow-ly, ow-ow-ly,* frequently repeated in succession, the first two notes considerably mouthed, and the last syllable in a high, shrill, clarion tone, may suggest the queer notes to anyone whose ear is familiar with them."

Preble (1908, pp. 289, 290), from observations of the bird on the Mackenzie River in May, refers to its notes as follows:

> The various tribes of the north designate the species by names derived from its characteristic note, and these names have been adopted to some extent by the whites. The Crees along the Athabaska call it *ca-ca-wee';* the Chipewyans and related tribes of the Slave and Mackenzie rivers refer to it as *a-ha-lik';* while the Eskimo are said to give it the name *a-hau-lin'*. . . .
>
> The birds, usually in small flocks, floated down with the current among the ice floes, occasionally rising and winging their way swiftly upstream to regain lost ground. The males played about on the water, chasing each other and uttering their loud, clear notes, which soon became associated in the mind with the long, cool evenings of the Arctic spring, with the sun hanging low in the northwestern horizon. When they are lightly swimming about, the long tails are elevated at an angle of about 45°, and with their striking color pattern the birds present a very jaunty appearance.

Food.—Bent (1925, p. 43) states that the principal food of these birds consists of mollusks, which are supplemented by shrimps, sand fleas, crustaceans, beetles, marine insects, seaweed, and the roots, leaves, buds, and seeds of various aquatic plants. Mackay (quoted by Bent) adds fresh-water clams, small white perch, small catfish, small blue-claw crabs, and pond grass.

EASTERN HARLEQUIN DUCK: *Histrionicus histrionicus histrionicus* (Linnaeus)

Other Names: **Lord-and-lady; Glacier Duck; Rock Duck; Squealer**

Recognition Marks.—About the size of the Lesser Scaup (length, 15 to 17 inches; spread, 24 to 27 inches); bill shorter than head, narrowing toward tip. *Adult male:* Head and upperparts mainly slate-blue; a large white patch on side of head in front of eye and two smaller patches behind the eye; a conspicuous white collar around lower neck and a white bar across each shoulder; underparts solid clove brown; a large russet patch on each side, reaching nearly to the rump. *Female:* Head, upperparts, and wings fuscous; underparts dull white, mottled with drab; a white spot on side of head and another larger one in front of eye. These *two* spots, together with *absence of white in the wing,* will distinguish the bird from female Bufflehead.

Range.—Breeds in Iceland, southern Greenland, Baffin Island, and northern Labrador. Winters on the Atlantic coast south to Long Island, and casually to South Carolina and Florida. (Another race occurs in western North America.)

DISTRIBUTION IN FLORIDA.—There is but one undoubted record of the bird in the State—a specimen taken March 20, 1886, at Pensacola (Evermann, 1886, p. 82). Longstreet's record (1910c, p. 152) of two females seen in the Indian River, November 18, 1910, is considered too doubtful for acceptance, Mr. Longstreet concurring in this decision.

HAUNTS AND HABITS.—The Harlequin in winter is a bird of the sea coast, though it makes its summer home in the lakes and streams of the interior. It is a lover of rough water, and on its breeding grounds is seldom found away from rapids. Floating in small companies down the most turbulent of rapids, the birds take every possible advantage of the eddies and currents in their search for the aquatic insects and other invertebrates and small fishes on which they depend. On its wintering grounds the Harlequin procures most of its food from the surf near shore or about rocky ledges. The birds usually occur in flocks by themselves or in company with Old-squaws. Bretherton (quoted by Bent, 1925, p. 56) describes the note of this species as "a shrill whistle descending in cadence from a high to a lower note, commencing with two long notes and running off in a long trill."

WHITE-WINGED SCOTER: *Melanitta deglândi* (Bonaparte)

OTHER NAMES: White-winged Coot; White-eyed Coot; Sea Brant

RECOGNITION MARKS.—About the size of the Mallard (length, 19.5 to 23 inches; spread, 33 to 41 inches). *Male:* General color solid black, becoming fuscous on the belly; a *prominent white patch* in the wing; small white spot beneath the eye. *Female:* Upperparts fuscous; underparts dark drab, shaded with white on belly; distinguished from female American Scoter by *white wing patch* and white mark on side of head.

RANGE.—Breeds from about tree limit in northern Alaska and Canada south to northeastern Washington, North Dakota, Manitoba, and the Gulf of St. Lawrence. Winters on the Atlantic coast from the Gulf of St. Lawrence to South Carolina, and casually to Florida; on the Pacific coast from the Aleutian Islands to Lower California; and on the Great Lakes, and casually south to Louisiana.

DISTRIBUTION IN FLORIDA.—There are three records, one from the east coast and two from the Gulf coast. Cory (1896a, p. 234) states that he found the species on the Banana River and Lake Worth during the winter of 1894–95; Dr. A. B. Cannon (in a letter to the Biological Survey) describes the observation and capture of one male and four females in the Suwannee River, 8 miles below Old Town, October 20, 1917. F. M. Weston reports two birds seen near Pensacola, November 12, 1927.

HAUNTS AND HABITS.—This Scoter is much like the other species in habits; its flight is seemingly heavy and labored, but when well under way it attains a good speed. It is a strong swimmer and an expert diver, feeding, according to Bent (1925, p. 135), "mainly on small mussels and other small mollusks which it obtains by diving about the submerged ledges, often to a depth of 40 feet, tearing, with its powerful bill, the shellfish from the rocks to which they are firmly attached."

FOOD.—Examination of stomachs of this species in the Biological Survey indicates that its food consists largely of shellfish, *Mytilus edulis* and *Pecten irradians* being most frequently taken. In addition, crabs, caddis-fly cases, May-fly nymphs, water beetles, buds of wild celery, and rootstocks of *Potamogeton* were found in the stomachs.

SURF SCOTER: *Melanitta perspicillâta* (Linnaeus)

OTHER NAMES: **Sea Coot; Skunkhead; Surf Duck; Horsehead**

RECOGNITION MARKS.—Smaller than the White-winged Scoter (length, 18 to 22 inches; spread, 30 to 36 inches). *Male:* Bill chiefly orange-red with a large round, black spot on each side at base; plumage solid black, except for a white patch on crown and another on back of neck. *Female:* Plumage fuscous, mottled below with grayish white; *two irregular* (sometimes indistinct) *white patches on sides of head.*

RANGE.—Breeds from about tree limit in northern Alaska and Canada south to Alberta, northern Saskatchewan, James Bay, and the Gulf of St. Lawrence. Winters on the Atlantic coast from the Bay of Fundy to Florida; on the Pacific coast from the Aleutian Islands to Lower California; and on the Great Lakes (rarely south to Louisiana).

DISTRIBUTION IN FLORIDA.—According to Cory (1896a, p. 235), this Scoter was common about Lake Worth in the winter of 1894–95. Chapman (1888b, p. 319) records one killed January 29, 1888, near Punta Rassa. In the collection of the Museum of Comparative Zoölogy is a specimen taken at St. Augustine, March 22, 1896. Another specimen, now in the Biological Survey collection, was taken May 12, 1923, on Talbot Island. B. J. Pacetti reported the species at Ponce Park in the fall of 1912, four birds being seen on October 18, 19, and 20. R. J. Longstreet saw two birds, February 4, 1923, and another individual many times between March 21 and April 11, 1925, at Daytona Beach. S. R. Ingersoll reports one seen on Mosquito Lagoon, May 23, 1924, and Lester W. Smith (1920, p. 349) records one on St. Lucie River (date not given).

HAUNTS AND HABITS.—This is the commonest of the three species of scoters in Florida, and is the one most likely to be seen in the bays or sounds or on the ocean. It can usually be distinguished by the white patches on the forehead and nape, although the females are sometimes very obscurely marked. The birds feed by diving in the manner of the other sea ducks. Bent (1925, p. 148) thus describes their feeding habits:

> The large beds of the common black mussel which are so numerous and so extensive in the tidal passages of our bays and harbors or on outlying shoals are their favorite feeding grounds. Large flocks, often immense rafts, of scoters spend the winter within easy reach of such beds, which they visit daily at certain stages of the tide; although they can dive to considerable depths to obtain food if necessary, they evidently prefer to feed at moderate or shallow depths and choose the most favorable times to visit the beds which can be most easily reached.

Of their voice, Mackay (1891b, p. 284) says:

> My experiences show that all the scoters are unusually silent and seem to depend entirely on their sight in discovering their companions. I have rarely heard the surf scoter make any sound, and then only a low guttural croak, like the clucking of a hen; they are said to utter a low whistle.

FOOD.—Bent (1925, p. 148) says of this species:

> Their food consists almost entirely of various small mollusks, such as mussels, sea clams, scallops, and small razor clams. . . . A small amount of vegetable matter, such as eelgrass and algae, is often taken in with the other food, perhaps only incidentally.

Stomachs examined in the Biological Survey showed that, in addition to mollusks and crabs, the birds feed to some extent on buds of wild celery, stems of pondweeds (*Potamogeton*), and seeds of ditch grass (*Ruppia*).

AMERICAN SCOTER: *Oidémia americána* Swainson

OTHER NAMES: **Black Coot; Sea Coot; Black Butterbill; Yellownose**

RECOGNITION MARKS.—Smaller than the Black Duck (length, 17 to 20 inches; spread, 29 to 34 inches). *Male:* Solid glossy black above, paler beneath; base of bill swollen, bright orange. *Female:* Upperparts and wings fuscous; underparts dark drab, shaded with dull buffy whitish.

RANGE.—Breeds in northern North America and northeastern Asia; in America, from northern Alaska and northern Mackenzie south to James Bay and Newfoundland. Winters on the Atlantic coast from the Gulf of St. Lawrence to New Jersey, and rarely to South Carolina and Florida; on the Pacific coast from the Aleutian Islands to southern California; and irregularly in the interior from the Great Lakes south to Louisiana.

DISTRIBUTION IN FLORIDA.—The records are all on the east coast. Cory (1896a, p. 234) states that he has killed specimens on the Indian River and has seen the bird on Lake Worth. Worthington observed the species at Amelia Island, February 2, 1906, and again November 21 and 22, 1906; Earle R. Greene (1925b, p. 579) saw a single bird in the surf close to shore at Atlantic Beach, May 17 and June 14, 1925, and R. J. Longstreet noted one at Daytona Beach, December 14 and 20, 1925. M. T. Irwin found one dead on the beach at Sebastian, about December 21, 1921; this specimen was identified by the Biological Survey.

HAUNTS AND HABITS.—All the Scoters are sea ducks, living mainly on the ocean or in the salt-water bays along the coast. This species is not easy to distinguish from the other two, but at a moderate distance the males may be recognized by their solid black color. The birds, in places where they are numerous, occur in large or small flocks, flying in irregular bunches or in long lines rather close to the water. They feed mainly on shell fish, which they procure from the bottom by diving. According to Mackay (1891b, p. 280), "they can feed in about 40 feet of water, but prefer less than half of that depth." Their notes are described by the same author as "a musical whistle of one prolonged note."

RUDDY DUCK: *Erismatúra jamaicénsis rúbida* (Wilson)

OTHER NAMES: **Spiketail; Wiretail; Sleeper; Dip-tail Diver; Fool Duck; Broadbill Dipper; Booby; Dumb Bird; Bumble-bee Coot; Hardhead**

RECOGNITION MARKS.—About the size of the Blue-winged Teal, but with shorter wings (length, 13.5 to 17 inches; spread, 20 to 24 inches); bill broad, high at base, its upper profile concave; tail feathers narrow, pointed, stiffened, often held erect. *Male:* Top of head black; sides of head white; upperparts and neck mahogany red. *Female:* Upperparts fuscous, mixed with russet; throat dark drab; underparts silvery white, shaded with drab. (Plate 9.)

RANGE.—Breeds in the interior of North America, from Great Slave Lake and Hudson Bay south to Iowa, Minnesota, northern Illinois, central Texas, central Arizona, and northern Lower California; also casually eastward to Maine and Massachusetts. Winters on the Atlantic coast from Massachusetts to Florida, the Bahamas, and the West Indies; on the Pacific coast from southern British Columbia to Lower California and Costa Rica; and in the interior from southern Illinois and Pennsylvania to central Arizona.

DISTRIBUTION IN FLORIDA.—Occurs locally as a common winter resident, most numerous on interior lakes. Audubon (1838, vol. 4, p. 328) says: "In February, 1832, I saw immense flocks of Ruddy Ducks about a hundred miles up the St. John's in Florida."

Maynard (1874b, p. 226) speaks of the bird as abundant in February, 1872, in the Indian River marshes. At present, however, it is much less numerous on the east coast than in the early days. Worthington noted the bird at Fernandina, October 29 and November 12, 1906, and took a specimen there May 17, 1907. One was seen by Longstreet November 19 and 20, 1924, at Daytona Beach. Keck (1903, p. 68) reports the species "not common" at Melbourne, March 10, 1903. Beers recorded it on the Kissimmee River, near Bassenger, February 23, 1907, and M. M. Green noted a pair of the birds at Hypoluxo, on Lake Worth, in May, 1889. On February 19, 1917, Francis Harper observed a flock of about 10 birds in the marshes on Merritt Island.

R. W. Williams (1907a, p. 158) speaks of the Ruddy as one of the most numerous species of ducks found in Leon County during the winter. Stoddard and Handley (1925, p. 45) record 102 birds seen on Lakes Iamonia and Jackson, December 24, 1924. Chapman reports the species common at Gainesville in winter, and Scott (1888c, p. 379) gives it as occurring frequently at Tarpon Springs. He took a specimen at Fort Myers, November 27, 1891, and on September 1, 1917, Capt. J. F. Menge observed a bunch of 14 Ruddy Ducks in the river a few miles above that city. Pennock records single birds seen at St. Marks, November 20, 1913, and November 20, 1918. It is reported to be very rare on St. Vincent Island, but one was taken there, January 15, 1910. Weston considers it very rare at Pensacola, having seen single birds on February 6, 1918, and February 14, 1926. Recent reports from waterfowl census observers record 14 at Plant City, December 10, 1927; 60 at McIntosh, January 7, 1928; 300 at Chosen, January 7, 1928; and 450 on Lake Apopka, February 11, 1928.

HAUNTS AND HABITS.—The Ruddy Duck differs in several respects from all the other ducks. In appearance it is distinctive—short, chunky body; thick, short neck; large feet; small, rounded wings; and stiff, pointed tail feathers. The birds swim with the body deeply immersed, dive in a flash and swim easily under water. When they are riding on the water, the peculiar, pointed tail is carried nearly perpendicular or even directed forward. The birds are able to sink completely below the surface without diving, and thus escape under water. They are quite unsuspicious and prefer to seek safety by submerging rather than by flying. On a small pond, therefore, they fall an easy prey to the gunners. They rise from the water with some difficulty, but when once under way the little birds make good speed, flying in moderate-sized flocks in a jerky fashion. They resort to both fresh- and salt-water lagoons, but their favorite feeding grounds are the shallower ponds and lakes in the interior, or the brackish bays near the mouths of the larger rivers, where they associate with other species of ducks and very often with the large flocks of Coots that frequent such waters.

FOOD.—In discussing this bird, Bent (1925, p. 157) says:

> Being decidedly a diving duck, the ruddy duck obtains most of its food on the bottom and subsists very largely on a vegetable diet, hence its flesh is usually well flavored. While living on the inland ponds, marshes, and streams, it feeds on the seeds, roots, and stems of grasses and the bulbs and leaves of aquatic plants, such as flags, teal moss, wild rice, pond lilies, duckweed, and wild rye.

Examination of stomachs in the Biological Survey confirmed the statement concerning the bird's preference for a vegetable diet; the contents included buds of wild celery and arrowhead (*Sagittaria*), stems and seeds of pondweeds (*Potamogeton* and *Naias*),

seeds of eelgrass (*Zostera*), ditch grass (*Ruppia*), water lily (*Castalia*), hornwort (*Ceratophyllum*), bindweed (*Polygonum*), and of various sedges and rushes. The animal food included Chironomid larvae, dragon-fly nymphs, snails, and mussels.

HOODED MERGANSER: *Lophódytes cucullátus* (Linnaeus)

OTHER NAMES: **Hooded Sheldrake; Wood Sheldrake; Swamp Sheldrake; Hairyhead; Spikebill; Fuzzyhead**

RECOGNITION MARKS.—About the size of the Wood Duck, or slightly smaller (length, 17 to 19 inches; spread, 24 to 26 inches). *Adult male:* Narrow, fan-shaped white head crest, bordered above with black (female Bufflehead has a *broad* white crest, without black border); two black bars on sides of breast. *Female:* Crest cinnamon; *neck* and *breast mouse gray;* bill shorter than the Red-breasted Merganser's (1.5 inches).

RANGE.—Breeds locally throughout temperate North America, from central British Columbia and Great Slave Lake south to Oregon, northern New Mexico, Arkansas, and the Gulf States. Winters mainly in southern United States, north to Massachusetts, Lake Michigan, Nebraska, Colorado, Utah, and British Columbia.

DISTRIBUTION IN FLORIDA.—Occurs sparingly in the northern part, probably more numerous in winter than in summer. It is reported as a common winter resident in Leon County (R. W. Williams); rare in winter at Gainesville (Chapman); uncommon at St. Marks (Pennock); and common in winter at Seven Oaks. Specimens were taken at Amelia Island, January 3, 1918; Fort Christmas, November, 1929; Lake Wilmington, December, 1929; Lukens, January 6, 1909; St. Marks, December 25, 1914; Clearwater, March 6, 1880; and Tarpon Springs, November 27, 1886, and January 18, 1890. Griscom reports the latest date the bird was seen in spring at Lake Iamonia as March 24, 1919. Longstreet records 7 seen at Port Orange, December 24, 1925, and one at New Smyrna, March 13, 1926. Worthington mentions a few seen at Persimmon Hammock on the St. Johns River, January 24 and 31, 1905. On February 5, 1920, Barrett saw four adult males near Cromanton, St. Andrews Bay, and on January 19 and 24, 1920, we noted a pair about 3 miles off the mouth of the Aucilla River. Weston records four birds seen near the mouth of Perdido Bay, November 22, 1925. E. J. Brown took one specimen at Lemon City. Brewster (1878a, p. 40) reported this species breeding commonly on the Wekiva River in March, 1877, and young about a week old seen on St. Johns River, near Blue Spring, March 28, 1877. These seem to be the only definite breeding records in the State, but doubtless many other instances will be found on further exploration.

HAUNTS AND HABITS.—The Hooded Merganser, during the breeding season, frequents secluded ponds and wooded sloughs in the interior, but in winter it is found also in the salt-water bays and estuaries and occasionally on the Gulf near shore. It is perhaps not quite so shy as the larger mergansers, but is very adept at concealing itself, especially when swimming among bushes and trees in the overflowed bottoms. At such times it dives like a flash and swims under water to a place of concealment, and thus often escapes the hunter. The birds fly very swiftly and make their way through heavy woodland with surprising agility. When swimming under water they are said to use both wings and feet. Their notes are described as harsh and guttural or croaking.

The nests of this species are placed usually in hollow trees or stubs, sometimes in a fallen hollow log or a hole in the ground (Bent). From their home in the tree the young

PLATE 23

EXPLANATION OF PLATE 23

BIRDS OF THE SALT MARSHES

Extensive salt marshes border the barrier islands and lagoons on large portions of both the Atlantic and Gulf coasts of Florida. This scene pictures conditions in winter on Merritt Island. The flying birds are Florida Ducks, female (left) and male; on the water are six Black Ducks; on the ground, from left to right are a Wayne's Clapper Rail, a Black Rail, a Wilson's Snipe, and a Spotted Sandpiper.

PLATE 23

either may climb out of the nest cavity and flutter to the ground or water beneath, or in some cases may be carried by the mother bird, one at a time, in her bill to the nearest water. Once in their natural element, the family, under the skillful guidance of the old bird, is fairly safe from most enemies.

FOOD.—The food of the Hooded Merganser, as determined by the examination by W. L. McAtee, of 80 stomachs in the Biological Survey, was found to consist of fishes, 37 per cent; crawfishes, 35 per cent; other crustaceans, 3 per cent; insects, 8 per cent; miscellaneous animal matter, chiefly frogs, 12 per cent; and vegetable matter, 4 per cent. Thirteen kinds of fishes were identified in the stomach contents, including catfish, minnows (*Cyprinidae*), killifish, sunfishes, yellow perch, and sticklebacks. The vegetable matter included seeds and other parts of pondweeds, winter buds of wild celery, acorns, and other seeds. McAtee considers that the destruction of crawfishes more than offsets any damage the bird may do to food fishes.

AMERICAN MERGANSER: *Mĕrgus mergânser americânus* Cassin

OTHER NAMES: **Goosander; Sheldrake; Big Sawbill**

RECOGNITION MARKS.—Mergansers in flight show a long neck, long, *narrow, strongly-hooked bill,* and much white in the wings; they usually fly in long lines in single file. The American Merganser may be distinguished from the Red-breasted by its larger size (length, 21 to 27 inches; spread, 34 to 39 inches) and by the color of the head and neck (male, greenish black; female, russet) reaching farther down and *abruptly contrasting with white of breast* and underparts.

RANGE.—Breeds entirely across the continent, from the Alaska Peninsula and Great Slave Lake south to New England, New York, Michigan, Minnesota, northern New Mexico, central Arizona, and central California. Winters mainly within the United States from southern British Columbia, the Great Lakes, and St. Lawrence Valley south to the Gulf States and northern Mexico.

DISTRIBUTION IN FLORIDA.—This species occurs in Florida as a winter visitant, sometimes in moderate numbers. Worthington reports a specimen observed May 30, 1906, on the beach at Amelia Island, which permitted a close approach and was thus fully identified. H. L. Stoddard found the birds fairly common along the coast from Wakulla Beach to Pinhook River, December 26 to 29, 1928. On December 21, 1917, S. R. Ingersoll observed three birds near New Smyrna; L. B. Hunt noted one, January 14, 1924, in Charlotte Harbor; and Pangburn (1919, p. 397) recorded three seen, March 25, 1918, in Pinellas County. H. L. Ferguson reports the capture of a specimen in Biscayne Bay, November 25, 1916, and Cory (1896a, p. 213) states that once he killed a specimen near the head of the Indian River.

HAUNTS AND HABITS.—In its summer home in the North, this Merganser dwells in fresh-water lakes and rivers; in the South, during the winter season, it is found chiefly in the salt-water bays and estuaries along the coast. Its flight is thus described by Bent (1923, pp. 9–10):

> The American merganser is a heavy-bodied bird and sometimes experiences considerable difficulty in rising from the water; if the circumstances are not favorable, it has to patter along the surface for a considerable distance . . . When well under way, the flight of this species is strong, swift, and direct; on its breeding grounds it usually flies low, along the courses of rivers or about the shores of lakes, seldom rising above the tree tops; but on its migrations it flies in small flocks high in the air with great velocity.

The birds are expert divers and attain great speed under water in pursuit of their finny prey. "Often a party of sheldrakes may be seen fishing together, driving the panic-stricken fish into the shallows or into some small pool where they may be more easily caught" (Bent).

Food.—Examination in the Biological Survey of 74 stomachs of this Merganser revealed its food to consist principally of fishes (80 per cent) and crustaceans, chiefly crawfishes (10 per cent), with about 3 per cent of insects and 3.5 per cent of other animal matter, mainly frogs. The fishes most frequently found in the stomachs were suckers (*Catostomus*), minnows (*Cyprinidae*), shiners (*Notropis*), trout (*Salmo*), sticklebacks, and yellow perch. Summing up his investigation of the bird's diet, McAtee says (Ms. report): "Warfare on the American Merganser at all times is not justifiable. On the other hand, the bird is not to be tolerated about fish ponds and hatcheries, nor in waters inhabited chiefly by valuable game or food fishes."

RED-BREASTED MERGANSER: *Mérgus serrâtor* Linnaeus

Other Names: Sawbill; Salt-water Sheldrake; Fish Duck; Hairyhead

Recognition Marks.—Smaller than the American Merganser (length, 20 to 25 inches; spread, 31 to 33 inches); head with a *long, two-pointed crest* in both sexes. *Adult male:* Head fuscous-black, with greenish reflections; a broad, white collar around the neck separates the color of the head from that of the back; fore back and scapulars blackish; hinder back and tail hair brown, the feathers edged with dull white; underparts white, with *a wash of dull pinkish cinnamon* on upper breast. *Female and immature male:* Upperparts mainly mouse gray; sides of head and neck dull pinkish cinnamon. (Plate 9.)

"At a distance in flight . . . males look black and white, females brown and white, both with white patches on wings, and white bellies; in flight their long, slim, outstretched necks, slim red bills and narrow heads distinguish them from Scoters, Goldeneyes or Old-squaws . . ." (Forbush, 1925, vol. 1, p. 182).

Range.—Throughout the northern parts of the Northern Hemisphere; in North America, it breeds from the Arctic coast south to the coast of Maine, northern New York, Michigan, Minnesota, southern Manitoba, and northern British Columbia. It winters on the Atlantic and Gulf coasts from Maine to Florida and Texas; on the Pacific coast from British Columbia to southern Lower California; and in the interior from the Great Lakes southward.

Distribution in Florida.—This is the commonest Merganser in the coastal waters of Florida in winter. First migrants from the North arrive in the State in October or early in November; a few were noted at St. Marks, October 10, 1918; at Fernandina, October 11, 1906, and November 8, 1905; at Pensacola, October 25, 1918; at the Chassahowitzka River, November 2, 1918 (7 flocks); and in Tampa Bay, November 11, 1914. Longstreet reports them common at Daytona Beach, where they sometimes remain until the last of May or first of June (June 4, 1925). A specimen was taken at New Smyrna, June 7, 1899, and Mrs. Byrd observed two near Bradenton on June 14, 1925. These late birds may in some cases be cripples, unable to fly.

This species is abundant in the bays near Pensacola in winter, from early in November to late in April. Weston counted 277 birds there on November 10, 1929. On April 24, 1926, I saw a flock of 35 or 40 flying over the surf at East Pass, Santa Rosa Island, and on April 30, 1926, observed a flock of 8 sitting on the beach on the inner side of Hurricane Island, St. Andrews Bay. The species was reported abundant in Tampa Bay in January, 1906, and moderately common in Sarasota Bay, January 27, 1919, and in Charlotte

Harbor in January, 1924. Chapman records about 20 birds seen on February 3, 1925, at Coconut Grove. J. T. Nichols (1918, p. 22) found the birds to be fairly common in the Bay of Florida in the vicinity of Sandy Key, April 1 to 16, 1917, and C. J. Pennock saw two at Cape Sable, March 27, 1922. On February 22, 1924, M. S. Crosby observed about 25 birds at Miami, and on February 16, 1926, about 30 at Tavernier. The United States National Museum collection contains a specimen taken at Cape Florida, November 16, 1857, and a skull picked up on the Tortugas in May, 1922.

HAUNTS AND HABITS.—The Red-breasted Merganser frequents the shallow bays, lagoons, and estuaries along the coast, and is occasionally seen in the surf. The birds occur usually in small companies, sometimes in flocks of 30 or 40. Where they are much hunted they become very wary. They fly in single file in straight lines, rather close to the water, and at such times may be identified by the long slender heads and pointed bills and the rather large white patches in the wings. Doctor Townsend (Bent, 1923, p. 19) describes the actions of the bird in the water, as follows:

> It is a rapid swimmer and perfectly at home in the roughest water. As a diver the bird is truly an expert, and it disappears under the water with the wings close to its sides, making use of its powerful feet alone, except on rare occasion when its wings are also brought into play. At times it leaps clear of the surface, describes a graceful arc and enters the water like a curved arrow, while at other times it disappears with scarcely a sign of effort. It often swims with its head and neck stretched out in front, as if it were skimming the water and straining it with its serrated bill for food. Again it advances with the head, all but the crest, below the surface apparently on the lookout for fish, and, at such times, it is constantly diving. At the moment of diving the crest is flattened down; when the birds swim before a strong wind the crests often blow up and over the head.

FOOD.—The food of this Merganser has been studied by W. L. McAtee, in the Biological Survey, who examined 99 stomachs, finding the contents to consist of fishes, 77 per cent; crustaceans (chiefly crawfishes), 16 per cent; other animals, principally mollusks and insects, 5 per cent. Thirty kinds of fishes were identified in the stomach contents, eleven of which were food fishes, though only five of these are of commercial value. The destruction of crawfishes must be considered a beneficial habit.

> All in all [says McAtee] the Red-breasted Merganser does not appear to have as destructive tendencies in relation to fish as the Goosander [*Mergus americanus*]. Nevertheless, the bird would not be a desirable visitor to fish ponds, or hatcheries, or other places where constructive efforts are being made to build up the fisheries.

AMERICAN VULTURES: FAMILY CATHARTIDAE

TURKEY VULTURE: *Cathártes áura septentrionâlis* Wied

OTHER NAME: Turkey Buzzard

RECOGNITION MARKS.—Nearly as large as the Bald Eagle (length, 26 to 32 inches; spread, 68 to 72 inches). *Head naked, crimson;* body color fuscous-black; recognized in flight by its very wide wing spread (greater than that of any hawk) and its habit of soaring. Distinguished in flight from the Black Vulture by its longer, rounded tail, and by the *grayish patches on the front part of the wings*, as seen from beneath. (Plate 28.)

RANGE.—Breeds from southern British Columbia, southern Saskatchewan, southern Manitoba, southwestern Ontario, southern New York, and New Jersey, south to southern Lower California and northern Mexico. Winters from California, Nebraska, and the Ohio Valley southward.

DISTRIBUTION IN FLORIDA.—Abundant in nearly all sections as far south as Key West.

HAUNTS AND HABITS.—So abundant and widely distributed is the Turkey Buzzard that one can scarcely spend half an hour out of doors anywhere in the South without seeing one or more of these great birds soaring in graceful circles high in air or coursing low over fields or marshes in search of food. No sooner has one of the birds alighted and begun to feed than others have observed this fact, and in a very short time numbers of them have gathered from every quarter to join in the feast. Their sight is very keen, and numerous instances in which these Vultures discovered comparatively fresh meat concealed from view have convinced me that they must be possessed, also, of a keen sense of smell. On one occasion I caught a Turkey Buzzard in a trap in the jungle at Royal Palm Hammock, the meat bait being nearly covered with dead leaves and entirely concealed from sight by the overarching trees. Buzzards are cowardly, and when a captive bird is approached, it hides its head and makes no attempt at resistance.

The breeding season begins in March, fresh eggs having been taken at Gainesville, March 10, 1899, and at Seven Oaks, March 27, 1907, and May 1, 1898. No nest is constructed, the two eggs being laid on the ground under a clump of bushes, at the base of a hollow tree, in or under a fallen log, or in a cave. If disturbed when on the eggs, the bird utters a wheezy, hissing sound, but at other times is silent.

FOOD.—These Vultures are valuable as destroyers of carrion, which would otherwise become offensive. Driving over the Tamiami Trail between Miami and Carnestown, December 4, 1928, I observed the birds in numbers, flying low over the roadway and alighting to feed on dead snakes and other animals that had been killed by automobiles.

They rarely attack living animals, but they have been known to pick out the eyes of a cow or horse mired in a bog (Wayne, 1910, p. 67) and are accused by cattlemen of sometimes killing young calves. These birds have frequently been accused of spreading hog cholera, but investigations by the State Board of Health indicate that the charge is unfounded, as "the virus of hog cholera is digested in the intestinal tract of buzzards and the droppings of buzzards fed on the flesh of hogs dead from cholera do not produce cholera when mixed in the feed of hogs." [1]

BLACK VULTURE: *Cŏragyps atrâtus atrâtus* (Meyer)

OTHER NAMES: **Black Buzzard; Carrion Crow**

RECOGNITION MARKS.—About the size of the Turkey Vulture (length, 24 to 27 inches; spread, 54 to 59 inches), but appearing smaller because of its shorter wings and tail; plumage black; *head naked, black.* Distinguished in flight from the Turkey Vulture by *shorter, square tail,* and by *grayish white patches at end of wings*—the shafts being white, and showing lighter than in the Turkey Vulture. (Plate 28.)

RANGE.—Resident in South and Central America and in North America north to Kansas, southern Illinois, southern Indiana, eastern Maryland, and southeastern Virginia. Casual in Ohio, Maine, Quebec, New Brunswick, and Nova Scotia.

DISTRIBUTION IN FLORIDA.—A common resident nearly throughout the State, becoming less numerous toward the southern end of the peninsula and said to be absent from the Florida Keys (Nichols, 1918, p. 23). Small numbers have been seen at Cape Sable and Royal Palm Hammock.

[1] 26th Ann. Rept. State Board of Health of Florida, 1914, p. 204 (1915).

HAUNTS AND HABITS.—The Black Vulture is heavier-bodied than the Turkey Vulture, has shorter wings and tail, and is less graceful in flight. It progresses usually by alternate periods of flapping and sailing. Its only note, according to Baynard, is "a guttural grunt or murmur, something like that made by hogs at feeding time." It is rather more gregarious than the Turkey Vulture, breeding often in colonies and frequently forming roosts of very considerable size. Baynard (1909b, p. 192) describes a roost in a cypress swamp where several thousand birds had gathered. These roosts are occupied more or less during the day as well as at night. The breeding season extends from January to July, but probably most clutches are laid in March and April. The sets number 2 or 3 eggs. Nicholson found 3 nests with eggs on the Kissimmee Prairie, January 18, 1927; Baynard records the earliest as found on February 10, 1909, and the latest, August 5. No nests are constructed, the eggs being laid usually in the dryer parts of cypress swamps or in palmetto clumps. A hollow log or the base of a hollow tree is said to be the favorite nesting site. According to Baynard, the period of incubation is 28 to 29 days.

FOOD.—These Vultures render considerable service as scavengers about the towns and cities of the South. Many of them live in rookeries of pelicans, cormorants, and herons, and besides picking up fish dropped by these birds, they are often quite destructive to their eggs and young. Baynard (1909b, p. 193) relates an instance in which the eggs and young in a colony of Yellow-crowned Night Herons were nearly all destroyed by Black Vultures. He says, also: "Hundreds of young pigs, lambs, etc., are annually devoured by them . . . I have had them come into my yard and catch young chickens."

HAWKS, EAGLES, AND KITES: FAMILY ACCIPITRIIDAE

WHITE-TAILED KITE: *Elânus leucúrus majúsculus* Bangs and Penard

OTHER NAME: White Hawk

RECOGNITION MARKS.—About the size of the Red-shouldered Hawk (length, 16 to 17 inches; spread, 39 to 42 inches; tail, 7 to 8 inches); much smaller than the Swallow-tailed Kite, with *square-tipped tail;* forehead, underparts, and tail white; back and wings pale neutral gray; front of wing with a *large black patch.* (Plates 24 and 27.)

RANGE.—Resident in Florida, Texas, Oklahoma, California, and northern Lower California; occurs rarely south to Guatemala.

DISTRIBUTION IN FLORIDA.—A rare and local resident nearly throughout peninsular Florida. The bird was first discovered in Florida by Titian R. Peale, who shot a specimen near St. Augustine (Bonaparte, 1828b, vol. 2, p. 24). Scott (1889a, p. 247) records the species from near Cape Romano and from Sanibel Island on the authority of J. W. Atkins. N. B. Moore found a pair breeding near Sarasota in 1872. Apparently Audubon, Maynard, Scott, and Ralph never observed the species in Florida, and the present writer has never seen one there. Longstreet noted two individuals at Daytona Beach, on April 1, 1924, and March 21, 1925, and Oscar Baynard reports having seen the species at Oldsmar in 1910. Specimens have been examined from Miakka (December, 1899); Fort Myers; Manatee (December 11, 1897); Lake Okeechobee (January 10, 1920); Pahokee (January 9, 1920); Blue Cypress Lake (April 15, 1901); and Cape Sable (June 10, 1896). The species seems to be on the verge of extinction in Florida.

HAUNTS AND HABITS.—Very little seems to be known of this bird's habits in Florida. A nest 28 feet up in an oak tree on the Kissimmee River, found by W. R. Collins, May 28, 1887, was composed of small sticks loosely put together, lined with grass, and contained 3 fresh eggs. On February 4, 1910, D. J. Nicholson noted a nest 11 feet up in a small oak standing in the middle of a dense patch of saw palmetto on the Kissimmee Prairie. This nest, made of oak twigs and lined with a small quantity of rabbit fur, measured 2 feet in diameter and 18 inches in height. No eggs had been laid. A nest observed by N. B. Moore, in April, 1872, near Sarasota, was placed 25 feet above the ground in a rather low, thick-topped pine; the first egg was laid on April 5; on April 15 the nest was empty and deserted. Mr. Moore describes the bird's note as "similar to that of the Osprey, but not so loud—a one-syllabled note terminating with a grating or guttural sound somewhat like that of some of the smaller herons" (Ms. notes).

Barlow (1897, p. 15) describes the habits of the western race of this Kite in California as follows:

> Their flight is even and graceful, often quite rapid but lacking the dash of the true Falcons. In hunting in the early morning hours both birds often go together, and they may frequently be seen hovering motionless in air, much after the manner of the Sparrow Hawk. The principal note consists of a low, plaintive, musical whistle, quite pleasing to the ear, and which is uttered both when the bird is at rest on some tree top and occasionally while it is on the wing in the vicinity of its nest.

FOOD.—This Kite is one of the wholly beneficial raptors. Its food, according to A. K. Fisher (1893, p. 23), consists of small snakes, lizards, frogs, field mice, grasshoppers, and beetles. Peale's specimen, taken in Florida, contained the remains of a cotton rat (*Sigmodon hispidus*).

SWALLOW-TAILED KITE: *Elanoides forficâtus forficâtus* (Linnaeus)

OTHER NAMES: **Snake Hawk; Forked-tailed Fish Hawk**

RECOGNITION MARKS.—Length, 20 to 25 inches; spread, 45 to 50 inches; tail, 12 to 15 inches, *forked for more than half its length;* wings very long, narrow, and pointed; head and underparts white; back, wings, and tail steel blue. (Plates 21 and 27.)

RANGE.—Breeds locally from northern Minnesota, southern Wisconsin, southern Indiana, and North Carolina south through eastern Mexico to Central America. Accidental north to Saskatchewan, Manitoba, Ontario, and New England. Winters mainly south of the United States.

DISTRIBUTION IN FLORIDA.—Breeds throughout the State, except on the Keys; rare in the northern parts, most abundant in central and southern Florida; a few are reported to winter in the extreme southern part (Harney River). First arrivals in spring were noted at St. Marks, March 10, 1918, and February 28, 1920; Panasoffkee Lake, last week in February, 1876; Whitfield, March 7, 1903; Orlando, March 8, 1909; and Pensacola, March 11, 1917. J. W. Atkins saw one at Key West, August 20, 1888, and E. J. Brown observed 8 in a migrating flock at Coconut Grove, August 29, 1929. Scott says they remain at Tarpon Springs until October. The species is reported to breed at St. Marks, Homosassa, San Mateo, Wekiva River, Osteen, Orlando, Fort Christmas, Lake Gentry, Lake Jessup, Miami, Flamingo, Okaloacoochee Slough, and in southern Collier County, east of Everglade.

HAUNTS AND HABITS.—The Swallow-tailed Kite seems to prefer a semiprairie country, or a region of open pine glades dotted with small cypress swamps. In such sections the birds hunt a good deal over the fresh-water marshes and the wet glades, flying at such times rather near the ground in their search for food. At other times, however, they ascend to a great height and perform swift and skillful evolutions in a most graceful manner. They are fond of soaring over lakes or streams, into which they frequently dip to drink while flying. They are on the wing the greater part of the day and often devour their prey as they sail leisurely along. Their ordinary note is a shrill, high-pitched whistle or squeal of three syllables.

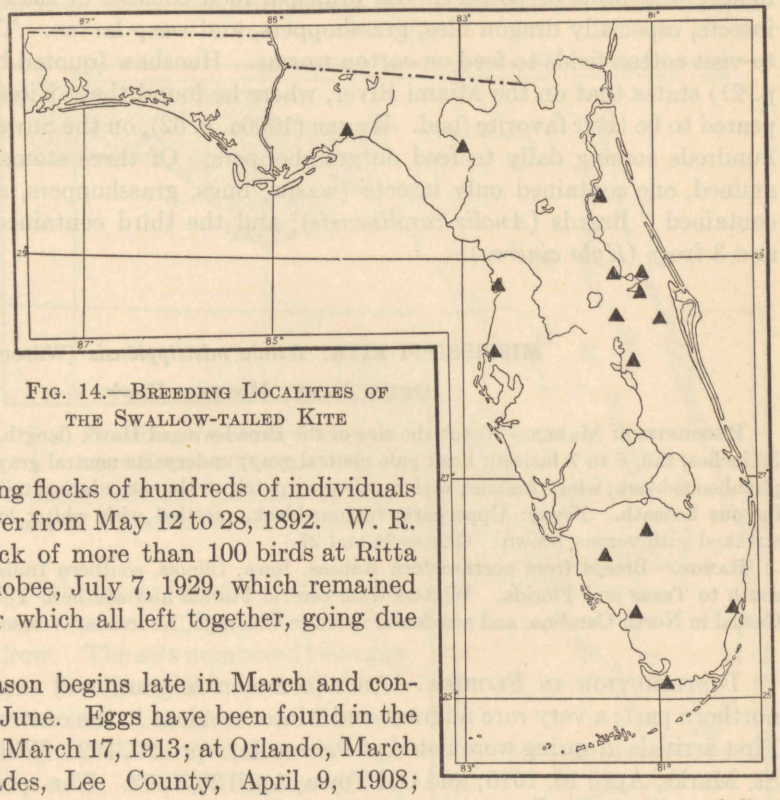


FIG. 14.—BREEDING LOCALITIES OF THE SWALLOW-TAILED KITE

These Kites are of a sociable disposition; two or more pairs often nest near together, and small companies are often seen at other seasons. Wayne (1906a, p. 62) speaks of seeing flocks of hundreds of individuals on the Suwannee River from May 12 to 28, 1892. W. R. Collins reports a flock of more than 100 birds at Ritta Island, Lake Okeechobee, July 7, 1929, which remained for three days, after which all left together, going due west.

The breeding season begins late in March and continues until early in June. Eggs have been found in the Big Cypress Swamp, March 17, 1913; at Orlando, March 25, 1909; Pine Glades, Lee County, April 9, 1908; southern Collier County, March 14 and May 5, 1928, and April 17, 1929; and San Mateo, April 11 and May 9, 1893. The nests are placed 50 to 100 feet from the ground, at or near the top of a slender tree, usually a pine or a cypress, and nearly always in or near a cypress swamp. They are composed of large twigs (chiefly cypress), Spanish moss, and pine needles, and lined with green moss and small twigs. The eggs are always two in number. (Plate 27.)

In April, 1927, D. J. Nicholson found these Kites numerous near Flamingo, in companies of 4 to 10, and was informed by Captain Roberts that they nest there in black mangrove trees. In Collier County, near Everglade, he noted the birds breeding in numbers late in April and early in May, chiefly in tall pines in rather open situations on the "pine islands" or in the more open spots in the cypress swamps. Concerning the birds' habits, he writes (D. J. Nicholson, 1928i, p. 159):

Nest building is done during the early morning hours, and only once did I see a bird carrying material in the afternoon. The gathering of material is done by breaking it off with the talons while flying, though later it may be shifted to the bill. No other kind of sticks were found in any of the nests but cypress, which are more brittle and easier broken off by these delicate birds, than pine limbs. Some of the nests are fairly deeply cupped, while others are so shallow it would seem the eggs would roll out of the nest.

FOOD.—This Kite is wholly beneficial in its food habits, and has never been known to molest wild birds or poultry. Its principal food consists of snakes, lizards, frogs, and insects, especially dragon flies, grasshoppers, and wasp larvae. The birds are reported to visit cotton fields to feed on cotton worms. Henshaw (quoted by A. K. Fisher, 1893, p. 21) states that on the Miami River, where he found these Kites common, snakes appeared to be their favorite food. Wayne (1906a, p. 62), on the Suwannee River, observed hundreds coming daily to feed on grasshoppers. Of three stomachs from Florida examined, one contained only insects (wasps, bugs, grasshoppers, and beetles); another contained 7 lizards (*Anolis carolinensis*); and the third contained 9 hairy caterpillars and 3 frogs (*Hyla cinerea*).

MISSISSIPPI KITE: *Ictínia misisippiénsis* (Wilson)

OTHER NAME: **Mosquito Hawk**

RECOGNITION MARKS.—About the size of the Broad-winged Hawk (length, 14 to 15 inches; spread, 36 inches; tail, 6 to 7 inches); head pale neutral gray; underparts neutral gray; back and wing coverts plumbeous-black; wings fuscous, with a pale gray patch on the secondaries; tail plumbeous-black above, fuscous beneath. *Young:* Upperparts fuscous-black, mottled with white; lower parts buff, broadly streaked with verona brown. (Plates 24 and 27.)

RANGE.—Breeds from northeastern Kansas, Iowa, Illinois, southern Indiana, and South Carolina south to Texas and Florida. Winters from central Florida and southern Texas south to Guatemala. Casual in North Carolina, and accidental north to Colorado, Nebraska, Wisconsin, and Pennsylvania.

DISTRIBUTION IN FLORIDA.—An uncommon migrant and summer resident in the northern part; a very rare migrant and winter resident in the central and southern parts. First arrivals in spring were noted at Pensacola, April 20, 1924; Whitfield, April 15, 1903; St. Marks, April 16, 1916; and Old Town, April 20, 1892. The species is reported as an uncommon breeder at Pensacola, Whitfield, St. Marks, Tallahassee, Lake Iamonia, and Waukeenah. G. H. Muldoon (1877, p. 36) records a nest and eggs found on the Caloosahatchee River; if correctly identified, this is the most southern breeding record. Scott noted three birds at Panasoffkee Lake during January and February, 1876. Wayne (1906a, p. 62) mentions seeing hundreds of these Kites, daily, from May 12 to 28, 1892, on the Suwannee River. The species was reported at Gainesville, April 29, 1887; Fort Kissimmee, February 23, 1907; and Royal Palm Hammock, March 4, 1917. On May 13, 1926, I saw two birds in the Aucilla River swamps. F. M. Weston observed six near Pensacola, May 3, 1931. Philip A. Du Mont observed one, January 29, 1929, on the Tamiami Trail, about 60 miles west of Miami. J. H. Batty took a specimen at "Palm Hammock," Dade County, between April 25 and May 10, 1885—originally recorded as *Ictinia plumbea* (see Cahoon, 1890, p. 35, and Chapman, 1891a, p. 94).

HAUNTS AND HABITS.—The Mississippi Kite is a very unsuspicious bird and is easily approached, which may have led to its depletion in most settled localities. The birds live in wooded regions, often around the borders of heavy bottomland timber, placing their nests in the tops of tall oaks or pines. Though less graceful in the air than the Swallow-tailed Kite, they are swift and strong flyers, often ascending to a great height and suddenly pitching downward with great swiftness, quickly checking their descent when near the earth and rising again with the same impetus to at least half their former elevation. I have seen them turn completely over in the air like a tumbler pigeon. H. L. Stoddard says: "The Kite, while perched, sits very erect with the head well back, and the beak almost buried in the feathers of the neck, suggesting a small parrot."

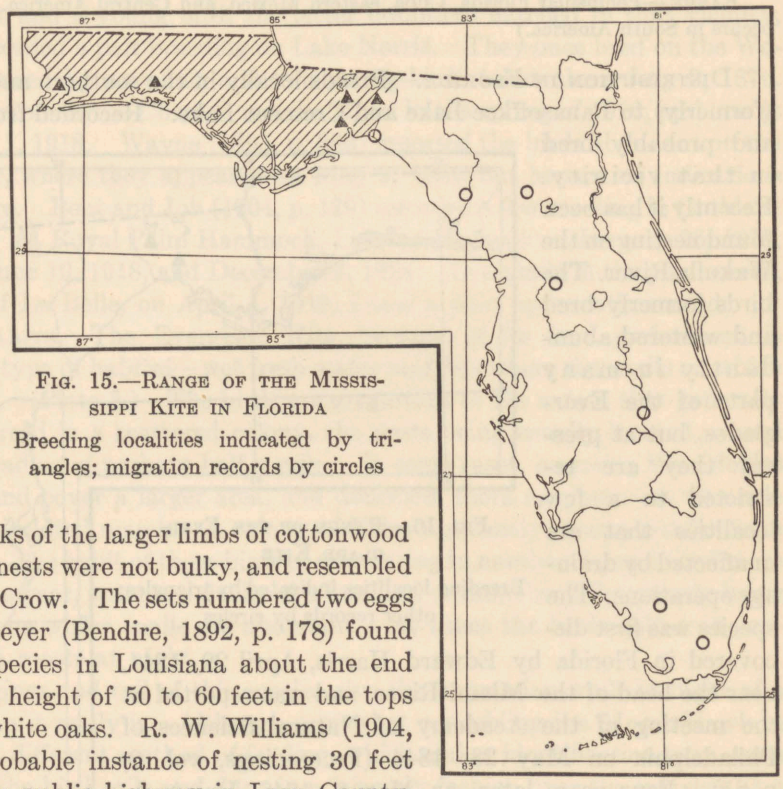


FIG. 15.—RANGE OF THE MISSISSIPPI KITE IN FLORIDA

Breeding localities indicated by triangles; migration records by circles

Goss (1891, p. 344) describes a breeding colony of these Kites in Kansas. Seven nests were found, from 10 to 100 rods apart, 25 to 50 feet above the ground in the forks of the larger limbs of cottonwood and elm trees. The nests were not bulky, and resembled those of the common Crow. The sets numbered two eggs each. George E. Beyer (Bendire, 1892, p. 178) found two nests of this species in Louisiana about the end of May, placed at a height of 50 to 60 feet in the tops of loblolly pines or white oaks. R. W. Williams (1904, p. 454) records a probable instance of nesting 30 feet up in a pine, near a public highway in Leon County.

FOOD.—This Kite, like the others of its group, is wholly beneficial, since it feeds almost exclusively on insects. A. K. Fisher (1893, p. 24) lists in the contents of stomachs examined: Grasshoppers, beetles, katydids, and crickets. He also mentions lizards, small snakes, and frogs as part of the bird's diet. Wayne states that while on the Suwannee River he observed hundreds of these Kites come daily to feed on grasshoppers. Stomachs of two birds taken at Whitfield contained the remains of bees and one beetle; one specimen from Redbay, Walton County, had the stomach full of insect remains; several stomachs of birds from other States contained cicadas, grasshoppers, and dragon flies.

EVERGLADE KITE: *Rostrhámus sociábilis plúmbeus* Ridgway

OTHER NAMES: **Snail Hawk; Hook-billed Hawk**

RECOGNITION MARKS.—About the size of the Marsh Hawk (length, 16 to 18 inches; spread, about 44 inches); *bill long and slender, strongly hooked. Adult male:* Head blackish mouse gray; fore back and wing coverts deep mouse gray, with a plumbeous wash; rest of body, wings, and tail fuscous-black; *a large white patch across base of tail* (conspicuous in flight). *Adult female:* Upperparts mainly fuscous, the head marked with white; underparts pinkish buff, broadly streaked with fuscous. *Immature* (both sexes): Similar to the adult female, but feathers of upper parts edged with cinnamon or mikado brown. (Plates 20 and 27.)

RANGE.—Peninsular Florida, Cuba, eastern Mexico, and Central America. (A closely related form occurs in South America.)

DISTRIBUTION IN FLORIDA.—Breeds locally in the southern and central parts, north (formerly) to Panasoffkee Lake and Crescent Lake. Recorded from the Wacissa River and probably bred in that vicinity. Recently it has been found nesting on the Wakulla River. The birds formerly bred and wintered abundantly in many parts of the Everglades, but at present they are restricted to a few localities that are unaffected by drainage operations. The species was first discovered in Florida by Edward Harris, April 29, 1844, near the head of the Miami River, and was reported at the meeting of the Academy of Natural Sciences of Philadelphia on May 28, 1844 (Proceedings, vol. 2, p. 65). Four years later, on May 6, 1848, Dr. A. L. Heermann collected four additional specimens in the same locality. In February and March, 1871, also in the same region, C. J. Maynard and H. W. Henshaw took a number of specimens and found several nests, as related in interesting detail by Maynard in Birds of Eastern North America (pp. 285–289).

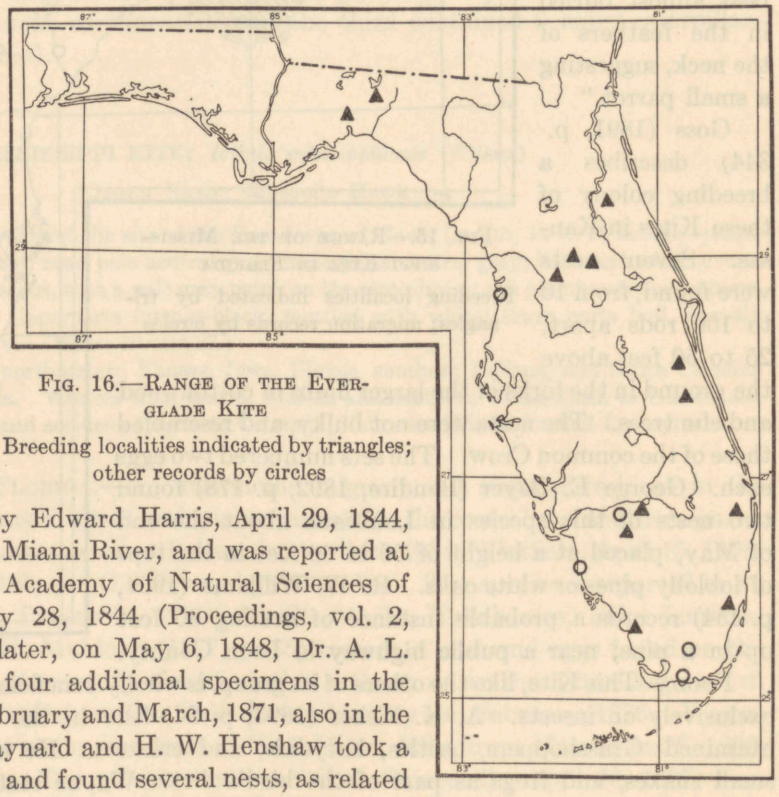


FIG. 16.—RANGE OF THE EVERGLADE KITE

Breeding localities indicated by triangles; other records by circles

A favorite breeding ground was in the Loxahatchee Marsh on the eastern side of the Everglades, in Palm Beach County, but a search there in the spring of 1923 failed to reveal a single bird, although in 1921 the birds were reported to be breeding abundantly. Their fluctuations are due primarily to the abundance or scarcity of their favorite food, the large everglade snails, which in turn are dependent for their existence on a permanent

body of shallow water. Another section formerly occupied in numbers by the Kites was the vast saw-grass marshes around Lake Hicpochee and the southern shore of Lake Okeechobee, but drainage operations have driven them almost completely from this region.

After much searching for the birds in their old haunts, I found them in 1923 breeding in considerable numbers in various parts of the big marshes near the headwaters of the St. Johns River in Brevard and St. Lucie Counties. They were said to have increased in this region since the draining of the Everglades. On a visit to Panasoffkee Lake in June, 1925, I failed to find any Kites, where Scott (1881, p. 16) had reported them abundant in February and March, 1876. In the Emeralda Marsh, near Lake Yale, May 9, 1925, I saw an adult and a young bird, the latter doubtless hatched in that vicinity, and B. M. Kinser recorded a pair breeding on Lake Norris. They once bred on the Wekiva River, as evidenced by an adult and two young birds taken there July 2, 1876. A specimen was collected on the Chassahowitzka River in the spring of 1918, and one at Naples about March 1, 1918. Wayne (1895, p. 366) reported the birds abundant on the upper Wacissa River, where they appeared on May 9, 1894, but he saw no indications of their breeding there. Bent and Job (1904, p. 129) recorded a few roosting in Cuthbert Lake in May, 1903. At Royal Palm Hammock, I observed a pair on January 26, 1918, and single birds on June 19, 1918, and December 2, 1928. In a glade in the pine woods, 13 miles southeast of La Belle, on April 4, 1919, I saw a pair, apparently mated.

HAUNTS AND HABITS.—The Everglade Kite, because of its food preferences, is restricted to a single type of habitat—wet fresh-water marshes where the snails on which it feeds are plentiful. (Plate 5.) The birds are gregarious to the extent that generally a number of pairs breed in a scattered colony, the nests being usually located several rods apart within a radius of perhaps half a mile. In some cases, however, the colonies are more scattered and cover a larger area, and doubtless there are instances of single pairs breeding in an isolated marsh. A colony of Kites frequently locates not far from a rookery of herons. The habit of these birds of associating in numbers is continued more or less throughout the year, scattered flocks of a hundred or more birds frequently being found in a limited area where snails are abundant. At times the birds gather in considerable numbers in roosts at night.

The big, broad wings and tail of this species give the impression while in flight of a bird much larger than it really is. Although somewhat resembling the Marsh Hawk in flight, the Kite has a different method of feeding, which makes identification easy, even at long distances. The bird sails and flaps in a leisurely fashion over the marshes at a height of 6 to 15 feet, its head inclined downward, scanning the grass keenly. When a snail is detected, the bird either drops on it instantly or makes a quick turn to gain the right position for a strike. Upon seizing a snail in its sharp talons, it carries it to a nearby bush or a little mound, where the mollusk is extracted from its shell with the sharp, hooked bill of the bird and swallowed in pieces about a half or three-quarters of an inch in length. The snails are sometimes shifted from the foot to the bill and occasionally are eaten by the Kite while flying. The shells are unbroken, as a rule, although occasionally one is seen with a puncture in the side. Piles of the discarded shells may be found around nearly every bush in a region in which the Kites are numerous and frequently a score or more are seen on an old nest.

The feeding birds generally fly in a fairly straight course, occasionally making turns to one side or the other. At such times, and especially when they are checking their course to drop on a snail, the broadly expanded tail is brought into play in a peculiar fashion, and often turned at such an angle that it serves as a rudder. It is this habit, together with the conspicuous white patch in the tail, that makes recognition easy. At times the birds soar in spirals until almost lost to sight.

Dr. C. W. Townsend (1927, p. 550), describing the courtship actions of these Kites, says:

> Presently one departed and the other two circled about, darting at each other from time to time. Occasionally one would turn on its side and stretch out its legs as if to grapple. After playing in this way for a short time, one of the Kites circled upwards and, reaching a considerable elevation, dove swiftly downwards with wings curved back, and then turned completely over, end to end. This maneuver was repeated several times, the bird crying out at the same moment in a bleating fashion very much like a sheep.

The Kites are frequently attacked by Red-winged Blackbirds or Kingbirds, at which times they try to escape their tormentors by making quick swoops to avoid their attacks, uttering a low chuckling note similar to the rattling notes of some of the hylas. The birds are not shy, and often will fly at a low altitude over a person, especially if he remains quiet and partly hidden. In defense of their nests they show little or no fear, but will fly directly toward an intruder, uttering a weak, cackling note, repeated many times.

The nests are usually placed 3 to 8 feet above the water in dead myrtle or willow bushes in the marsh. They are often quite conspicuous, but frequently are entirely concealed from view by the tall saw grass which nearly always surrounds the nest site. (Plate 26.) Occasionally one may be found fastened only to the growing stalks of saw grass, and in the Loxahatchee Marsh, where small cypress trees draped with Spanish moss grow in abundance, the nests are usually located 8 or 10 feet above the water in those trees. They are about 12 to 15 inches in diameter, rather flat, and composed of dead twigs loosely put together, sometimes mixed with Spanish moss, and lined with a few green leaves. A nest found by H. L. Stoddard near Wakulla Springs was placed about 30 feet above the water on a horizontal limb of a large cypress tree on a small island in the river—a most unusual situation. (Plate 26.) This nest was "a well built structure of small, tough twigs, rather deep and well formed in the center; a few sprigs of green leaves were in the nest." The eggs were 6 in number and nearly fresh; two of them were much more heavily washed with brown than the other four. Apparently this record set was all from one female, as this was the only pair found in the vicinity. J. F. Menge (quoted by Bendire, 1892, p. 181) asserts that the male constructs the nest while the female sits near by and watches him work. This feminine attitude is unusual among the hawks, however, and the habit has not been confirmed by other observers.

The breeding season is quite extended and varies in different years. Nesting may begin as early as January, but generally extends from late in February to the middle of June. Henry Redding reports observing about 30 nests in the St. Johns River marshes between February 14 and 19, 1927, some of which contained fully fledged young, and others fresh eggs. On April 27, 1925, in the marshes near Fellsmere, D. J. Nicholson (1926a, p. 62) found about 12 pairs of the birds breeding, some just building and others

with incubated eggs, and one family of 3 already on the wing, being fed by their parents. In the Loxahatchee Marsh, near West Palm Beach, two sets of fresh eggs were noted on June 16, 1913. The eggs usually number 2 or 3, sometimes 4 or 5. The young birds are attractive, gentle little creatures, with soft brown eyes and rich ochraceous-brown plumage. When nearly grown they stand up in the nest and eye an intruder fearlessly, with their tongues sticking out at one side of the mouth. The young remain in the company of the adults and are fed by them for a considerable period after leaving the nest. They resemble the female in color during the first season, but a bird of the year taken on May 11 had already acquired the red eyes of the adult male.

FOOD.—All observers agree in stating that the Everglade Kite feeds exclusively on the large fresh-water snail so common in the marshes and watercourses of Florida. Specimens collected there have been identified as *Ampullaria caliginosa* Reeve. The birds are entirely harmless to man's interests, and should receive the fullest protection.

EASTERN GOSHAWK: *Ástur atricapíllus atricapíllus* (Wilson)

OTHER NAME: **Blue Hen Hawk**

RECOGNITION MARKS.—Larger than the Marsh Hawk (length, 20 to 26 inches; spread, 40 to 47 inches; tail, 9 to 13 inches). *Adult:* Upperparts bluish slate, the head black; a blackish stripe behind the eye; underparts white, finely vermiculated with neutral gray, the feathers of throat and breast with dark median streaks; lining of wings like breast, the primaries *without dark crossbars*. *Immature:* Similar to immature Cooper's Hawk, but larger. (Plate 27.)

RANGE.—Breeds from northwestern Alaska, northwestern Mackenzie, and northern Quebec south to Michigan, northern New York, and New England, and in the mountains south to Pennsylvania and northern Maryland. Winters from Alaska and southern Canada south to northern Mexico, Oklahoma, Kentucky, and Virginia; casually to northern Florida.

DISTRIBUTION IN FLORIDA.—Of casual occurrence in winter; there are but three records of the Goshawk in Florida, one of which is indefinite. Cory, in his Birds of Florida (1896, p. 12), ascribes this species to the State. In a letter dated February 5, 1921, Mr. Cory makes the following statement regarding this record: "Bought a skin of Greenleaf and Crosby at Jacksonville, about 1890, claimed to have been shot near Tallahassee." The second record is based on a specimen, now in the Biological Survey collection, shot near Lake Iamonia, Leon County, December 1, 1926, by H. P. Whitney, and prepared by Herbert L. Stoddard. A third record was unearthed by W. G. Fargo at Maximo Point, on Pinellas Peninsula, which constitutes the most southerly record for the species. The bird in question was killed on or about November 15, 1927, by Harold P. Bennett as it was devouring one of his chickens, and the body was buried. Mr. Fargo dug up the remains and sent the sternum and some of the limb bones to the Biological Survey, and they were identified by Dr. Alexander Wetmore as undoubtedly those of a Goshawk. (Fargo, 1928b, p. 45.)

HAUNTS AND HABITS.—The Goshawk inhabits wooded districts, and during its winter migrations is often found along watercourses. In its flight and method of hunting it resembles Cooper's Hawk, but its larger size enables it to kill and carry off larger game. It is considered one of the most daring of all the hawks, often seizing a fowl from the poultry yard without regard to the presence of man.

FOOD.—This species feeds largely on grouse, ptarmigan, ducks, poultry, and smaller birds, and to a lesser extent on rabbits, squirrels, other small mammals, and a few insects. This is one of the few hawks classed as decidedly injurious to man's interests, but its scarcity in the Southern States makes its damage there negligible.

SHARP-SHINNED HAWK: *Accipiter velox velox* (Wilson)

OTHER NAME: **Little Blue Darter**

RECOGNITION MARKS.—Larger than the Sparrow Hawk (length, 10 to 14 inches; spread, 20 to 27 inches; tail, 5 to 8 inches) with broader wings and tail; tail *square-ended*, longer than that of either the Sparrow Hawk or the Pigeon Hawk, its under surface with 5 or 6 fuscous crossbars, which are *narrower* than the intervening grayish white spaces. *Adult:* Upperparts neutral gray, shading to blackish on head; underparts *barred crosswise* with sayal brown (light brown) and white, the throat narrowly streaked with fuscous. *Immature:* Upperparts fuscous, edged with cinnamon; underparts white, streaked *lengthwise* with snuff brown. (Plate 27.)

RANGE.—Breeds from northwestern Alaska, northwestern Mackenzie, central Quebec, and Newfoundland south nearly to the southern border of the United States (central California, Arizona, New Mexico, Texas, Alabama, and northern Florida). Winters from southern British Columbia, Montana, Minnesota, southern Ontario, Ohio, and New England south to Panama.

DISTRIBUTION IN FLORIDA.—An uncommon winter resident, formerly more numerous. Probably breeds locally in small numbers, although there seems to be no definite record of a nest or eggs. Pennock, at St. Marks, records it as a resident, and notes single birds seen on June 9, 1913, and May 10, 1917. Williams says it is resident in Leon County, but gives no nesting records. Ralph (in Bendire, 1892, p. 186) reported it common in winter in St. John and Putnam Counties, and was told that a few remained to breed. Baynard (1913a, p. 244) states that the bird formerly bred in great numbers in Alachua County; and Bent and Copeland (1927, p. 380) say it is reported to nest in Hernando County. Migrating individuals have been noted on the Tortugas, April 13, 1890, May 1 to 5, 1913, and April 25, 27, and 28, 1914; Key West, March 5, 1890; and at Cape Florida, November 10, 1857. Wintering birds are recorded from Kissimmee (January 27, 1917); Fort Bassenger (March 28, 1923); Punta Gorda (February 3, 1919); Anastasia Island (February 25, 1917); St. Vincent Island (October 31 and November 8, 1910); Coconut Grove (January 10 and 23, 1926); Royal Palm Hammock (January 15 and 18, 1918); Cape Sable (March 28, 1924); and Tavernier (February 17, 1926).

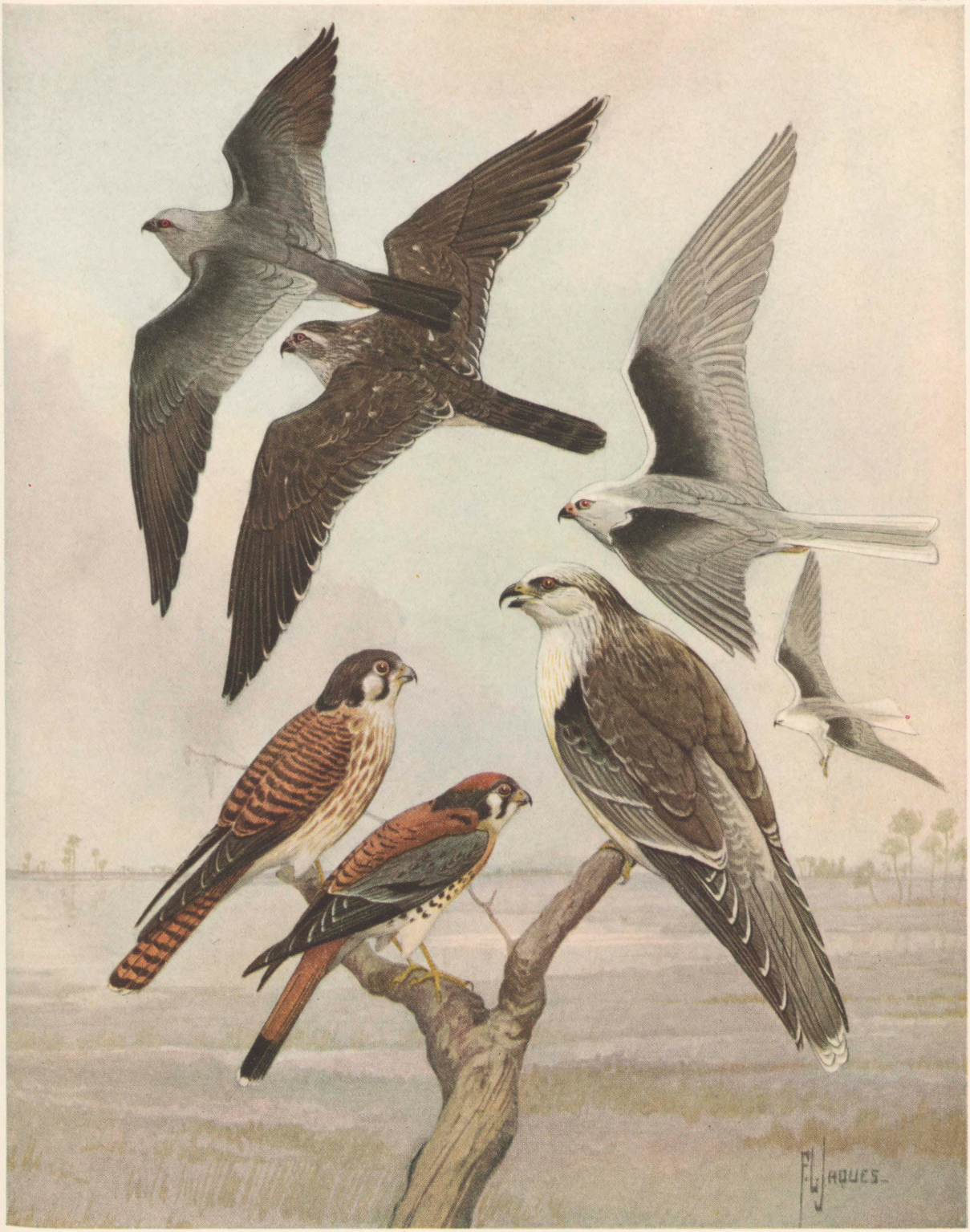
HAUNTS AND HABITS.—The Sharp-shin frequents brushy woodlands, and in the breeding season is partial to evergreen trees. The birds hunt their prey mainly by skulking through thick timber and along hedges, making a quick dash for their unsuspecting victims, usually a small bird. Their nests are placed 20 to 40 feet above the ground in the branches of small trees, usually an evergreen, next to the trunk. They are large for the size of the bird, often 25 to 30 inches in diameter and 6 or 8 inches thick, and are composed of twigs and the inner bark of trees. The birds are bold in defense of their nests, flying savagely at an intruder and striking at him every few seconds, uttering a shrill alarm note like the *kak-kak* of the Flicker. The usual number of eggs laid by the Sharp-shin is 4 or 5 (rarely as many as 7). They are laid late in May in southern New England and late in April in North Carolina.

PLATE 24

EXPLANATION OF PLATE 24

KITES AND FALCONS

The two upper figures are Mississippi Kites, adult (left) and immature (right); at the right are three White-tailed Kites, an immature bird perched and two adults in flight; at the lower left is a pair of Sparrow Hawks, female (upper) and male (lower).


F. J. HAQUES.

FOOD.—This species, with its larger relative, Cooper's Hawk, is largely responsible for the losses from predaceous birds that poultry raisers suffer in their flocks. The natural food of the Sharp-shin is the smaller wild birds—sparrows, warblers, thrushes, and occasionally a bird as large as the Flicker, Quail, or Mourning Dove. At times, however, young chickens prove very attractive to these little hawks, and when one has found the way to the poultry yard, it is likely to repeat its visits until the entire flock is gone. Mice, grasshoppers, and beetles are occasionally eaten.

COOPER'S HAWK: *Accipiter coöperi* (Bonaparte)

OTHER NAMES: **Big Blue Darter; Chicken Hawk**

RECOGNITION MARKS.—About the size of the Marsh Hawk (length, 14 to 20 inches; spread, 27 to 36 inches; tail, 7 to 10.5 inches); wings shorter; distinguished from the Red-shouldered Hawk by its shorter wings and *long, rudder-like tail;* a close counterpart in color of the Sharp-shin, but larger and the *tail slightly rounded.* (Plate 27.)

RANGE.—Breeds from southern British Columbia, central Alberta, southern Quebec, and Prince Edward Island south to the southern border of the United States and northern Mexico. Winters from Washington, Colorado, Nebraska, southern Michigan, southern Ontario, and southern Maine south to Costa Rica.

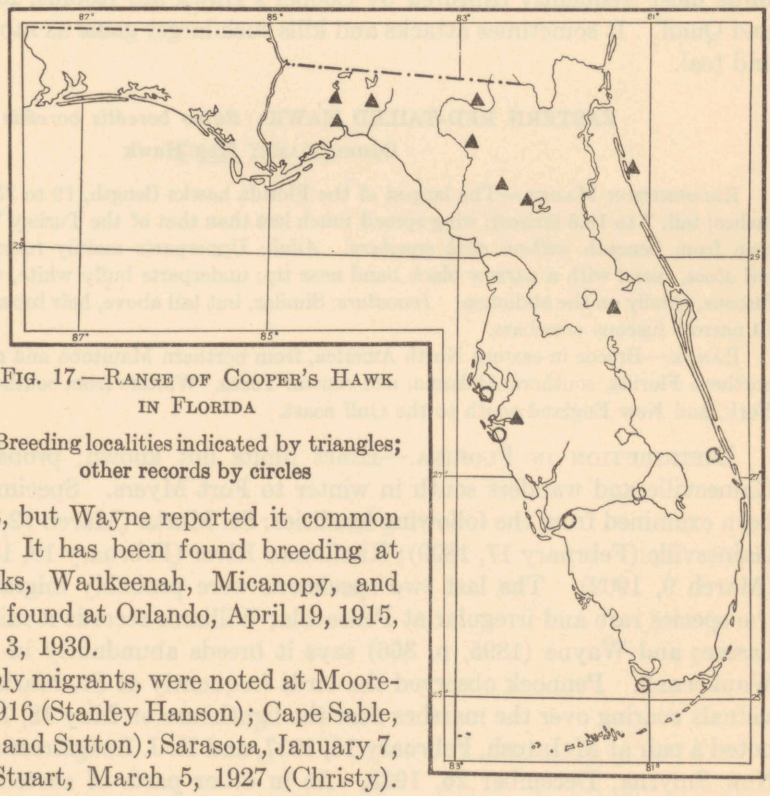


FIG. 17.—RANGE OF COOPER'S HAWK IN FLORIDA

Breeding localities indicated by triangles; other records by circles

DISTRIBUTION IN FLORIDA.—Cooper's Hawk is a rather uncommon resident, apparently most numerous in the northern half of the State. Scott (1889a, p. 247) considered it rare even in his day on the Gulf coast, but Wayne reported it common at Branford in 1892. It has been found breeding at Tallahassee, St. Marks, Waukeenah, Micanopy, and Manatee. Eggs were found at Orlando, April 19, 1915, and April 4 and May 3, 1930.

Single birds, possibly migrants, were noted at Moorehaven, September 9, 1916 (Stanley Hanson); Cape Sable, March 13, 1924 (Holt and Sutton); Sarasota, January 7, 1926 (Crosby); and Stuart, March 5, 1927 (Christy). Bent reports two at Gulfport and on the Hillsborough River, in February, 1925. W. Howard Ball saw one near Genoa, June 1, 1929.

HAUNTS AND HABITS.—Cooper's Hawk inhabits timbered districts interspersed with fields and meadows. Its flight is swift and irregular, especially when it is hunting, and

once the hawk has sighted its prey, it pursues it through the woods or thickets with amazing skill and dexterity. The nests are placed in the crotch of a tree or on a limb close to the trunk, at heights ranging from 16 to 50 feet. Either a deciduous tree or an evergreen may be chosen. Not infrequently the birds select an old nest of a Crow or of a larger hawk, this being remodeled and used. A nest found by D. J. Nicholson near Gainesville, May 25, 1930, was 40 feet up in an oak in a grove; it was flimsily constructed of dead oak twigs and lined with a quantity of green pine needles and green oak leaves. A nest observed on Anastasia Island, May 4, 1930, was placed about 16 feet from the ground in a small oak tree, and contained 3 eggs. It was about 2 feet high, poorly constructed of small sticks, and lined with small pieces of pine bark (Hallman, 1931, p. 50). In Florida, the eggs usually number 3 or 4.

Food.—Cooper's Hawk is preeminently a "chicken hawk," and is the only American species that is seriously destructive to poultry. Of 133 stomachs of this Hawk examined in the Biological Survey, 34 contained poultry or game birds; 52, other birds; 11, mammals; 3, lizards; 2, insects; and 1, a frog (A. K. Fisher, 1893, p. 43). Among the wild birds most frequently captured by Cooper's Hawk are Robins, Meadowlarks, Flickers, and Quail. It sometimes attacks and kills such larger game as rabbits, squirrels, grouse, and teal.

EASTERN RED-TAILED HAWK: *Búteo boreâlis boreâlis* (Gmelin)

Other Name: **Hen Hawk**

Recognition Marks.—The largest of the Florida hawks (length, 19 to 25 inches; spread, 46 to 56 inches; tail, 7 to 10.5 inches); wing spread much less than that of the Turkey Vulture; wings and tail as seen from beneath *without dark crossbars*. *Adult:* Upperparts mainly fuscous, shaded with tawny; *tail above, russet* with a narrow black band near tip; underparts buffy white, moderately streaked with fuscous, chiefly on the abdomen. *Immature:* Similar, but tail above, hair brown (dark drab) with about 10 narrow fuscous crossbars.

Range.—Breeds in eastern North America, from northern Manitoba and northern Ontario south to northern Florida, southern Alabama, and central Texas. Winters from southern Kansas, Illinois, New York, and New England south to the Gulf coast.

Distribution in Florida.—Exact limits not known; probably breeds south to Gainesville and wanders south in winter to Fort Myers. Specimens of this race have been examined from the following localities: St. Marks (March 12, 1914); Aucilla River; Gainesville (February 17, 1890); Kissimmee River (February 19, 1893); and Fort Myers (March 9, 1902). The last two specimens were probably migrants. Weston reports the species rare and irregular at Pensacola; Williams records it fairly common at Tallahassee; and Wayne (1895, p. 366) says it breeds abundantly in the hill country near Waukeenah. Pennock observed the birds frequently at St. Marks, and we saw 4 individuals soaring over the marshes near the lighthouse on May 18, 1926. Francis Harper noted a pair at McIntosh, February 16, 1917, and R. J. Longstreet saw several birds near New Smyrna, December 26, 1923. As in other parts of eastern United States, this species is rapidly becoming scarce.

Haunts and Habits.—The Red-tail is one of the wilder hawks and will not tolerate the near approach of man or live near his habitations. Their nests are placed high up in the forks of a tall tree, and the birds do most of their hunting over open country.

PLATE 25

EXPLANATION OF PLATE 25

THE LARGER HAWKS

The upper figures at the right are an adult (left) and immature Insular Red-shouldered Hawk; the middle figures are an adult (left) and immature Florida Red-tailed Hawk; the lower figures are the two phases of the Short-tailed Hawk.

F. L. ROUES

Their flight, though steady and powerful, is not swift, and most of their prey is picked up from the ground. They delight to ascend to great heights and spend hours in soaring far above the earth. C. J. Pennock mentions an instance, however, in which he observed a Red-tail catching insects over a raging marsh fire. When their nests are approached by man, the soaring birds often emit a high-pitched squeal. S. A. Grimes (1931, p. 47) records a nest of this species found in a small swamp near Jacksonville, April 8, 1930; it was placed 71 feet from the ground in a cypress tree, and contained two young less than a week old.

Food.—Studies of the food habits of the Red-tail by the Biological Survey have shown that the bulk of its food consists of meadow mice, while poultry and game birds constitute not more than 10 per cent of the total. Of 562 stomachs examined by Doctor Fisher, 54 contained poultry or game birds; 51, other birds; 278, mice; 131, other mammals; 37, batrachians and reptiles; 47, insects; 8, crawfishes; 13, offal; and 89 were empty. Among the mammals other than mice captured by the Red-tail are squirrels, chipmunks, ground squirrels, cotton rats, rabbits, and pocket gophers. The wild birds taken include crows, meadowlarks, grackles, quail, grouse, and various species of sparrows.

FLORIDA RED-TAILED HAWK: *Bûteo boreâlis umbrînus* Bangs

Recognition Marks.—Similar to the northern race, but underparts more heavily marked with dark fuscous, this color extending even to the neck and throat. (Plates 25 and 28.)

Range.—Southern and central Florida, Cuba, and the Isle of Pines.

Distribution in Florida.—Southern Florida, north at least to Tampa Bay and the Kissimmee Prairie, possibly to San Mateo and Cedar Keys. Specimens have been examined from Miakka (type, April, 1888); Pine Island, southern Everglades (May 17, 1911); Fort Myers (March 9, 1902); Fort Bassenger (February 25, 1896); Malabar; Kissimmee River (February 19, 1893); Seven Oaks (near Safety Harbor, 4 specimens, winter); and Lukens (December 28, 1907). A. C. Bent took a number of specimens in Collier County in February, 1930. Scott (1889, p. 247) reported this species as a rare resident at Tarpon Springs. Doctor Ralph (quoted by Bendire, 1892, p. 217) records the species (under the name *Buteo b. harlani*) as fairly common in St. John and Putnam Counties; he collected eggs near San Mateo, March 4, 1892. These hawks still nest in moderate numbers on the Kissimmee Prairie, where eggs were collected by D. J. Nicholson, February 24 and March 16, 1926, and February 16, 1928. Nicholson states that he has found the birds even more numerous in Brevard County, in the salt swales between the St. Johns River and the high pinelands to the eastward, and on Merritt Island. Near Carnestown, April 1 and 2, 1928, he found two nests containing incubated eggs and newly hatched young. Dark birds, believed to be of this race, were seen on the Southport Canal, Osceola County, January 30, 1917 (F. Harper); on the St. Johns marshes, south of Deer Park, May 1, 1925; at Deep Lake, March 22, 1919; at Royal Palm Hammock, January 26 and 30, 1918; and at Cape Sable, February 18, 1918.

Haunts and Habits.—This race of the Red-tail is more of a prairie dweller than its northern relative. Their nests are placed in lone pines or cabbage palms or in the little oak hammocks that dot the prairie, sometimes as low as 15 feet from the ground or

again as high as 78 feet. They are about 2½ feet in diameter, and are constructed of small sticks, Spanish moss, green oak leaves, and cabbage-palm blossoms. On the Kissimmee Prairie the eggs, two in number, are laid as early as February 10.

FLORIDA RED-SHOULDERED HAWK: *Búteo lineâtus âlleni* Ridgway

OTHER NAME: Hen Hawk

RECOGNITION MARKS.—Much smaller than the Red-tail (length, 17 to 19 inches; tail, about 7.75 inches; folded wing, 11 to 12.75 inches). *Adult:* A russet or tawny patch on shoulder of wing; upper and under surface of *wings barred with white and fuscous;* tail fuscous-black above, mouse gray beneath, with about 5 *narrow white crossbars;* underparts pinkish buff, more or less heavily barred with cinnamon or light brown (sayal brown). *Immature:* Underparts pale buff, streaked and blotched with fuscous; upperparts and wings fuscous, without prominent white markings. (Plate 28.)

RANGE.—South Atlantic and Gulf States north to Oklahoma, Arkansas, northern Alabama, and South Carolina.

DISTRIBUTION IN FLORIDA.—Abundant and generally distributed over nearly the entire State, except the Florida Keys. Specimens have been examined from St. Marks, Aucilla River, Amelia Island, Ritta, Manatee, Miakka Lake, Braden River, Barnes River (east of Chokoloskee), Immokalee, Everglade, Deep Lake, La Belle, Larkin, Miami, Royal Palm Hammock, and Cape Sable. Those from the extreme southern end of the peninsula approach the island race (*extimus*) in small size and pale coloration.

HAUNTS AND HABITS.—This, the most abundant hawk in the State, lives chiefly in or near timbered swamps, but forages more or less over prairies and cultivated lands. The nests are placed in trees, anywhere from 18 to 75 feet above the ground, usually in a crotch or the forks of a limb. Cypress trees are preferred, with pines as second choice, and oaks third. Occasionally a cabbage palm, gum, or mangrove is selected. The favorite location seems to be on the borders of a swamp, but some nests are in open pine woods and others in oak or palmetto hammocks on the prairie. Nesting begins by the middle of February, or sometimes in January, and continues through March. On the Kissimmee Prairie, D. J. Nicholson found 16 nests ready for eggs between January 17 and 23, 1927. The nests are made of cypress or pine twigs and Spanish moss, and lined with soft shreds of bark, green oak or pine leaves, and shreds of Spanish moss. The usual number of eggs in that region is 2, or frequently 3.

In a small cypress tree on the border of a swamp at Lake Gentry, April 26, 1925, I noted a nest containing two large young standing up, one of them calling loudly for its breakfast in tones much like those of the parents.

The Florida Red-shoulder is not nearly so shy as the northern race, and the birds will often keep their perch while a person walks under the tree in which they are sitting. They are very numerous around the hammocks and swamps on the Cape Sable prairies. Sometimes 5 or 6 could be seen at once in the middle of the day, soaring at a height of several hundred feet and uttering their characteristic squealing notes.

FOOD.—Examination in the Biological Survey of 37 stomachs of this bird from Florida indicates a preference on the part of the birds for snakes, lizards, frogs, and insects. Snakes were found in 13 stomachs—usually only one to a bird; the species identified were garter snake (*Thamnophis sauritus*), king snake (*Lampropeltis*), coach-whip (*Coluber*

flagellum), black snake (*Bascanion constrictor*), and a species of *Natrix*. Lizards to the number of 10 were noted in 6 stomachs, the species being *Plestiodon fasciatus*, *Leiolopisma laterale*, and *Anolis carolinensis*. Frogs, 12 in number, were found in 9 stomachs. Four stomachs contained a mammal each, these being a marsh rabbit, a gray squirrel, a cotton rat, and a shrew (*Cryptotis floridana*), respectively. Four stomachs each contained a wild bird, the species being a Bobolink, a Towhee, a Florida Grackle, and a Boat-tailed Grackle. In one stomach were the remains of a domestic fowl. A turtle (*Kinosternon subrubrum*) was noted in one stomach, a toad (*Bufo quercinus*) in another, and crawfishes, 11 in number, in five others. Thirteen stomachs contained insects, principally grasshoppers and crickets, with a few beetles and caterpillars. Several birds had eaten only insects, some having consumed from 12 to 17 grasshoppers and crickets. Edward J. Brown tells me that he once saw one of these hawks eating a skunk (*Mephitis elongata*) apparently freshly killed; the bird tried to carry it off but could barely rise above the ground with it.

INSULAR RED-SHOULDERED HAWK: *Búteo lineâtus éxtimus* Bangs

RECOGNITION MARKS.—Similar to the peninsular race (*alleni*), but smaller and paler; length of male, 15 to 16 inches; wing, about 11 inches. (Plate 25.)

RANGE.—The Florida Keys; recorded from Cape Florida, Key Largo, Indian Key, Big Pine Key, Upper Matecumbe, Boca Chica, Bahia Honda, Grassy Key, and the Tortugas.

HAUNTS AND HABITS.—This small, pale race of the Red-shoulder lives about the hammocks on most of the Florida Keys and apparently has about the same habits as the Florida Red-shoulder.

BROAD-WINGED HAWK: *Búteo platýpterus platýpterus* (Vieillot)

RECOGNITION MARKS.—Smaller than the Red-shouldered Hawk (length, 13.5 to 18.5 inches; spread, 32 to 39 inches; tail, 6 to 8 inches). *Adult:* Upperparts mainly fuscous; underparts buffy white, barred with snuff brown, the *breast almost solid brown;* lining of wings silvery white, *without bars;* tail fuscous-black above, with a *broad band and several narrower bands of grayish white;* under side of tail mouse gray or hair brown. *Immature:* Underparts pale buff, only moderately streaked or spotted with brown; tail without prominent white bars. (Plate 28.)

RANGE.—Breeds from central Alberta, Ontario, Quebec, and New Brunswick south to the Gulf coast and central Texas. Winters from the Ohio and Delaware Valleys south to Venezuela and Peru.

DISTRIBUTION IN FLORIDA.—Generally distributed, breeding locally in small numbers throughout the State. Williams (1904, p. 454) records it as a common resident in Leon County, and Wayne (1895, p. 366) says it is one of the commonest hawks found breeding in the hill country about Waukeenah and on the Wacissa. Weston considers it rather rare in the Pensacola region. Specimens have been taken at St. Marks (June 14, 1913); Everglade, Collier County (March 10 and 16, 1922); Royal Palm Hammock (January 18, 1918); Palm Key, near Flamingo (March 29, 1925); Key Largo (December 25, 1923); Big Pine Key (March 4, 1921); and Key West (November 24, 1871; January 12, 1884; and November 15 and December 6, 1895). The bird has been observed at Coronado (December 30, 1908); Citrus Center (February 9, 1926); Manatee (breeding); Lake Harney (breeding); New Smyrna (January 26, 1918); Long Key (February 20,

1925); Gulfport (December 23, 1924); and Loggerhead Key, Tortugas (May 1 and 6, 1913). Atkins (Scott, 1889a, p. 248) reports a large flock of hawks—150 or more—mainly of this species, at Key West, October 21, 1887.

HAUNTS AND HABITS.—The Broad-winged Hawk is an inhabitant of wooded regions, and in the North is usually found in heavy forests near a lake or stream. In the Tallahassee region, R. W. Williams has found a number of nests with fresh eggs, 40 to 60 feet above the ground in pine trees in mixed woodland, about the last of April. One nest was noted also, 32 feet up in a magnolia tree. The nests, built on large, horizontal limbs next to the trunk, were composed of oak and pine twigs and moss, and lined with green pine needles, feathers, bits of bark, and a few sprays of fresh green leaves. On Palm Key, near Flamingo, March 29, 1925, E. J. Court found a nest with 2 eggs, 15 feet up in a black mangrove; it was made of sticks and lined with black-mangrove leaves.

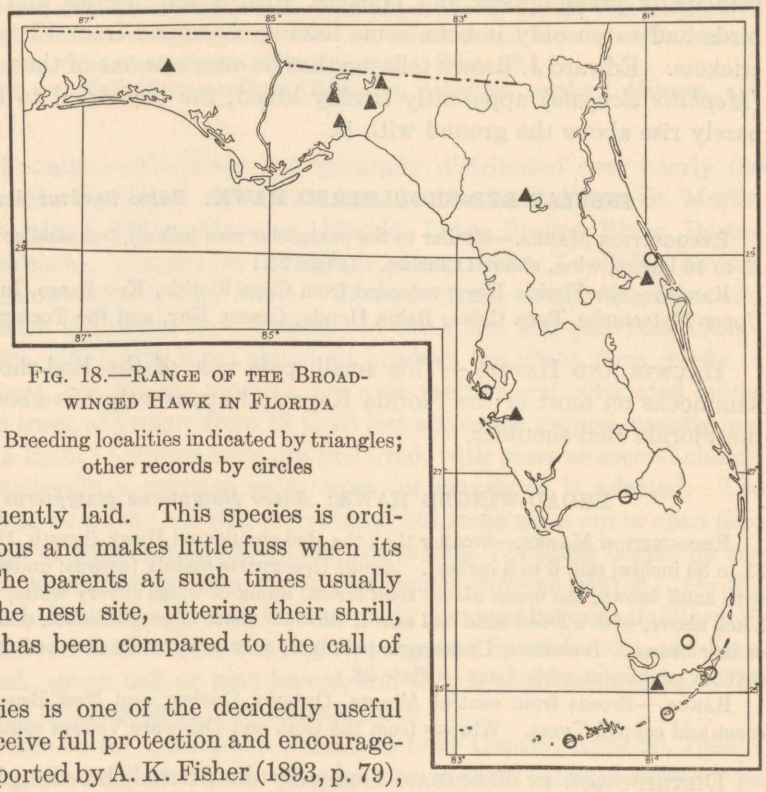


FIG. 18.—RANGE OF THE BROAD-WINGED HAWK IN FLORIDA

Breeding localities indicated by triangles; other records by circles

In Florida the clutch usually numbers two eggs, but in the Northern States, 3 or 4 eggs are frequently laid. This species is ordinarily very unsuspicious and makes little fuss when its nest is disturbed. The parents at such times usually circle about above the nest site, uttering their shrill, whistling cry, which has been compared to the call of the Killdeer.

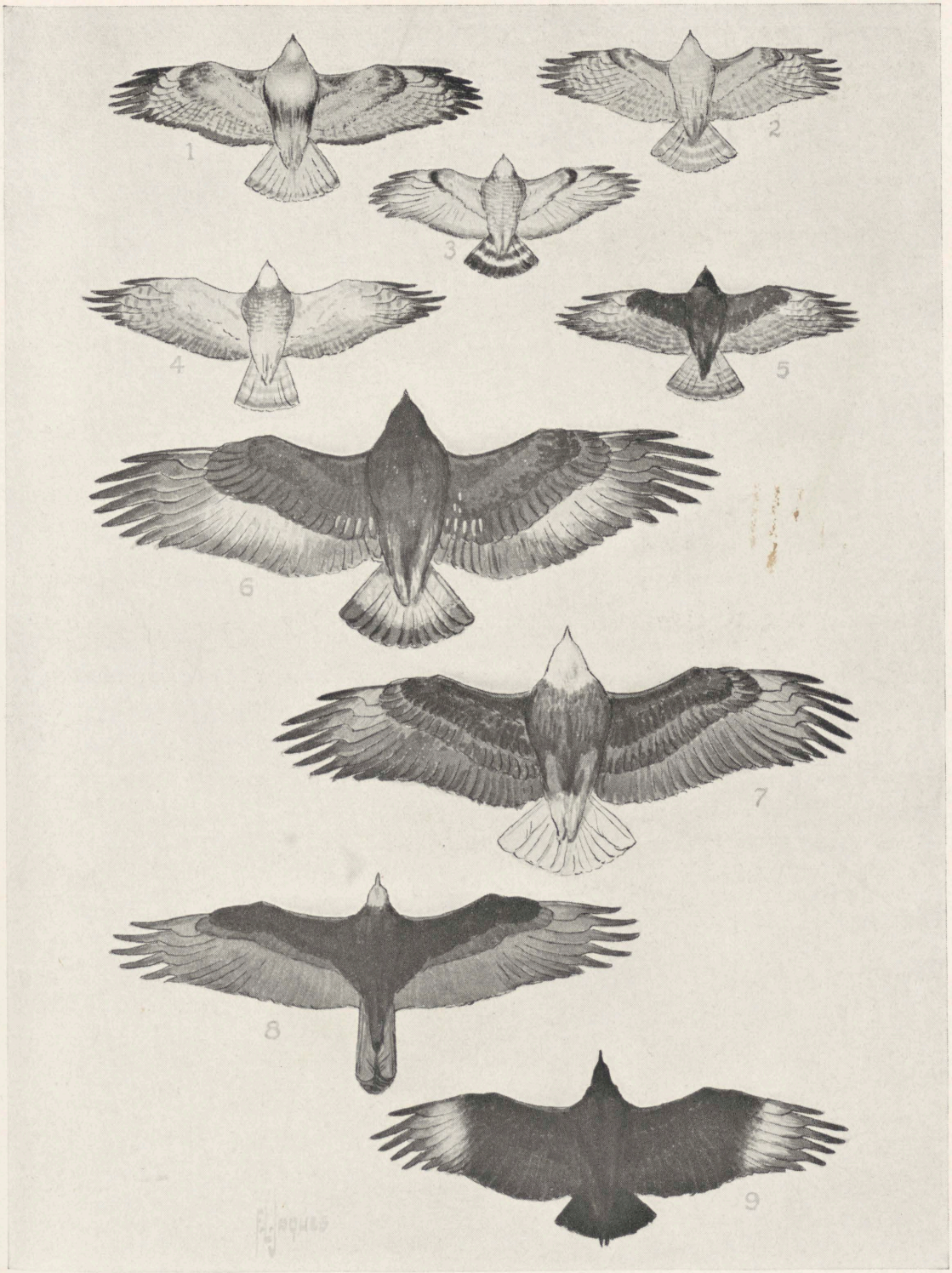
FOOD.—This species is one of the decidedly useful hawks, and should receive full protection and encouragement. Its food, as reported by A. K. Fisher (1893, p. 79), consists principally of insects, small mammals, reptiles, and batrachians, and occasionally of young or disabled birds. Of 65 stomachs examined in the Biological Survey, 2 contained small birds; 15, mice; 13, other mammals; 11, reptiles; 13, batrachians; 2, earthworms; 4, crawfishes; and 7 were empty. The smaller squirrels, chipmunks, and wood mice are most frequently taken; also field mice and shrews in lesser numbers. During the summer months a considerable proportion of the food consists of the larvae of large moths, such as the elm sphinx, the Cecropia, and the Polyphemus. Grasshoppers, crickets, and beetles also are consumed. The stomach of a specimen from Key Largo contained a lizard (*Anolis carolinensis*), a grasshopper (*Schistocerca alutacea*), and a centipede (*Scolopendra subspinipes*). Another bird from the same locality had eaten

FIG. 1.—NEST OF OSPREY IN A CYPRESS ON LAKE ISTOKPOGA. (*Photo by D. J. Nicholson*)

FIG. 2.—YOUNG EVERGLADE KITES IN NEST IN SAW GRASS ON ST. JOHNS RIVER MARSHES
(*Photo by D. J. Nicholson*)

FLIGHT SILHOUETTES AND PATTERNS OF SOARING KITES AND HAWKS

1. White-tailed Kite
2. Swallow-tailed Kite
3. Mississippi Kite
4. Everglade Kite
5. Goshawk
6. Sharp-shinned Hawk
7. Cooper's Hawk
8. Duck Hawk
9. Pigeon Hawk
10. Sparrow Hawk
11. Osprey
12. Audubon's Caracara
13. Marsh Hawk



FLIGHT SILHOUETTES AND PATTERNS OF SOARING HAWKS, EAGLES, AND VULTURES

1. Florida Red-tailed Hawk
2. Red-shouldered Hawk
3. Broad-winged Hawk
4. Swainson's Hawk
5. Short-tailed Hawk
6. Golden Eagle
7. Bald Eagle
8. Turkey Vulture
9. Black Vulture

FIG. 1.—NEST AND EGGS OF SWALLOW-TAILED KITE; REMOVED FROM POSITION AND PHOTOGRAPHED ON THE GROUND BY D. J. NICHOLSON

FIG. 2.—NEST AND EGGS OF EVERGLADE KITE IN A CYPRESS TREE ON WAKULLA RIVER
(*Photo by H. L. Stoddard*)

a cotton rat (*Sigmodon hispidus*), several large grasshoppers, and the larvae of four or more hawk moths.

SWAINSON'S HAWK: *Búteo swainsoni* Bonaparte

RECOGNITION MARKS.—Smaller than the Red-tailed Hawk (length, 18 to 22 inches; spread, 47 to 57 inches). *Adult* (normal phase): Upperparts and wings mainly dark fuscous; underparts buffy white, *with a broad, dark* band across breast; under side of tail smoke gray, crossed by numerous *narrow* fuscous bands. The dark phase is almost uniform dark fuscous or fuscous-black. (Plate 28.)

RANGE.—Breeds in western North America and South America from Fort Yukon, Alaska, northwestern Mackenzie, and Manitoba south to Chile and Argentina. Winters from Texas and Mexico southward. Casual in Quebec, Ontario, Michigan, New York, New England, and Florida.

DISTRIBUTION IN FLORIDA.—Casual in migration in extreme southern Florida. Cory, in his Birds of Florida (1896a, p. 13), lists this species. In a letter dated February 5, 1921, he stated that in the Field Museum there is an immature female of this species, taken by J. W. Atkins, November 28, 1895, at Key West. He said, also, that an adult bird from the same locality was destroyed when his museum at Palm Beach was burned in the late '90's, and that he remembered handling at least four specimens, all taken by Atkins at Key West. H. H. Bailey (1931b) records two specimens taken at Miami Beach, December 7 and 9, 1922, at which time a migratory flight was observed; and one taken at Key West, November 21, 1929.

SHORT-TAILED HAWK: *Búteo brachȳúrus* Vieillot

OTHER NAME: Little Black Hawk

RECOGNITION MARKS.—About the size of the Red-shouldered Hawk (length, about 18 inches; folded wing, 11.25 to 13 inches; tail, 7 to 8 inches). *Normal phase:* Upperparts nearly uniform fuscous, darker on head and neck with a small patch of white on forehead; underparts pure white; under side of wings chiefly white, the ends of the primaries dark mouse gray; under side of tail smoke gray, with several indistinct bars of light brown. *Dark phase:* Upperparts blackish brown (appearing black in life); underparts dark fuscous; tail as in the light phase. (Plates 25 and 28.)

RANGE.—Central and South America, from Peru, Bolivia, and Brazil north to eastern Mexico and Florida.

DISTRIBUTION IN FLORIDA.—Occurs locally in small numbers from Cape Sable north to Palatka, Gainesville, and St. Marks. The species was first made known as a resident of Florida in 1881, when Robert Ridgway published an account in Forest and Stream of the capture of a specimen by W. S. Crawford at Oyster [= Estero] Bay, on January 28 of that year (Ridgway, 1881a, p. 206). Another specimen was taken at Palatka, February 22, 1881, and recorded by Ridgway in an extended paper (1881e, pp. 207–214) in which he gave a full account of the species, as then known. At that time ornithologists were divided on the question whether the "Little Black Hawk" (*Buteo fuliginosus* Sclater) and the Short-tailed Hawk (*Buteo brachyurus* Vieillot) were the same or distinct species. Ridgway inclined to the latter view, but this has since been shown to be incorrect, for birds in the normal phase have been found mated with those in the melanistic phase.

Following its recognition as a member of the North American fauna, records of this

Hawk began to multiply. Specimens have been taken at Goose Creek (May 2, 1889); Gainesville (February 27, 1926); Ten Mile Creek, Brevard County (March 11, 1886); Wekiva River, Lake County (March 4, 1912); St. Johns River, Lake County (March 20, 1911); Tarpon Springs (March 16, 1889); Istokpoga Lake (April 1, 1910); Chatham Bay (November 12, 1888; February 2, 1889); Chatham Bend (January, 1894); Alligator Lake, Monroe County (April, 1925); Miami (November 16, 1900; October 11, 1883); Ten Thousand Islands (November 6, 1894; January 9, 1895); Key West (November 14, 1895; November 21, 1898; January 17, 1898); Cape Romano (December 15, 1886); Naples (March 1, 1918); and Fellsmere (March 23, 1928).

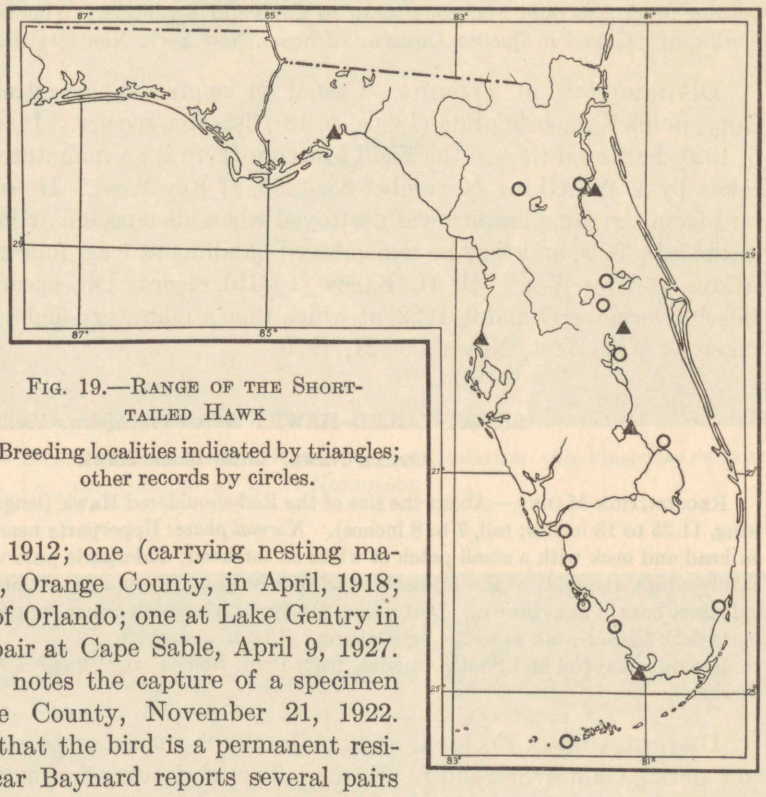


FIG. 19.—RANGE OF THE SHORT-TAILED HAWK

Breeding localities indicated by triangles; other records by circles.

D. J. Nicholson, of Orlando, who has been studying Florida birds for about 20 years, has in that time seen less than a dozen individuals of this species. Several were seen around Istokpoga Lake, in March, 1910; two on Taylor Creek, Okeechobee County, in January, 1912; one (carrying nesting material) on Mud Lake, Orange County, in April, 1918; one four miles south of Orlando; one at Lake Gentry in March, 1922; and a pair at Cape Sable, April 9, 1927. Bailey (1925a, p. 70) notes the capture of a specimen taken alive in Dade County, November 21, 1922. These dates indicate that the bird is a permanent resident in Florida. Oscar Baynard reports several pairs breeding near Rocky Lake, Hendry County. Although widely distributed in the State, it is nowhere common.

Scott (1889c, p. 243) recorded the capture of a pair at Tarpon Springs engaged in building a nest, the male being black and the female of the normal brownish color, with white underparts, and thus cleared up any doubts as to the relationship of the two color phases. The first egg obtained in Florida was collected in Goose Creek Hammock, near St. Marks, May 2, 1889, from a nest found by C. J. Pennock, this constituting also the most northerly record of the bird's occurrence (Pennock, 1890, p. 56). Dr. W. L. Ralph observed two nests near San Mateo, April 4, 1893, and May 12, 1899, from each of which a single egg was taken. D. J. Nicholson, in 1910, discovered three nests in the swamps surrounding Istokpoga Lake. One contained two young birds; another two incubated

PLATE 30

EXPLANATION OF PLATE 30

BIRDS OF THE PRAIRIES

On large areas of true prairie in central and southern Florida the three species of birds here shown occur commonly; at the left is a pair of Florida Cranes; flying is an immature Audubon's Caracara and below it an adult of the same species; at the lower right is a pair of Florida Burrowing Owls.

F. L. Jaques.

eggs; and the third was completed and ready for eggs. At the same locality, March 30, 1923, H. W. Brandt collected a nest with two eggs (Brandt, 1924, pp. 59–64).

HAUNTS AND HABITS.—This tropical species is a lover of deep cypress swamps; the nests are usually placed 30 to 95 feet above the ground in cypress trees in the heavy swamps; the nest at St. Marks, however, was in a large pine growing on the border of the cypress swamp, and the one recorded by Brandt was 58 feet above the ground in a slender magnolia in the swamp. (Plate 16.) E. J. Court found a nest at Cape Sable 25 feet up in a large red mangrove; the female was flushed from the nest on March 31, but at that date no eggs had been laid. The nests are composed of cypress twigs with a small amount of Spanish moss, and lined with fine cypress twigs and dry leaves. The normal clutch appears to be two eggs, which are bluish white in color, either plain or marked about the larger end with small reddish brown spots. The downy young found by Nicholson were white.

The pair of birds whose nest I found on Istokpoga Creek were not particularly shy; the black male would sit quietly for long periods in a large cypress tree about 100 yards from the nest. Once he left his perch to make a few circles in the air, then set his wings close to his body and shot down like a rocket at an angle of 45 degrees toward the swamp, screaming as he went. After I had located the nest and flushed the beautiful brown and white female, both birds circled about over the swamp, screaming at intervals for about 40 minutes. The alarm note is a single high-pitched squeal, quite unlike that of the Red-shouldered Hawk but somewhat resembling the high notes of the Osprey or the squeal of the Red-tailed. The female on one occasion, when flushed from the nest, uttered a cackling note like that of the Red-shouldered. Brandt says that this species spends much time high in the air, circling without a beat of the wings.

FOOD.—Little is known of the food habits of this Hawk. The single stomach, taken at Lake Harney and examined in the Biological Survey, contained the feet and other remains of a Sharp-shinned Hawk (*Accipiter velox*).

GOLDEN EAGLE: *Áquila chrysäëtos canadénsis* (Linnaeus)

OTHER NAME: **Mountain Eagle**

RECOGNITION MARKS.—About the size of the Bald Eagle (length, 30 to 40 inches; spread, 75 to 92 inches); *legs feathered all the way to the toes;* body plumage nearly uniform fuscous, the feathers on sides of head and neck marked with light buff and cinnamon; primaries blackish brown; tail with some whitish mottling on basal portion. Indistinguishable at a distance from the immature Bald Eagle, but the *feathered legs* are diagnostic. (Plate 28.)

RANGE.—The northern parts of the Northern Hemisphere; in North America, from northern Alaska, northwestern Mackenzie, and northern Ungava south to northern Lower California, central Mexico, mountains of New England (formerly), and in the Alleghenies to North Carolina; casual in winter in the Gulf States.

DISTRIBUTION IN FLORIDA.—Occurs rather frequently in winter in northwestern Florida. There are records of 5 birds killed near De Funiak Springs, as follows: January, 1896 (Howe and King, 1902, p. 28); January 17 and 31, 1908; November 1, 1909; and February 3, 1910 (Fisher, 1910, pp. 80, 206). One was shot at Walnut Hill, Escambia County, January 23, 1925, after it had killed several young kids (Weston, 1925b, p. 443).

HAUNTS AND HABITS.—The Golden Eagle inhabits the wilder, mountainous sections of the country. It is reported as a permanent resident in the mountains of North Carolina, and apparently some of the birds of that region wander southward into the low country in winter. It is a shy and wary bird, keen of sight, a strong and swift flyer, and able to kill and carry off animals the size of young pigs or lambs. It is said to hunt mostly by soaring or slow flying, dropping suddenly upon its prey. Its cry is described as "a sharp, harsh scream of few notes."

FOOD.—This Eagle is very destructive to young lambs, kids, pigs, and fawns. Rabbits and game birds, particularly grouse, form a considerable part of the bird's food; in the Western States ground squirrels, prairie dogs, and marmots or ground hogs are extensively eaten. The bird is considered to be more harmful than beneficial, especially in the Eastern States.

SOUTHERN BALD EAGLE: *Haliaëetus leucocéphalus leucocéphalus* (Linnaeus)

OTHER NAMES: **White-headed Eagle; American Eagle**

RECOGNITION MARKS.—Larger than any of the hawks or buzzards (length, 30 to 37 inches; spread, 72 to 90 inches); *lower half of tarsus naked. Adult:* Head and tail white; rest of body fuscous; primaries blackish brown. *Immature:* Head like rest of body, which may be more or less blotched with white (the white bases of the feathers showing in spots); tail dark fuscous, more or less mottled with light grayish. (Plates 9 and 28.)

RANGE.—United States, south to southern Lower California and central Mexico. Rare and local in California and in the arid interior States.

DISTRIBUTION IN FLORIDA.—A common permanent resident along the seacoasts and on the inland waters. Breeding records are at hand from Pensacola, St. Vincent Island, St. Marks, Chassahowitzka River, Lake Apopka, Lake Jessup, Lake Kissimmee, Port Orange, Bradenton, Silver Lake, Oyster Keys, Manofwar Key, Key West, Upper Matecumbe Key, and many points in Palm Beach County, along the border of the Everglades.

HAUNTS AND HABITS.—The Bald Eagle is probably more abundant in Florida than anywhere else in the United States. Dr. William L. Ralph, who spent three winters in the vicinity of Merritt Island (from 1886 to 1888), states that he found during that period nearly 100 occupied nests. Near Rock Ledge he would sometimes see 15 or 20 Eagles within a short distance, roosting in the trees (Bendire, 1892b, p. 276). That the birds are maintaining their numbers in that region at the present time is shown by the investigations of D. J. Nicholson and J. C. Howell, Jr., who, in December, 1930, found 37 occupied nests in Volusia, Brevard, and Orange Counties—most of them being on Merritt Island.

The nest of this Eagle is generally built in a tall pine tree in the vicinity of some large body of water, at a height of 50 to 100 feet above the ground, though sometimes as low as 30 feet. (Plate 17.) On the Keys, where no large trees are available, the birds may build even as low as 20 feet in a black mangrove. The nest is a huge structure, often 9 feet high and 4 or 5 feet wide, made of sticks, sometimes 5 feet long, with considerable Spanish moss, bark, and pine "straw." The eggs, two in number, are usually laid in winter, from early in November to early in February, but in northern Florida sometimes

in April. A pair was observed near Pensacola, April 8, 1927, carrying lining material for their nest, in which two young were reared that season (E. R. Smith, 1927, p. 114). The same nest is occupied from year to year, and as a result of annual additions, often reaches enormous proportions. D. J. Nicholson reports a nest near Orlando that had been in use more than 20 years.

Ralph (Bendire, 1892b, pp. 276, 277) thus describes the birds' actions at the nest:

> Both sexes assist in incubation, and are equally solicitous in the care of their eggs and young. They show great distress when their nests are disturbed, but are very careful to keep just out of gunshot and I can recall but one instance of the Bald Eagles attacking anyone. . . . These birds would swoop down and almost strike the head of my climber. . . . The cry of the male is a loud and clear "*cac-cac-cac*," quite different from that of the female, so much so that I could always recognize the sex of the bird by it.

Food.—The principal food of the Bald Eagle, considering its range as a whole, appears to be fishes. These are obtained both by the Eagle's own efforts in diving and also by robbing the Osprey of its prey, the Eagle seizing the fish in the air after the Osprey has been forced to drop it. Dead fishes are also eaten to some extent. In Florida, at least during the winter season, wild ducks and Coots are extensively preyed upon, and according to Ralph, furnish at that time the chief article of food for the Eagles. He mentions one Eagle's nest in which he found the remains of 13 Coots and 1 catfish (Bendire, 1892b, p. 274). Batchelder (1881, p. 58), quoting John W. Baker, gives a graphic account of an Eagle's method of capturing Coots on the St. John's River, and Worthington (quoted by Bendire, 1892b, p. 279) describes the capture of a Florida Cormorant seized from the surface of the water. Wounded ducks are frequently snatched up by the Eagle before the eyes of the hunter, and a writer in Bird-Lore (Schroder, 1923, p. 122) relates an instance of an Eagle hovering over a flock of Scaups and seizing one of the ducks by a sudden dash.

Refuse beneath two Eagles' nests in Hillsborough County, examined by Alexander Wetmore, included the remains of the following animals: 9 ocean catfishes (*Hexanematichthys felis*), 1 needle fish (*Tylosurus marinus*), 3 cormorants, 1 merganser, 9 Lesser Scaups (*Marila affinis*), 1 Royal Tern (*Sterna maxima*), 1 Laughing Gull (*Larus atricilla*), and 1 Wild Turkey (*Meleagris gallopavo*).

D. J. Nicholson records the following items found in a nest, December 15, 1929: 1 red snapper, 11 inches long; 1 catfish, 15 inches long; 1 mullet, 12 inches long; and the hinder part of a Pied-billed Grebe. In a nest examined October 26, 1930, he found a partly eaten catfish weighing about 2½ pounds; in another found the same day were 3 freshly-killed Pied-billed Grebes, a quantity of feathers of a Coot, and the empty shell of a turtle, 7 inches in length. In December, 1930, Nicholson examined several more nests, finding in them the following food items: Swamp rabbit, Little Blue Heron, the legs of a Snowy Egret, feathers of Scaup Ducks and of a tern, sergeant fish, and crevalle.

MARSH HAWK: *Circus hudsónius* (Linnaeus)

Other Names: **Mouse Hawk; Marsh Harrier; Rabbit Hawk**

Recognition Marks.—About the size of the Red-shouldered Hawk (length, 18 to 24 inches; spread, 40 to 54 inches), but appearing larger in flight, because of longer wings and tail; *upper tail coverts white* (conspicuous in flight). *Adult male:* General color of body and wings pale neutral gray, shaded on back

with hair brown (dark drab); belly white with cinnamon spots; lining of wings *chiefly white*, the ends of the primaries fuscous; tail with 5 to 7 fuscous crossbars. *Adult female:* Upperparts fuscous, mottled with cinnamon or buff; underparts buffy white, broadly streaked with fuscous; under side of wings (including primaries) *barred with white and dark mouse gray. Immature:* Similar to the adult female, but underparts tawny or dark cinnamon, narrowly streaked with fuscous. (Plates 20 and 27.)

RANGE.—Breeds from northwestern Alaska, northwestern Mackenzie, central Quebec, and Newfoundland south to northern Lower California, southern Arizona, southern Texas, southern Illinois, southern Indiana, Ohio, Maryland, and southeastern Virginia, and casually to Florida. Winters from southern British Columbia, Montana, South Dakota, southern Wisconsin, southern New York, and New England south to the Bahamas, Cuba, and Colombia.

DISTRIBUTION IN FLORIDA.—An abundant winter resident throughout the State in suitable localities; most numerous on the prairies and marshes in central and southern Florida. Breeds sporadically in northern Florida. Migrants from the North usually arrive in September (Pensacola, September 10, 1923, September 6, 1926; St. Marks, September 14, 1915, September 15, 1918); but exceptionally early birds appeared at Pensacola August 27, 1924; August 26, 1929; and August 23, 1930. Most of the birds depart in spring during April, but some linger into May (Everglade, Collier County, May 5, 1928; St. Marks, May 16, 1914; Coronado, May 23, 1924).

I noted numbers of the birds on the Kissimmee Prairie in the latter half of March, 1923, and on the Everglades in Palm Beach County, April 16 and 17, 1923. A few were seen at Cape Sable, March 27 to April 7, 1926, and Holt and Sutton reported them common in the same region, March 11 to 27, 1924. Scott (1889a, p. 247) records the species common at Key West, and Bartsch reports it from the Tortugas, May 1 to 5, 1913, and April 25 to 27, 1914.

Oscar E. Baynard furnishes several breeding records from Florida, as follows: At Micanopy, on or about May 11, 1908, he took a set of 4 partly incubated eggs from a nest on a floating tussock in Orange Lake. This nest was a piled-up mass of dry grass in a clump of *Sagittaria*, and was visible for a considerable distance. Another nest with 3 young was found early in June on Tuscawilla Lake, near Micanopy, and a third containing young early in June on Paines Prairie, near Gainesville.

HAUNTS AND HABITS.—Marsh Hawks spend most of their time in winter coursing at a low altitude over fields, meadows, and marshes in search of food. Their flight is easy and graceful, accomplished mainly by skillful gliding with occasional flappings. Frequently, when facing a good breeze, the bird may hold itself nearly motionless in the air while it scans the ground below, then drop suddenly upon its prey in the grass, which is usually devoured on the spot. In the air, the species is easily recognized by its long wings and tail, its manner of flight, and the conspicuous white patch on the rump. The birds are ordinarily voiceless and rather prosaic while seeking their prey, but during the breeding season, they display greater activity. Bendire (1892b, p. 184) says: "Pairs of these birds may be seen at this time playing with each other, sailing around in graceful gyrations, turning over and over, and uttering shrill screams of delight while engaged in these aerial evolutions." Concerning these activities, Forbush (1927, vol. 2, p. 102) writes:

> The courtship of the Marsh Hawk is carried on largely in its favorite element. In warm spring days a pair may be seen soaring to a great height, when one will suddenly plunge far downward and turn a

complete forward or sidelong somersault in the air. Sometimes one falling thus from a height will turn over and over again in the manner of a tumbler pigeon.

This Hawk is ordinarily not bold or aggressive, but Maynard (1881, p. 283) relates an instance of one that he observed in Florida robbing a Peregrine Falcon of ducks that it had captured.

Food.—The Marsh Hawk has been shown to be mainly beneficial in its food habits. Field mice and rats furnish the bulk of its food in the East, with a smaller percentage of small wild birds, frogs, snakes, and insects. It rarely or never attacks poultry, and its attacks on game birds are confined chiefly to rails, Coots, and wounded waterfowl. Doctor Ralph (quoted by Bendire, 1892b, p. 184) says: "In Florida I have often had these birds come at the report of my gun and try to carry off the ducks that I had shot, and sometimes they would be so persistent that I could almost catch them before they would leave."

Examination of 1,098 pellets or castings of this species found on a Quail preserve in Leon County, Florida, showed that only four Quail had been eaten by the Hawks, whereas 925 of the pellets contained the remains of one or more cotton rats (*Sigmodon*)—one of the most serious enemies of the Quail in that region (Stoddard, 1926a, p. 39).

AMERICAN OSPREY: *Pandion haliaëtus carolinensis* (Gmelin)

Other Name: **Fish Hawk**

Recognition Marks.—About the size of the Red-tailed Hawk (length, 21 to 24.5 inches; spread, 54 to 60 inches), but with longer wings which appear strongly curved in flight; wings, tail, and upperparts fuscous; head white, with fuscous patches on crown and nape and *a broad stripe behind the eye* (conspicuous in life); under side of wings and tail showing considerable white, with mouse gray crossbars; entire underparts white, the breast sometimes with a few fuscous spots. (Plates 9 and 27.)

Range.—Breeds from northwestern Alaska, northwestern Mackenzie, northern Quebec, and Newfoundland south to Lower California, western Mexico, and southern Florida. Winters from the southern United States to the West Indies and Central America. Occurs casually in South America.

Distribution in Florida.—An abundant resident over the greater part of peninsular Florida; rare in winter in the northern parts of the State. Pennock (1920a, p. 9) reports the birds as absent from Wakulla County during most of November, December, and January, and as arriving February 13, 1917. Weston, at Pensacola, records the earliest arrivals in spring on February 17, in both 1918 and 1924, and the latest seen in autumn on November 22, 1925. At Daytona Beach, they are said to be uncommon in midwinter. Worthington (1926, p. 212) mentions a pair remaining all winter on Choctawhatchee Bay, and notes the arrival of migrants on February 20, 1903.

The Osprey nests commonly along all the coasts and on the lakes and streams of the interior, being particularly abundant on Lake Okeechobee and Lake Istokpoga. Around the latter lake, in the spring of 1910, D. J. Nicholson found 75 occupied nests. At Island Pond, near Maytown, April 7, 1929, he noted a colony of 15 to 20 pairs nesting; some of the eggs were fresh on that date, others hatching. The birds are reported to breed on the Marquesas Keys, on Snipe Key, Upper Matecumbe, Boca Grande, and Key West. Bartsch records the species on the Tortugas in April and May.

HAUNTS AND HABITS.—Florida furnishes a wealth of ideal situations and an abundance of food for birds that live on fish, and the Ospreys have taken full advantage of the opportunities thus afforded. A favorite site for the nest is near the top of a cypress standing in a lake or on the shore of a river, the height ranging from 14 to more than 100 feet above the ground. Sometimes a dead pine is chosen, or a cypress stub standing in water. (Plate 28.) The nests are bulky, sometimes 3½ feet in diameter and 2½ feet in height, made of cypress or pine sticks and Spanish moss, and lined with moss, cypress bark, and sometimes with water hyacinth plants or palmetto leaves. The eggs are usually 2 or 3 in number, very rarely 4. Egg laying begins in the Okeechobee region early in February and continues to the middle of April. On the Keys the birds nest even earlier; several nests with eggs were recorded on Boca Grande Key, January 6, 1919 (Bartsch).

Ospreys are expert fishermen and all their food is taken alive by their own efforts. They sometimes strike from a height as great as 50 feet and disappear completely beneath the water. Rising with a fish in its talons, the bird gives a shiver to its body to shake off the water, and flies to a favorite perch on the land, sometimes at a considerable distance, where it devours its meal. Occasionally an Osprey is attacked by a Bald Eagle and forced to give up its prey to the larger bandit. The notes of the Osprey are a series of short, mellow whistles, several times repeated.

FOOD.—The diet of this Hawk consists wholly of fishes, among which are included menhaden, herring, shad, catfish, perch, trout, salmon, mullet, and tom-cod. Bendire (1892b, p. 324) states that in Florida the birds live almost entirely on catfish. Their destruction of important food fishes is probably inconsiderable.

AUDUBON'S CARACARA: *Polýborus chériway aúduboni* Cassin

OTHER NAMES: **Caracara Eagle; Mexican Eagle; Mexican Buzzard; King Buzzard**

RECOGNITION MARKS.—About the size of the Osprey (length, 21 to 23 inches; spread, about 48 inches; tail, 8 to 10 inches), but with shorter wings and *very long legs;* bill heavy, reddish at base; skin at base of bill naked; crest feathers elongated. *Adult:* Head, back, and wings fuscous-black; throat white; middle portion of primaries with white markings; breast, neck, and shoulders pale buff, barred with fuscous; belly fuscous-black; tail buffy white for basal two-thirds, crossed by numerous dusky bars; end of tail fuscous. *Immature:* Body plumage snuff brown; breast pale cinnamon-buff, without barring. (Plates 27 and 30.)

RANGE.—From northern Lower California, southwestern Arizona, Texas, and Florida south to Central America.

DISTRIBUTION IN FLORIDA.—A common resident in the prairie region of central Florida, north to northern Brevard County, and south to Fort Pierce, Okeechobee Lake, Rocky Lake (Hendry County), the Okaloacoochee Slough, and Everglade (Collier County). Occurs casually north to Enterprise (Bryant, 1859a, p. 6) and St. Augustine, and south to Royal Palm Hammock.

Audubon discovered this bird near St. Augustine on November 24, 1831, and after several vain attempts to shoot one, finally obtained a specimen a few days later through the aid of a friend. Supposing it to be a new species, he sent a detailed description of it to Dr. Richard Harlan, of Philadelphia, requesting him to name the bird (Burns, 1909,

p. 103). This he did not do, however, and Audubon, in his second volume, published a full account of the species under the name *Polyborus vulgaris* (1834, p. 350). Many years later Cassin (1865, p. 2) named the bird after Audubon. Records of the species at St. Augustine in 1831 and at Enterprise about 1858 indicate a wider range at that time for the bird than at present. Breeding records are at hand from St. Johns River (west of Indian River City), Lake Kissimmee, Lake Istokpoga, Lake Flirt, Manatee River, Cabbage Bluff (Kissimmee River), Fort Pierce, Deerfield Prairie (12 miles west of Malabar), and Everglade.

HAUNTS AND HABITS.—The Caracara is essentially a bird of the open country, and is found on the prairies and the borders of the Everglades. It is probably most numerous on the Kissimmee Prairie, where it nests commonly, 12 to 55 feet above the ground in the tops of cabbage palmettoes. The nests are rough, bulky structures, made of weeds, bushes, and vines piled in a heap and trampled down to form a depression. The eggs, usually two or three in number (rarely 4), are laid in the winter or early spring, usually in February or March, but sometimes earlier. D. J. Nicholson found a nest containing fresh eggs on December 17, 1922; and between January 17 and 23, 1927, he noted 14 nests on the Kissimmee Prairie, most of them with eggs, but one with young two weeks old.

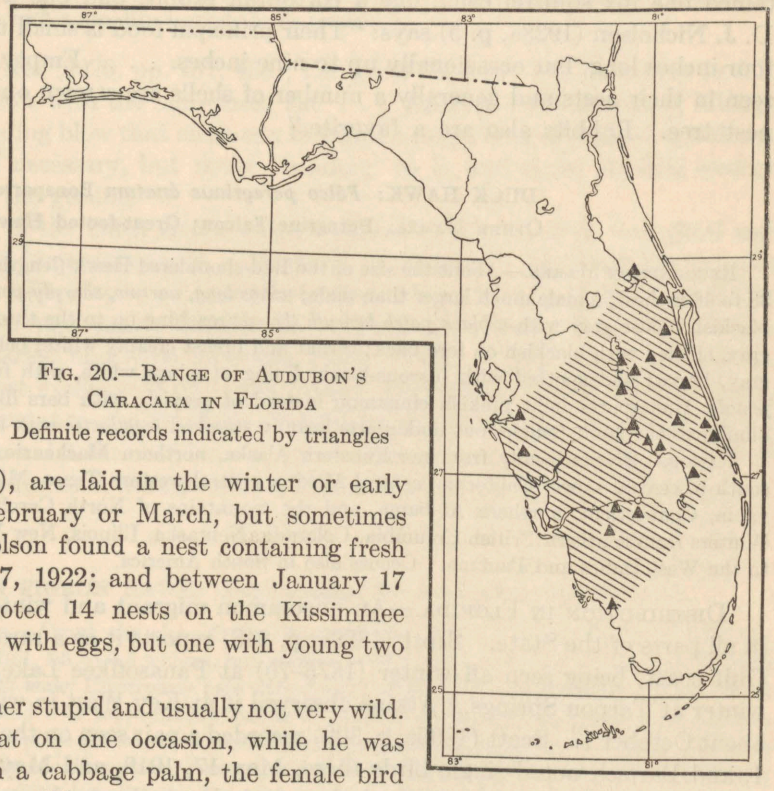


FIG. 20.—RANGE OF AUDUBON'S CARACARA IN FLORIDA
Definite records indicated by triangles

Caracaras are rather stupid and usually not very wild. Nicholson relates that on one occasion, while he was climbing to a nest in a cabbage palm, the female bird remained on the nest until he was within 4 feet of her, when she flew to a stub about 12 feet away and watched him. The male soon joined her and together they uttered a rasping cackle, with their heads bent back upon their backs. They feed on the ground in the manner of buzzards, and when approached too closely, will often simply hop and run away for a short distance. Their flight is strong and graceful, often performed in large circles at a great height.

Audubon states that the Caracara walks about in the water in search of food, and now and then will seize a frog or a very young alligator and drag it to shore. They join the Black Vultures and Turkey Vultures in their carrion feasts and usually make these

birds stand at a distance until they have been satisfied. In the West, they are said to feed on live fishes and frogs and to capture prairie dogs and jack rabbits. On the coast of Texas, according to B. F. Goss (in Bendire, 1892b, p. 315), they attack the Brown Pelicans returning to their nests and cause them to disgorge the fish in their pouches. The Florida Caracaras, however, are rarely found on the coast and so do not come in contact with the Pelicans.

Food.—With habits resembling those of both the eagles and the vultures, the Caracara is considered a beneficial bird. In addition to carrion, the birds catch and eat lizards, snakes, frogs, young alligators, crabs, crawfishes, insects, cotton rats, rabbits, and mice. Of five stomachs of this species examined in the Biological Survey, two contained one fox squirrel each, one a cottontail rabbit, and one a Pectoral Sandpiper. D. J. Nicholson (1928a, p. 5) says: "Their principal food is small turtles about three or four inches long, but occasionally up to nine inches. . . . Empty shells are sometimes seen in their nests and generally a number of shells are strewn on the ground near the nest tree. Rabbits also are a favorite."

DUCK HAWK: *Fálco peregrínus ánatum* Bonaparte

Other Names: **Peregrine Falcon; Great-footed Hawk**

Recognition Marks.—About the size of the Red-shouldered Hawk (length, 15 to 20 inches; spread, 38 to 46 inches); female much larger than male; *wings long, narrow, sharply-pointed. Adult male:* Head blackish mouse gray with *a black patch beneath the eye* reaching on to the throat; upperparts deep gull gray, shaded with blackish on fore back; throat and breast creamy white; belly and sides pale neutral gray, barred and spotted with fuscous-black; lining of wings white, with fuscous crossbars. *Adult female:* Underparts light pinkish cinnamon instead of grayish, with bars like the male. *Immature:* Similar to the adult female, but underparts heavily streaked *lengthwise* with fuscous. (Plate 27.)

Range.—Breeds locally from northwestern Alaska, northern Mackenzie, and western Greenland south to central Lower California, central Mexico, central western Texas, Missouri, Indiana, Pennsylvania, Connecticut, northern Alabama, and the mountains of North Carolina and South Carolina. Winters from southern British Columbia, Colorado, Nebraska, Illinois, New York, and Massachusetts to the West Indies and Panama. Occurs also in South America.

Distribution in Florida.—An uncommon migrant and winter resident, occurring in all parts of the State. Scott (1889a, p. 248) reports it as a rare winter visitor on the Gulf coast, being seen all winter (1875–76) at Panasoffkee Lake, and regularly every winter at Tarpon Springs. Atkins observed it at Key West in winter, where it arrived about October 1. Scott (1890e, p. 309) recorded a pair seen on the Tortugas about April 1, and Bartsch noted single birds there, May 17, 1919, and May 13, 1922. Maynard (1881, p. 300) describes the method of a certain Duck Hawk of capturing Scaup Ducks on the Indian River.

Weston has seen the bird a few times at Pensacola—February 22, 1922; January 1, 1927; August 11, 1928; and September 15, 1929. R. W. Williams (1914, p. 495) mentions two seen in Leon County in December, 1911, and Stoddard and Handley (1925, p. 45) record four seen in the same county, December 24, 1924. We noted two birds on the beach at East Pass (Choctawhatchee Bay), April 24, 1926. E. W. Nelson saw two on Lake Hicpochee in March, 1923. Longstreet has observed the birds several times at Daytona Beach—October 5, 11, and 18, 1924; September 28, 1925; and September 19,

1926. Bent records one bird near Pass-a-Grille, from December to March. Holt and Sutton (1926, p. 429) reported one seen at 'Gator Lake, near Cape Sable, March 21, 1924, and B. H. Christy noted one at the same place, March 8, 1927.

HAUNTS AND HABITS.—Audubon (1831, p. 86) describes the habits of this falcon as follows:

> The flight of this bird is of astonishing rapidity. It is scarcely ever seen sailing, unless after being disappointed in its attempt to secure the prey which it has been pursuing, and even at such times it merely rises with a broad spiral circuit, to attain a sufficient elevation to enable it to reconnoitre a certain space below. It then emits a cry much resembling that of a Sparrow Hawk, but greatly louder, like that of the European Kestrel, and flies off swiftly in quest of plunder. The search is often performed with a flight resembling that of the tame pigeon, until perceiving an object, it redoubles its flappings, and pursues the fugitive with a rapidity scarcely to be conceived.

According to Fuertes (1920, pp. 437, 458), Peregrine Falcons "kill their prey in full flight, by a terrific blow with the half-closed fist . . . dashing down headlong, hitting their quarry a resounding blow that often can be heard a long distance, following it down and striking again if necessary, but never 'bending' to it, and never striking quarry that is sitting or on the ground."

FOOD.—The food of the Duck Hawk consists almost wholly of birds, waterfowl and shore birds being most frequently taken. The birds are at times very destructive to both poultry and pigeons. They have been known to feed also on petrels, gulls, terns, Night Herons, Quail, doves, and many smaller birds, such as Robins, Catbirds, Brown Thrashers, Meadowlarks, and even swallows. Scott (1881, p. 17) observed them in Florida preying almost exclusively on Coots (*Fulica americana*). H. H. Bailey (1927, p. 137) describes an instance of a Duck Hawk catching pigeons in the city of Miami, on September 18, 1926, a habit that has been noted in other cities as well. The stomach of a bird killed at Lake Iamonia contained two Meadowlarks, one sparrow (*Spizella* sp.), and one dragon fly.

EASTERN PIGEON HAWK: *Fálco columbárius columbárius* Linnaeus

RECOGNITION MARKS.—About the size of the Sharp-shinned Hawk (length, 10 to 13.5 inches; spread, 23 to 26 inches; tail, 4.5 to 5.5 inches), but of more stocky build, with shorter legs and tail and *long pointed wings*. *Adult male:* Upperparts pale slate-gray, darker on head and shoulders; tail with a wide subterminal band and 3 or more narrow bands of fuscous, or fuscous-black; underparts white, streaked with fuscous, except on throat; underside of primaries hair brown (dark drab), with numerous broad white bars. *Adult female:* Upperparts fuscous; tail similar, crossed by 3 or 4 narrow bands of buffy white; underparts buffy white, heavily streaked with fuscous. (Plate 27.)

RANGE.—Breeds from tree limit in southeastern Mackenzie and Ungava south to southern Manitoba, northern Michigan, central Ontario, and northern Maine. Winters from the Gulf States south through eastern Mexico, Central America, and the West Indies to Ecuador and Venezuela.

DISTRIBUTION IN FLORIDA.—An uncommon migrant and winter resident in all parts. Migrants from the North appear in September or October (Eustis, September 19, 1925; Punta Rassa, September 26 and October 5, 1886; Fernandina, September 26, 1906; Pensacola, September 20, 1925, and October 3, 1926; Key West, October 16 and 18, 1888; and Leon County, October 12, 1901). There are winter records from Fruitland

Park (February 14 to 17, 1903); Cedar Keys (December 1, 1870); New Smyrna (December 22, 1921); DeLand (December 23, 1925); Cape Romano (January 17, 1916); Miakka (December 5, 1906); and Punta Gorda (February 6, 1926). Specimens were taken on the Tortugas, April 17, 18, and 25, 1890, and Bartsch noted a single bird there daily from May 12 to 17, 1922. Weston observed one at Pensacola, April 5, 1925, and P. A. Du Mont saw one near Dunedin, April 30, 1929.

HAUNTS AND HABITS.—The Pigeon Hawk, nesting as it does far from the haunts of man, is one of the least wary of our hawks and may sometimes be approached very closely. During its migrations it haunts the more open country and the borders of woodland and is frequently very numerous in September and October along the ocean beaches. It flies rapidly, with an unsteady motion, flapping its wings frequently, and occasionally skimming swiftly above the fields in its search for prey. It is a daring marauder, often attacking birds as large as a pigeon or a Flicker and sometimes even a teal or a ptarmigan.

FOOD.—The food of this little Hawk consists principally of wild birds and insects and a few small mammals. It rarely attacks poultry and does little damage to man's interests. The birds most often captured by this Hawk are the various species of sparrows, with an occasional warbler, vireo, or thrush. The insects eaten include grasshoppers, dragon flies, and beetles.

WESTERN PIGEON HAWK: *Fálco columbárius béndirei* Swann

RECOGNITION MARKS.—Similar to the eastern race (*columbarius*), but male lighter above; tail black, with three bands of grayish white (instead of slate-gray); female similar to *richardsoni* above, but a shade darker brown (Swann, 1922, p. 66).

RANGE.—Breeds from northwestern Alaska, Yukon, and northwestern Mackenzie to British Columbia, northern and western Alberta, northern Saskatchewan, and south in the mountains to northern California. Winters south through California and New Mexico to the Cape region of Lower California and northeastern Mexico; also in Louisiana, Florida, and North Carolina (Peters, 1927, p. 3).

DISTRIBUTION IN FLORIDA.—Known from only two records: Tortugas Keys, April 8, 1890; and Key West, October 27, 1896 (Peters, loc. cit.).

LITTLE SPARROW HAWK: *Fálco sparvérius páulus* (Howe and King)

OTHER NAMES: Killy-hawk; Tilly

RECOGNITION MARKS.—The smallest of the Florida hawks (length, 8.75 to 12 inches; spread, 20 to 24 inches; tail, 4.25 to 6.00 inches); much smaller than the Sharp-shinned Hawk, with longer, *more pointed wings*. *Adult male:* Top of head russet, bordered by pale slate-gray; back vinaceous-russet, with more or less broken, blackish crossbars; upper wing coverts pale slate-gray; sides of head with two blackish patches; breast cinnamon; belly pinkish buff, with numerous round blackish spots. *Adult female:* Upperparts and tail like the male, but with numerous narrow bars of deep neutral gray; wing coverts *tawny* instead of slate color, with dark bars; underparts streaked with fawn color. (Plates 24 and 27.)

RANGE.—Resident in Florida, southern Georgia, and southern Alabama.

DISTRIBUTION IN FLORIDA.—Resident and locally common throughout the State, except on the Lower Keys, where it is not known to breed. Specimens have been ex-

amined from Portland, St. Marks, Bronson, Manatee, Miakka Lake, Everglade (Collier County), Florida City, Homestead, and Royal Palm Hammock.

HAUNTS AND HABITS.—The Little Sparrow Hawk inhabits the open pine forests and clearings where dead trees are found. Its nest is almost invariably located in an old woodpecker's hole in a dead pine stub, 12 to 35 feet above the ground. The eggs, 3 to 5 in number, are laid from March 20 to early in June, two broods sometimes being reared. The birds spend much of their time sitting on a stub, fence post, telephone pole, or similar point of vantage, from which they keep a sharp lookout for their prey on the ground below. Launching into the air, they fly with a peculiar, hesitating, butterfly locomotion, and after hovering for a few moments over the object of their search, drop lightly to the ground, and seizing their prey in their claws, return to their perch to devour it. Small birds, and sometimes birds almost as large as the hawk itself, are captured by a swift dash into the brush. A brush fire is sure to attract all the Sparrow Hawks in the vicinity to capture grasshoppers or other insects driven out by the fire. C. J. Pennock mentions having seen thirteen of these hawks feeding over a raging marsh fire at St. Marks on February 9, 1914. The alarm notes of this species are loud and shrill, *killee, killee,* sharply accented.

FOOD.—This little Hawk is one of the most beneficial species of its family, being almost wholly insectivorous. Of 320 stomachs examined in the Biological Survey (A. K. Fisher, 1893, p. 127), 215 contained insects; 29, spiders; 89, mice; 12, other mammals; 12, reptiles or batrachians; and 54, other birds. The contents of 25 additional stomachs from Florida, examined since Doctor Fisher's report (but the results not yet tabulated), bear out the strong preference of the bird for an insect diet. All but one of these stomachs contained insects, most of which were grasshoppers. Other insects found in the contents were crickets, katydids, caterpillars, dragon flies, carrion beetles, longhorn beetles, and cave crickets. Seven of the birds had eaten lizards, but not one had taken a bird. Baker (1890, p. 268) records two birds killed at Micco as having eaten a Myrtle Warbler and a Phoebe in addition to a tree frog and a number of insects.

Owing to the abundance of grasshoppers and other insects during most of the year, this race of the Sparrow Hawk probably lives more exclusively on insects than does the northern race. Instead of Sparrow Hawk, this species might better be called the "Grasshopper Hawk." Of the numerous individuals seen around Miami, Maynard (1881, p. 297) says that he never saw one take any other food than grasshoppers. Cotton rats (*Sigmodon*) and white-footed mice (*Peromyscus*) are frequently captured by this little hawk.

EASTERN SPARROW HAWK: *Fâlco sparvérius sparvérius* Linnaeus

RECOGNITION MARKS.—Similar in color to the resident race (*paulus*), but larger (wing of male, 6.97 to 7.35 inches; of female, 7.06 to 7.63 inches).

RANGE.—Breeds from the Upper Yukon valley, northwestern Mackenzie, and Newfoundland south to Texas, northern Alabama, and northern Georgia. Winters from Kansas, Ohio, and Massachusetts south through eastern Mexico to Costa Rica.

DISTRIBUTION IN FLORIDA.—Ranges throughout the State in winter; specimens of this race have been examined from Portland, November 17, 1902; January 5 and 20

and February 2, 1903; St. Marks, February 9, 1914; January 22, 1915; Pass-a-Grille, March 5 and 19, 1925; northern Leon County, September 24, 1926; Jefferson County, September 22, 1925; Bear Lake, Monroe County, March 27, 1924; and Key West, January 12 and March 23, 1885. Atkins (in Scott, 1889a, p. 248) records the birds as absent from Key West in summer, the earliest migrant being noted September 30, 1888. D. J. Nicholson observed the birds in great abundance late in November, 1930, on all the keys from Key Largo to Key West. Scott (1890e, p. 310) reports a few present on the Tortugas during most of the year, but no evidence of breeding. Bartsch noted single birds there, May 13, 14, and 21, 1922.

QUAILS: Family Perdicidae

EASTERN BOB-WHITE: *Colinus virginiânus virginiânus* (Linnaeus)

Other Names: **Quail; Partridge**

Recognition Marks.—Length, 9.5 to 10.5 inches; spread, 14 to 16 inches; bill very short and stout; neck short; body stocky; wings short and broad; general color mikado brown (reddish brown), varied with black; belly white or pale buff, with narrow fuscous crossbars; throat and head markings white in the male, cinnamon-buff in the female.

Range.—Resident in eastern North America from South Dakota, southern Minnesota, southern Ontario, and southwestern Maine south to northern and eastern Texas, southern Louisiana, southern Mississippi, and northern Florida; west to eastern Colorado.

Distribution in Florida.—Resident in the northern and northwestern parts, south to Gainesville and Palatka. Specimens have been examined from Milton, Marianna, Ocklockonee River, Arran, Panacea, St. Marks, Tallahassee, Fanlew, Hibernia, Jacksonville, and Palatka.

Haunts and Habits.—An intensive study of the habits of Quail has been carried on in Leon County, Florida, and Grady County, Georgia, by Herbert L. Stoddard under the direction of the United States Biological Survey. From Mr. Stoddard's second report (1926a) the following facts have been selected:

Of 104 nests examined, 12 were in woodland; 16 in fields fallow from one to five years; 48 in thin growths of broomsedge (older fallow fields); and 68 were sheltered in whole or in part by broomsedge. Sixty-six of the nests were built principally of broomsedge leaves, 9 chiefly of pine needles, and 22 of fine grasses, leaves of trees, Spanish moss, and miscellaneous materials. "In a study of 44 nests, no case was noted of a cock and hen alternating in the work of incubating the eggs. So far as could be ascertained, 15 (34 per cent) were entirely in charge of the cock and 29 (66 per cent) in charge of the hen." The average number of eggs to a nest (of 60 sets known to be complete) was 14, the largest set (deposited by more than one female) containing 24, and the smallest complete set 8, eggs. Quail nests in Leon County were found to be subject to many disasters from natural enemies and excessive rainfall.

Of the 104 nests studied, hatchings were successful in 43, and unsuccessful in 61, instances. In 20 nests all the eggs hatched. The principal enemies responsible for egg destruction were found to be skunks, cotton rats, opossums, house cats, dogs, and snakes. House cats catch Quail of all ages, including incubating birds. Two species of hawks, Cooper's Hawk and the Sharp-shin ("blue darters"), are very destructive to Quail.

The Bob-white is the most important of the upland game birds and probably is more generally sought by sportsmen in Florida than even the ducks. Numerous large preserves in northern Florida are given over almost entirely to the hunting of Quail by visiting sportsmen from the North, and the abundance of the birds in all parts of the State affords opportunities for thousands of local sportsmen to indulge their love of hunting.

FOOD.—Food studies conducted by the Biological Survey have shown the Quail to be highly beneficial to agriculture. Judd (1905, pp. 27–28) has summarized its food as follows:

> The food for the year as a whole, calculated by volume and determined by analysis of the contents of 918 stomachs, consisted of vegetable matter, 83.59 per cent, and animal matter, 16.41 per cent. . . . The vegetable part of the food consisted of grain, 17.38 per cent; various seeds, chiefly weeds, 52.83 per cent; fruit, 9.57 per cent; and miscellaneous vegetable matter, 3.81 per cent.

The insects eaten comprised beetles, grasshoppers, and bugs, including such pests as the army worm, tobacco worm, cotton worm, cotton-boll worm, potato beetle, cucumber beetle, squash beetle, and cutworms.

The winter food in northern Florida, as shown by a study of 302 stomachs (Stoddard, 1926a, p. 16), consisted of pine seeds (43.3 per cent); seeds of partridge pea (16.2 per cent); beggarweed (11.4 per cent); milk pea (6.3 per cent); bush clovers (1.6 per cent); sweet gum (1.9 per cent); sumac (1.6 per cent); ragweed (1.5 per cent); grasshoppers (2.9 per cent), and other items in smaller quantities.

FLORIDA BOB-WHITE: *Colínus virginiánus floridánus* (Coues)

OTHER NAMES: Quail; Partridge

RECOGNITION MARKS.—Slightly smaller than the northern race and colors darker, with *much more black*, especially on underparts, where the crossbars are wider and fuscous-black. (Plate 31.)

RANGE.—The Florida Peninsula, north to Gainesville and on the east coast to Anastasia Island. Specimens have been examined from Anastasia Island, Enterprise, Wilson, New Smyrna, Cedar Keys, Clearwater, Tarpon Springs, Fort Myers, Ritta, Rocky Lake (Hendry County), Miakka Lake, Fort Lauderdale, Miami, and Paradise Key (Royal Palm Hammock). Two specimens from Gainesville are intermediate between *floridanus* and *virginianus*, while three from Anastasia Island are typical *floridanus*, indicating a northward extension on the coast of this race.

HAUNTS AND HABITS.—The Florida Bob-white differs but little in habits from the Bob-whites of the Middle States, but it is perforce obliged to adapt itself to a different habitat. The birds range widely into a variety of situations, being equally numerous in sandy, open pineland, on the prairies among palmetto scrub, and about the borders of brushy hammocks. They push out to the borders of the marshes as far as the pineland extends and on to the Everglades where cultivated land has displaced the saw-grass marsh. We found them in the fields about Royal Palm Hammock (which lies in the southern Everglades), but they have not been seen on the Cape Sable prairies, which are separated by about 25 miles of everglade marsh and mangrove forest from the southern end of the east-coast pineland. In regions where they are not much hunted, we found them sur-

prisingly tame, in some cases (as on the prairies near Rocky Lake) refusing to fly even after one of their number had been shot.

The nests are constructed in the usual manner of the species, on the ground among dead grass or under a small saw palmetto bush, and are made of grasses, arched over to form a dome, with the entrance at the side. The eggs, usually from 11 to 15 in number, are laid in April, May, or June, those of second broods sometimes in July (San Mateo, May 4, 13, 18, 31, and July 26; Jacksonville, June 21; Orlando, May 20 and 24, 1917; Archer, May 25, 1887). Bendire (1892, p. 7) states, on the authority of J. F. Menge, that the birds nest in Lee County as early as February 15; Captain Menge once found 23 eggs in one nest. Scott (Bendire, *loc. cit.*) says they breed at Tarpon Springs in early April and raise two broods; he observed young birds but a few days old in the first week of July.

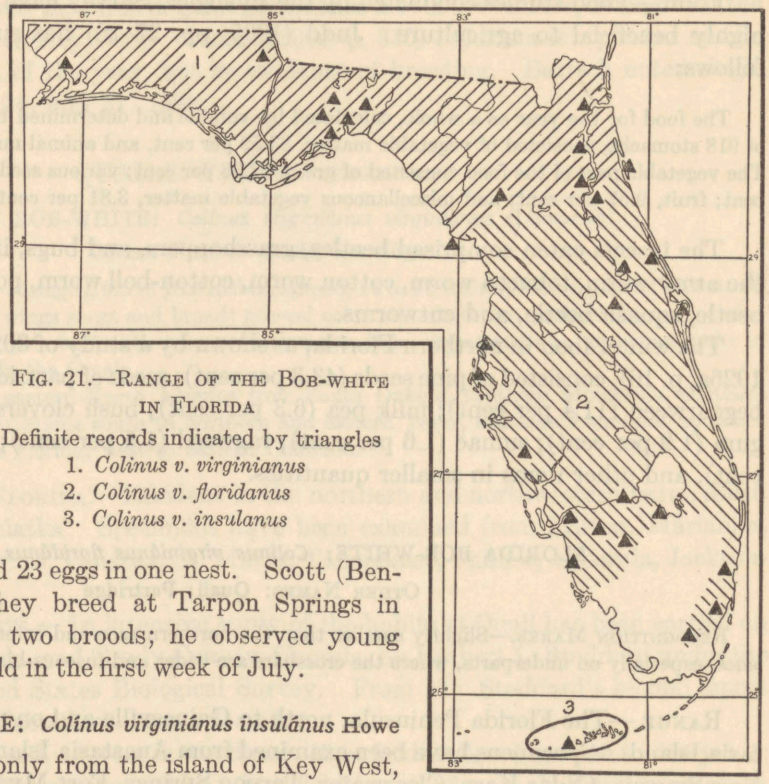


FIG. 21.—RANGE OF THE BOB-WHITE IN FLORIDA

Definite records indicated by triangles

1. *Colinus v. virginianus*
2. *Colinus v. floridanus*
3. *Colinus v. insulanus*

KEY WEST BOB-WHITE: ***Colínus virginiánus insulánus*** **Howe**

RANGE.—Known only from the island of Key West, Florida. This race was described by Howe (1904c, p. 168) from a single specimen taken by J. W. Atkins at Key West, July 5, 1888. This specimen had previously been recorded by W. E. D. Scott (1889a, p. 245) as *Colinus v. cubanensis*. It is now in the collection of the Museum of Comparative Zoölogy, and through the courtesy of the director I have been permitted to examine it. It is similar in color to the peninsular race (*floridanus*), but is less heavily marked with black on the underparts. The wing measures 99 millimeters, which is about 10 millimeters shorter than the average *floridanus*, but the bill is stouter than in that race.

The type is the only specimen of this subspecies known, and the race is probably now extinct. Mr. Atkins, who has lived at Key West for many years, stated (Scott, 1889a, p. 245) that Quail were almost unknown to the inhabitants of the island and that the only additional records of their occurrence there were of single birds seen May 11 and 22, 1888. In 1903, he said further (Howe, 1904c, p. 168) that none had been seen since 1888.

TURKEYS: Family Meleagrididae

FLORIDA TURKEY: *Meleágris gallopávo osceóla* Scott

Recognition Marks.—Smaller than the northern race (wing of male, 17 to 18 inches; of female, 14 to 16 inches); white bars on wing quills narrower and less extensive. (Plate 31.)

Range.—Florida, north at least to Gainesville and the lower Aucilla River. Turkeys are common in all sections of the State where suitable conditions exist. Specimens have been examined from Lake Harney, Lake Hatchineha, Sawgrass Island (Polk County), Illahaw, Fort Bassenger, Fort Thompson, Lake Trafford, Tarpon Springs, Fort Myers, Barnes River (12 miles east of Chokoloskee), Gainesville, and Aucilla River (near mouth). The specimens from the last two localities are intermediate between *osceola* and *silvestris*, but nearer to the former.

Although doubtless less numerous than in the days of the early settlement of the State, Turkeys are still abundant in many sections, and in some places are believed to be increasing. They were reported common in the Aucilla River swamps (1926), near Mayport (1917), Port Orange (1923), Chassahowitzka River (1920), Kissimmee (1917), Malabar (1923), Immokalee (1919), Rocky Lake, Hendry County (1919), Deep Lake (1919), Everglade (1919), and Carnestown (1928). They are particularly numerous on the prairies and in the cypress swamps of Hendry and Collier Counties on the western side of the Everglades. One individual has been reported from the Royal Palm Hammock, which, so far as known, is about their southern limit. A nest containing 7 fresh eggs was found at Lloyd, Jefferson County, April 13, 1905. At St. Marks, June 22, 1916, Pennock saw 2 or 3 hens with a flock of about 40 young scarcely able to fly, and on May 30, 1917, he observed 2 hens with about 25 young able to fly. Stoddard noted two broods of young, numbering about 20, near Lake Iamonia, May 24, 1927.

Haunts and Habits.—The Florida Turkey lives chiefly in and about the dense hammocks and the dryer swamps, but the birds are found, also, in open pineland and on the prairies where there are tracts of saw palmetto scrub affording cover. When pursued they take refuge in a thicket or a clump of palmetto or fly to the nearest timber. The birds are usually found in small flocks or in companies of two or three. They roost near the top of a tall pine or in a cypress in the midst of a small swamp.

Dr. W. L. Ralph, who had considerable experience with the Florida Turkey, wrote of it as follows (in Bendire, 1892b, p. 114):

> These birds are polygamous, and the female takes all the care and duties of incubation upon herself. The gobblers are pugnacious, and will often fight fiercely for the favors of the hens. The love season begins in Florida about the middle of February and lasts for about three months, and during this period the gobblers frequently utter their call and are then easily decoyed within gunshot. Native hunters have informed me that the hens roost by themselves at this season of the year.
>
> The nest is a slight depression in the ground, either at the foot of a tree or under a thick bush or saw palmetto. It is lined sparingly with dead leaves and grass, etc., but I could never find out whether this material was placed there by the birds or was there originally. I think these birds raise but one brood a season, though I have found fresh eggs as early as the middle of March and as late as the 1st of May. I have never found more than thirteen eggs in one nest, nor less than eight, unless they were fresh, the usual number being ten.

Doctor Ralph states that formerly (about 1875) the Florida Turkeys were rather stupid birds, being easily approached. He tells of running a small steamer within 20 yards of a flock, which did not take wing until several shots had been fired at them. At present they are rather wary and suspicious of a person on foot, but they have not learned to fear an automobile and are often shot by hunters driving through the woods in a car.

Scott (1893, p. 6) gives the weights of Florida Turkeys as follows: Males, 12 to 22 pounds, average, 16 pounds; females, 4¾ to 9½ pounds.

Food.—The stomach and crop of a specimen killed on the Aucilla River in January contained a quantity of acorns (65 per cent); 172 wax-myrtle berries; 79 seeds of hornbeam (*Carpinus caroliniana*); 63 seeds of poison ivy (*Rhus radicans*); 18 seeds of supplejack (*Berchemia scandens*); and insect remains amounting to 3 per cent of the total food.

A bird collected at Holopaw in April had eaten 77 seeds of the black gum (*Nyssa biflora*); 33 seeds of greenbrier (*Smilax*); 65 seeds of blue-eyed grass (*Sisyrinchium*); 625 seeds of rush-grass (*Sporobolus*); a quantity of huckleberries (5 per cent of the total food); a small snake (*Natrix*); and a few insects and spiders.

CRANES: Family Gruidae

WHOOPING CRANE: *Grus americâna* (Linnaeus)

Other Name: Great White Crane

Recognition Marks.—Larger than the Florida Crane (length, 49 to 56 inches; spread, 76 to 92 inches). Entire plumage white, except for the primaries, which are fuscous-black; bare part of head carmine, sparsely sprinkled with black, hairlike feathers; a small patch of slate-gray on back of head and nape.

Range.—The Whooping Crane formerly bred from northern Mackenzie and Hudson Bay south to Illinois and Iowa; it is now probably restricted mainly to southern Mackenzie, and in migration to the Mississippi Valley region, wintering from Texas to central Mexico.

Distribution in Florida.—There are several published statements mentioning the occurrence of this species in Florida, all rather indefinite. Audubon confused the Whooping Crane with the Sandhill Crane, so his Florida records must be ignored. Nuttall (1834, p. 36) speaks of *hearing* the birds every morning early in March in western Florida, but gives no further details. Maynard (1881, p. 424) says: "Some years ago the late Capt. Dummitt assured me that the White Whooping Crane occurred on the prairies which lie to the eastward of the Kissimmee River and Lake Okeechobee, and this report has also been confirmed by others."

Definite evidence of the occurrence of this species in the State in former times is furnished by the finding of its bones in Pleistocene deposits at Melbourne, Seminole, and on the Itchtucknee River (Wetmore, 1931, p. 35).

Haunts and Habits.—Concerning the occurrence of this species in western Canada, Taverner (1926, p. 121) says: "The Whooping Crane is amongst the wariest of birds. It frequents the bare prairies and open sloughs where its great height from the ground gives it every opportunity to note approaching danger; yet from being a fairly common bird on the prairies it has been practically exterminated within the last thirty years."

Goss (Birds of Kansas, p. 132) writes of the bird's habits as follows:

In flight, their long necks and stilt-like legs are stretched out in line with the body to their full extent, moving strongly, with slowly-beating wings, but not swiftly; . . . often circling spiral-like to a great height. They occasionally bunch up, and I have seen them in a triangular form, but, as a rule, they travel in single file, following their leader in a wavy line, croaking as they go, like hounds upon a cold trail.

FLORIDA CRANE: *Grus canadénsis praténsis* Meyer

OTHER NAMES: Sandhill Crane; Sandhill Whooper; Whooper; Whooping Crane

RECOGNITION MARKS.—About the size of the Great Blue Heron (length, 40 to 48 inches; spread, about 80 inches; bill, 5 to 6 inches); forehead and crown bare, reddish; chin and throat white; rest of body mainly smoke gray, and back and scapulars often rather heavily overlaid with wood brown (light brown) or fuscous; primaries fuscous-black. (Plate 30.) Distinguished in flight from the Great Blue Heron or Ward's Heron by the jerky motion of the wings and by the outstretched neck.

RANGE.—Resident in peninsular Florida, north to the Okefenokee Swamp; possibly in southern Alabama and southern Louisiana.

DISTRIBUTION IN FLORIDA.—Originally this species was generally distributed in suitable situations throughout the State, though probably always most abundant in the prairie regions of central and southern Florida. At present it is rarely found in the northern or western parts of the State. Weston saw two birds flying over Pensacola, March 17, 1929. A colony, estimated to number about a dozen pairs, is reported to be living in a marsh about 6 miles west of Madison. A pair remained in the vicinity of St. Marks during the summer of 1895, and two birds were seen flying over there May 20, 1913, but there are no records since then for the region. G. C. Fisher (1910b, p. 45) recorded the species as common at Lake Wimico, in December, 1909, and Wayne (1895, p. 364) reported it breeding near Waukeenah. Baynard (1913a, p. 243) lists it as a rare breeder in Alachua County. It is said to be fairly common in southern Volusia County, west of Oak Hill. Nicholson reports it breeding every year in a marsh east of Winter Park, and in the Apopka Marsh near Lake Jem. It is common in the southern parts of Lake and Orange Counties, and from

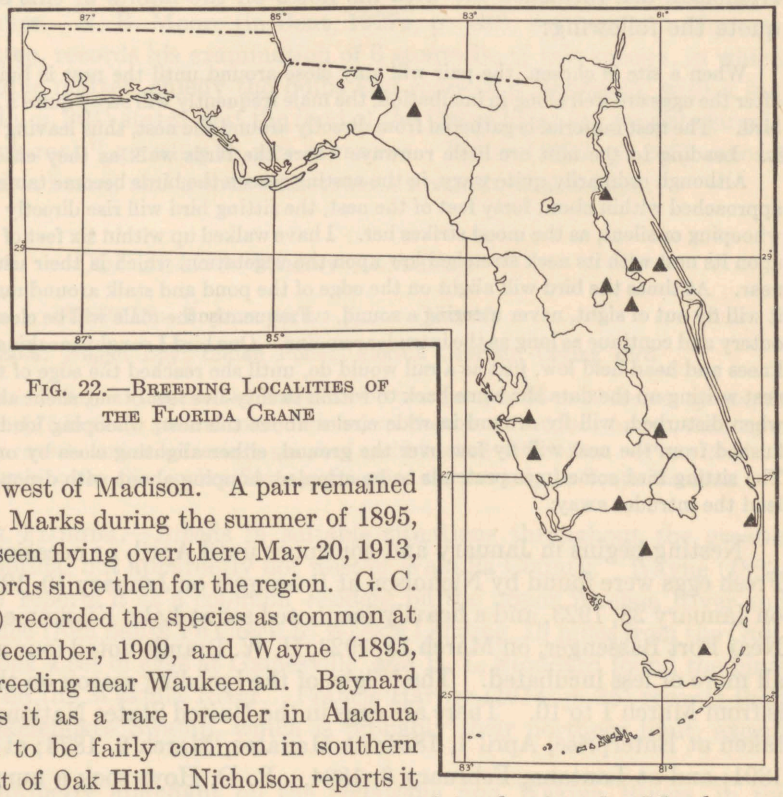


FIG. 22.—BREEDING LOCALITIES OF THE FLORIDA CRANE

there southward it is abundant in suitable situations, especially on the Kissimmee Prairie, the St. Johns River marshes, and the prairies of Glades, Hendry, and Collier Counties. On the Everglade prairies near the Royal Palm State Park, a pair was reported to be living in the spring of 1918. Capt. W. A. Roberts, of Flamingo, says that the birds breed near Pine Island, in Whitewater Bay.

HAUNTS AND HABITS.—The Florida Crane is a lover of the wet prairies, but is found to some extent in the pine flats and in open pine forests where there are small ponds in the hollows. The site chosen for a nest is almost always a shallow pond grown up to flags and other marsh vegetation, but occasionally a dry, or even a rocky, situation may be selected. The nests are bulky, often 3 to 5 feet in diameter and a foot or more high, and are built of grass and the dead stalks of flags or pondweed. There is no lining and not much depression for the eggs, usually two in number, sometimes only one. (Plate 33.)

D. J. Nicholson says that this bird occasionally builds on dry ground in pine flats, in which case the nest material is scanty, consisting of a few wisps of grass and a few dead palmetto leaves. He describes, also, a nest that he found on the dry prairie near Istokpoga Lake about a mile from the nearest water; this was in a patch of grass and short saw palmettoes, and was composed of sticks, grass, and pieces of palmetto leaves. Mr. Nicholson has furnished me with his notes on the habits of this species, from which I quote the following:

> When a site is chosen, the pair will stay close around until the nest is built and the eggs are laid; after the eggs are well along in incubation, the male frequently will stray quite a distance from the sitting bird. The nest material is gathered from directly around the nest, thus leaving a cleared place encircling it. Leading to the nest are little runways where the birds walk as they enter and leave it.
>
> Although ordinarily quite wary, in the nesting season the birds become tamer, and when a person has approached within about forty feet of the nest, the sitting bird will rise directly off the nest and fly away whooping or silent, as the mood strikes her. I have walked up within six feet of a sitting Crane crouched upon its nest with its neck stretched low upon the vegetation, which is their usual habit when danger is near. At times the bird will alight on the edge of the pond and stalk around making a great noise, again it will fly out of sight, never uttering a sound. Frequently the male will be close by and both join in the outcry and continue as long as the intruder remains. One bird I caught sneaking off the nest with bended knees and head held low, just as a rail would do, until she reached the edge of the pond; as I sat on the nest writing up the data she came back to within twenty-five feet of me, silent all the while. Some pairs, when disturbed, will fly around in wide circles above the nest, whooping loudly as they fly, but birds flushed from the nest will fly low over the ground, either alighting close by or flying quite a distance. The sitting bird sometimes pretends to be crippled, hopping about with drooping wings in an effort to lead the intruder away.

Nesting begins in January and continues until April, or occasionally as late as June. Fresh eggs were found by Nicholson at Bassenger on January 10, 1929, and near Orlando on January 28, 1923, and a heavily incubated set at Lake Kissimmee, February 25, 1923. Near Fort Bassenger, on March 15, 1923, H. W. Brandt noted four nests containing eggs, all more or less incubated. The height of the breeding season on the Kissimmee Prairie is from March 1 to 10. There are eggs in the United States National Museum that were taken at Enterprise, April 1, 1854; at Manatee, March 2, 1873; at San Mateo, April 8, 1891; and at Lantana, February 6, 1894. R. D. Hoyt took a number of sets in Green Swamp, Polk County, between the dates of February 13 and March 19.

The Florida Crane flies with slow, steady strokes of its big wings, and with a peculiar

jerky motion, which is characteristic. Usually the flight is performed rather near the ground—perhaps 50 to 100 feet. Occasionally the birds ascend to a great height, circling and soaring until almost lost to sight. Their ordinary notes are a loud, sonorous, rattling call suggesting the syllables *gur-roó, gur-roó,* the second syllable accented strongly and frequently prolonged. These calls are heard chiefly during the breeding season, and most frequently about sunrise and sunset, when at times a number of pairs may contribute to the inspiring chorus. The Cranes indulge in a dance at the time of mating, which Forbush (1925, vol. 1, p. 350) describes as follows:

> The birds usually assemble in some numbers on a knoll and dance about, skipping high in air and even flying up a little way from the ground occasionally, turning about, moving with high prancing steps and bowing repeatedly in all directions. Both males and females engage in the dance. At times a single pair may be seen so occupied and even a lone bird may take a few dance steps from time to time.

Food.—Examination of 7 stomachs of the Sandhill Crane in the Biological Survey indicated a preference on the part of the birds for a vegetable diet. Animal food in the contents amounted to only about 2.5 per cent, comprising carabid beetles, dragon-fly nymphs, caterpillars, ants, and crawfishes. Four birds from Florida had eaten chiefly tubers of a sedge (*Cyperus* sp.) and fine buds and rootlets of an unidentified plant, with a few seeds of saw grass. N. B. Moore (in Bent, 1927a, p. 246), writing from Manatee County many years ago, records his examination of 6 stomachs of this species, in which he found only vegetable matter, chiefly the bulbs and roots of a *Sagittaria,* with a few seeds. Bryant (1854a, p. 304) states that the food of the Crane in spring consists largely of a root called "pink-root," growing in wet savannas. Baker (1890, p. 268) reports finding a frog, a toad, a lizard, and a snake in stomachs examined at Micco.

COURLANS: Family Aramidae

LIMPKIN: *Aramus pictus pictus* (Meyer)

Other Names: Nigger Boy; Indian Pullet; Florida Courlan; Crying Bird

Recognition Marks.—Nearly as large as the American Bittern (length, 25 to 27 inches; spread, 40 to 42 inches; bill, 3.50 to 4.75 inches); general color dark brown (fuscous or mummy brown, shading to olive-brown on the wing coverts and secondaries), streaked and blotched with white. (Plate 20.)

Range.—Florida, north to the Okefenokee Swamp, Georgia, and casually to South Carolina.

Distribution in Florida.—Breeds in suitable situations throughout the greater part of peninsular Florida, but apparently not west of Wakulla County. Wayne (1893, p. 337; 1895, p. 366) reports it as a common resident on the upper Wacissa River and all along the Suwannee from Santa Fe Creek to Week's Landing, 15 miles from the Gulf. O. C. Van Hyning took a set of eggs at Gainesville, and H. L. Stoddard found the birds breeding commonly on the Wakulla River. Francis Harper (1914, p. 35) records their occurrence in the Okefenokee Swamp, which is probably their northern limit, except casually.

Limpkins were formerly abundant on the Oklawaha and Wekiva Rivers, in the Okaloacoochee Slough, and in many parts of the Everglades, particularly around the southwestern shore of Okeechobee Lake and on the eastern edge of the Glades, west of

Palm Beach, but at present they are comparatively scarce in those localities and entirely absent from the portion of the Everglades that has been drained. They are still numerous in the big marshes of the upper St. Johns River above Lake Washington; in the "Apopka Sawgrass"; in the Emeralda Marsh (between Lake Yale and Lake Griffin) on the Withlacoochee River, near Panasoffkee Lake; and in the Kissimmee Valley about Lake Hatchineha. Small numbers are reported to breed in a saw-grass marsh near the Chassahowitzka River, and on the glades near Royal Palm State Park. The bird has been observed on several of the Florida Keys and collected on the Tortugas.

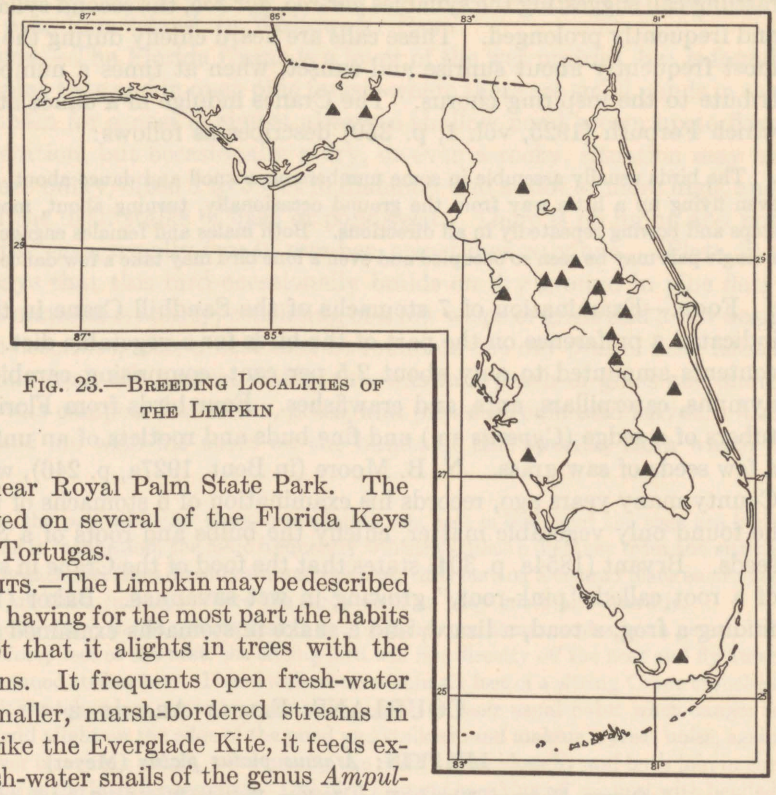


FIG. 23.—BREEDING LOCALITIES OF THE LIMPKIN

HAUNTS AND HABITS.—The Limpkin may be described as an overgrown rail, having for the most part the habits of those birds, except that it alights in trees with the same facility as herons. It frequents open fresh-water marshes and the smaller, marsh-bordered streams in timbered regions. Like the Everglade Kite, it feeds exclusively on large fresh-water snails of the genus *Ampullaria*, and is thus necessarily confined to a rather restricted habitat. It walks with a somewhat limping gait, lifting a foot high with each step, every few seconds twitching the tail with an upward jerk. Dr. Alexander Wetmore (in manuscript notes) thus describes the actions of the birds while feeding:

> The birds walked along with the neck bent forward and the head inclined toward the ground, but at short intervals stood quickly erect and gazed around. Most of their motions were quick and jerky, and on the whole were characteristic in nature. A large fresh-water snail (*Ampullaria depressa*) was abundant here, lying embedded in the mud. The Limpkins searched about, occasionally probing in the mud with their long bills. When a snail was located, it was quickly drawn out and held in the bill while the bird gazed around to make sure that the coast was clear. The snail was then seated firmly on the mud with the opening pointing upward, after which the Limpkin worked the mandibles down on either side of the operculum and with a quick twitch pulled it off. This done the bird raised its head quickly to make sure the coast was still clear and then pulled the snail out deftly and swallowed it. All through these open glades, at intervals of 10 to 50 feet, the remains of these meals were scattered. In each case the shell lay in position, undisturbed with the opening up, a few inches from the hole in the mud from which it had been taken, while the operculum lay a few inches away where it had fallen. The birds were very expert in working on these shells, as only occasionally did I see one that was chipped or broken. The two halves of the bill were separated by a slight aperture behind the point, giving the tips

of the mandibles a tweezer-like arrangement that was probably of assistance in the manner of feeding followed by these birds.

The Limpkin rises from the marsh with a quick spring and flies at a low altitude with slow, steady wing beats, the neck fully extended and the legs straight out behind. The flight is performed in a manner similar to that of the Sandhill Crane, with a quick, upward jerk of the wings. The note of the bird is very characteristic—a loud, mournful wail suggesting the cry of a child,[1] and is repeated indefinitely. Brewster (1881, p. 43) translates it into the syllables *kur-r-ee-ow, kur-r-ee-ow, kr-ow, kr-ow.* The birds are particularly noisy at night.

The nests of this species are of several types; in the open marsh, the nests are usually placed in the marsh vegetation (grass, flags, etc.) on top of the water or in clumps of saw grass, 2 or 3 feet above the water. Where the water is deeper, they are built in the bases of myrtle bushes a few inches above the water; and along the deeper streams in the timber they are usually in bushes or trees overhanging the water, 3 to 17 feet above the surface. (Plates 17 and 32.) Nicholson says that in the marshes, the nests are always located near an opening in the vegetation, where the sitting bird can have a wide outlook. Our guide informed us that in the Loxahatchee Marsh, in Palm Beach County, the nests were often placed in bunches of moss in the branches of small cypress trees standing in water. Another guide told me he had once found a nest in a cypress swamp, built on an air plant growing on the trunk of a tree, about 3 feet above the water.

Nesting ordinarily begins by the middle of February and continues through March and April. Our guide, Ike Lee, who has spent much time in the Everglades, told us that in former years, when the glades were covered with water, Limpkins began to nest in November and December and continued through the spring until May or June. In the big marshes near the head of the St. Johns River, northwest of Fellsmere, a nest with two eggs was observed December 28, 1926, and in the same marshes, between February 14 and 19, 1927, Henry Redding found about 30 nests containing both eggs and young birds. In the marshes, the nests are constructed of dead rushes piled up flat about a foot above the water; in bushes, they are built of sticks and lined sometimes with grass or Spanish moss. H. L. Stoddard noted a number of nests on the Wakulla River (April 23 to May 6, 1929) placed in myrtle bushes and tangled vegetation 12 to 17 feet above the water on the little islands around cypresses standing in shallow water. The nests were wide, nearly flat platforms of Spanish moss with sometimes a few green leaves, and each contained 4 eggs.

Describing the actions of a nesting bird observed at Wakulla Springs, H. L. Stoddard says: "The bird flew to a large horizontal limb about 100 feet away, where she went through one of the best imitations of a crippled bird I have ever seen. She flopped along the limb, sometimes letting her legs dangle on both sides of it, resting on her breast and belly, and beating her wings. This performance was kept up for fully 5 minutes." (Ms. notes.)

The Limpkin lays from 4 to 8 eggs, commonly 6 or 7; after hatching, the shells are left in the nest, and the young leave the nest the day they are hatched. The little fellows can swim as soon as they leave the shell, and if alarmed will scramble into the water and

[1] This explains the origin of the names "Crying Bird" and "Nigger Boy."

swim off, hiding in the grass. Nicholson, who reports this trait, has seen a flock of half-grown young swimming with their parent in the Kissimmee River.

RAILS, GALLINULES, AND COOTS: FAMILY RALLIDAE

KING RAIL: *Rállus élegans élegans* Audubon

OTHER NAMES: **Marsh Hen; Prairie Chicken; Fresh-water Marsh Hen**

RECOGNITION MARKS.—The largest of the Florida rails (length, 17 to 19 inches; spread, 21 to 25 inches; bill, 2 to 3 inches); breast and part of belly cinnamon; feathers of back and scapulars blackish brown, edged with buffy brown; *fore part of wing mainly russet;* a white line beneath eye. (Plate 34.)

RANGE.—Breeds from Nebraska, Minnesota, Ontario, New York, and Massachusetts south to Texas, Louisiana, and Florida. Occurs casually north to North Dakota and Maine.

DISTRIBUTION IN FLORIDA.—Breeds in suitable situations throughout the State; probably most numerous in the Everglades and on the big marshes of the upper St. Johns River. It is comparatively rare in northwestern Florida but has been reported from Pensacola (June 28, 1925, and April 15, 1926) and Whitfield (March 30, 1903). It is known to breed at Tallahassee, St. Marks, Waukeenah, Orange Lake, Orlando, Titusville, Melbourne, Seven Oaks (near Clearwater), Tarpon Springs, Plant City, Roseland, Larkin, and Royal Palm Hammock. Specimens have been examined from St. Marks, Punta Gorda, Lukens, Rosewood, Enterprise, Wilson, Tarpon Springs, Fort Thompson, Jupiter, Micco, West Palm Beach, Roseland, Royal Palm Hammock (12 miles south), and Key West. A series of these Florida specimens have been measured and compared with northern birds, but no constant differences have been detected.

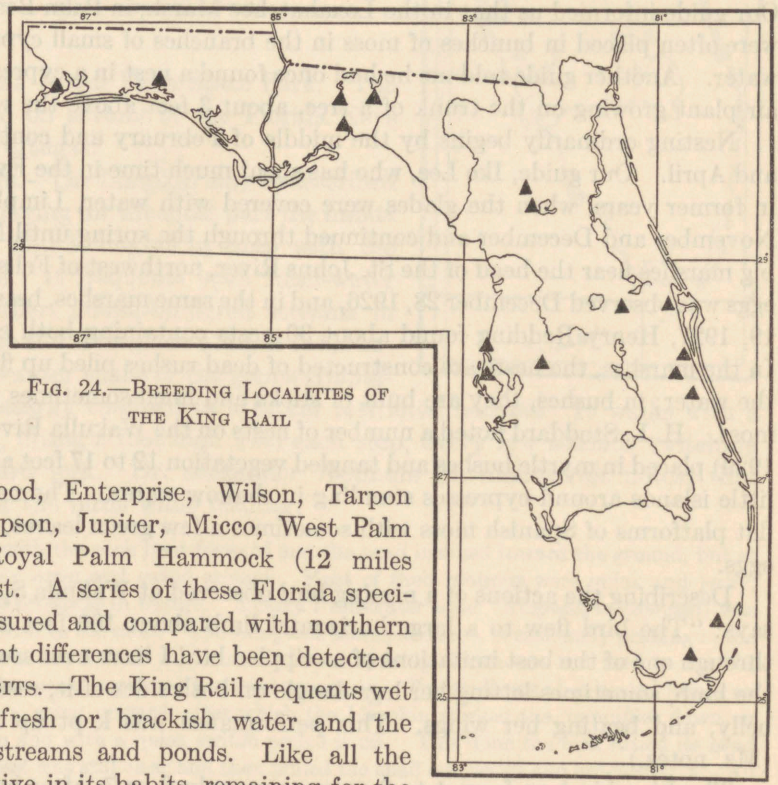


FIG. 24.—BREEDING LOCALITIES OF THE KING RAIL

HAUNTS AND HABITS.—The King Rail frequents wet marshes, chiefly in fresh or brackish water and the marshy borders of streams and ponds. Like all the rails, it is very secretive in its habits, remaining for the most part within the shelter of the marsh vegetation where it makes its home, and when flushed from its retreats, flies but a short distance before dropping again into the grass or rushes. On several occasions, however, in the southern Everglades, I

PLATE 31

EXPLANATION OF PLATE 31

BIRDS OF THE PRAIRIE BORDERS

Where the prairies merge into the open pine lands the birds shown in this scene are frequently found, though all occur also in other types of habitat. The flying birds in the center are female (left) and male Mourning Doves; at the lower left (flying) is a Ground Dove; in the foreground is a pair of Florida Turkeys and a pair of Florida Bob-whites, male (left) and female.

have observed the birds feeding and running about on the rock roads that cross the marshes.

The nests are built among marsh grass or rushes, the bottom usually resting in water; and are composed of dead rushes or grasses built up to a height of 8 or 10 inches. Nesting begins in March or the first half of April. The eggs are usually from 6 to 12 in number. Bent (1927a, p. 260) recorded a set of fresh eggs found near Plant City, March 30, 1925, and Pennock noted a half-grown young bird at St. Marks, May 26, 1917. Nicholson found a nest with four incubated eggs at Orlando, June 24, 1918, and caught a young bird about 10 days old near by; W. B. Grange observed a King Rail sitting on a nest of 12 eggs in Lake Miccosukee, June 19, 1926. The downy young, coal black in color, run about as soon as they are hatched. D. J. Nicholson picked up a dead specimen at Orlando, February 16, 1925, containing an egg nearly ready to lay. This indicates an early beginning of the breeding season.

The note of the King Rail is a loud cackling call, suggesting the syllables *geck-geck-geck* rapidly repeated and often prolonged for 5 seconds or more.

Food.—The stomach of a bird taken in the Everglades near Cape Sable contained the remains of 3 small crabs (*Rhithropanopeus harrisii*), 1 small fish, 1 frog, 1 gastropod mollusk, 2 diving beetles, 1 weevil, and several ants. Five stomachs examined by C. S. Brimley (1888, p. 16) in North Carolina contained crawfishes. Potter (Auk, vol. 45, p. 94, 1920) records an instance of a King Rail in New Jersey killing and devouring a blue crab. Kumlien and Hollister (1903, p. 38) state: "We have found the oesophagus literally crammed with oats, and in the latter part of the summer and early fall the birds subsist largely on grasshoppers."

FLORIDA CLAPPER RAIL: *Rállus longiróstris scótti* Sennett

Recognition Marks.—Slightly smaller than the King Rail (length, 12 to 14 inches; spread, 18 to 20 inches); similar in color to that species, but darker and more olivaceous (less reddish); *wing coverts olive-brown or buffy brown;* upperparts blackish brown, shaded with grayish olive; breast cinnamon, shaded with olive-brown.

Range.—Coast marshes of Florida, from Pensacola south to Cape Sable and on the east coast north to Jupiter; very abundant on the middle west coast from Charlotte Harbor to Apalachicola Bay; less numerous from the latter point westward. The birds from the northwest coast, St. Marks to Pensacola, are intermediate in characters between *scotti* and *saturatus* but nearer to *scotti*. Specimens have been examined from Pensacola, Westbay, Goose Creek (Wakulla County), St. Marks, Horseshoe Point (Dixie County), Suwannee River, Chassahowitzka Bay, Port Richey, Charlotte Harbor, Fort Myers, Flamingo, West Palm Beach (10 miles north), and Jupiter (breeding specimen). The species is common on Anclote Key and is reported from Fakahatchee Bay.

Haunts and Habits.—Clapper Rails are confined exclusively to salt or brackish marshes on or near the sea coast; at the mouths of the larger rivers, they occupy marshes several miles from the mouth of the river, but still within reach of the tides. The marshes inhabited by this race are occupied almost wholly by a very dense growth of a tall, sharp-pointed rush (*Juncus*). Underneath this dense and often matted growth the birds thread their way with apparent ease and in perfect safety from their enemies. Frequently,

however, especially at low tide, they come out of the marsh and walk or run along the edge of the mud flats in search of food, and occasionally one flies across a narrow channel to another part of the marsh. When feeding, the birds crouch rather low, with the head drawn in, and run about in a zigzag fashion. It is almost impossible to flush them from the dense jungles they inhabit. Their presence is evidenced, however, by frequent loud cackling notes that sound like derisive laughter at the helplessness of the hunter.

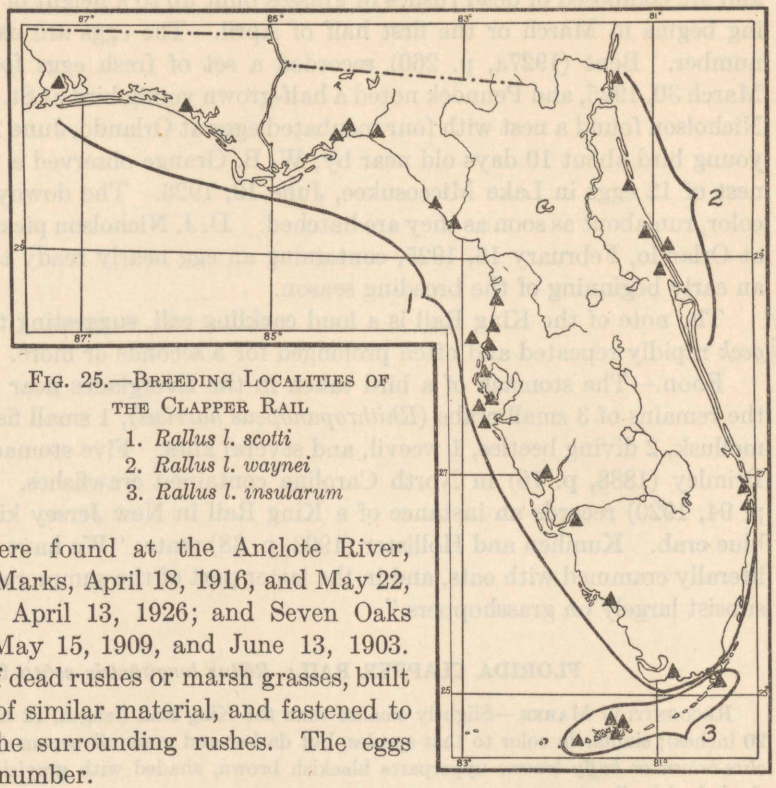


FIG. 25.—BREEDING LOCALITIES OF THE CLAPPER RAIL

1. *Rallus l. scotti*
2. *Rallus l. waynei*
3. *Rallus l. insularum*

The nesting season begins in March and continues into June; fresh eggs were found at the Anclote River, March 31, 1897; St. Marks, April 18, 1916, and May 22, 1913; Punta Gorda, April 13, 1926; and Seven Oaks (Old Tampa Bay), May 15, 1909, and June 13, 1903. The nests are made of dead rushes or marsh grasses, built up on a foundation of similar material, and fastened to and supported by the surrounding rushes. The eggs range from 6 to 9 in number.

FOOD.—Examination of 8 stomachs of this rail taken in western Florida in spring showed its food to be chiefly of animal origin (96 per cent), comprising crabs (*Sesarma reticulatum* and *Callinectes sapidus*); fiddlers (*Uca pugnax*); shrimps (*Palaemonetes exilipes*); mollusks; beetles; earwigs (*Anisolabis maritima*); and cocoons of butterflies.

WAYNE'S CLAPPER RAIL: *Rállus longiróstris wáynei* Brewster

RECOGNITION MARKS.—About the size of *Rallus l. scotti*, but general tone of upperparts more grayish, and breast paler. (Plate 23.)

RANGE.—Salt marshes of the south Atlantic coast, from North Carolina to central Florida.

DISTRIBUTION IN FLORIDA.—Resident in the salt marshes along the northeast coast from Amelia Island to Merritt Island. Specimens have been examined from Amelia Island, Matanzas Inlet, New Smyrna, Dummitt Creek, and Jupiter. Apparently, therefore, its range overlaps that of *scotti*, which also has been taken at Jupiter, in breeding condition. The single specimen of *waynei* from there, taken in April, 1920 (Mus. Comp. Zool. No. 82590), may have been a migrant. Additional material from points

between Merritt Island and Palm Beach is needed to define with precision the ranges of these two forms.

HAUNTS AND HABITS.—The habits of this race are practically the same as those of the west coast race (*scotti*). The breeding season begins in April and reaches its height about the last week of that month. On April 26, 1930, Wray Nicholson and J. C. Howell, Jr., noted 19 nests in Volusia County, the sets varying from 4 to 10 eggs. S. R. Ingersoll reports seeing young birds running around at New Smyrna on May 12, 1923. The birds must lay two or more clutches, for on July 18, 1926, D. J. Nicholson found 3 sets, two of 7, and one of 9, eggs. Two of these nests were built in the lower branches of small mangrove bushes, and the third was in a dense growth of *Salicornia* surrounded by mangrove trees. On June 12, 1927, at the same locality, Nicholson collected sets of 9, 8, 7, and 6 eggs. One of the nests he describes as "a genuine tree nest, built on a low horizontal branch of a mangrove tree, one foot from the ground, shielded by overhanging branches." While photographing a nest in which the eggs were on the point of hatching, Nicholson (1927c, p. 368) found the parent birds very bold in defense of their young, uttering low clicking sounds apparently made by snapping the bill.

FOOD.—The food of this Rail, as shown by examination of 22 stomachs taken at all seasons, consists almost entirely of animal matter; crabs of several species [1] furnished the greater part, and mollusks [2] were next in abundance. Grasshoppers and other insects and marine worms formed a small proportion of the food.

NORTHERN CLAPPER RAIL: *Rállus longirόstris crépitans* Gmelin

OTHER NAMES: **Mud Hen; Salt-marsh Hen**

RECOGNITION MARKS.—Similar to Wayne's Clapper Rail, but colors paler and slightly more brownish.

RANGE.—Breeds in salt marshes of the Atlantic coast, from Connecticut to southern Virginia; of casual occurrence north to southern Maine. Winters south to the Carolinas and Florida.

DISTRIBUTION IN FLORIDA.—A rare winter visitor; known at present from only two specimens taken on Amelia Island, January 11 and September 6, 1906 (Dwight collection).

MANGROVE CLAPPER RAIL: *Rállus longirόstris insulárum* Brooks

RECOGNITION MARKS.—Similar to *waynei*, but feathers of upperparts more broadly edged with grayish; sides of head beneath and behind eye light neutral gray, and sides of neck and breast washed with the same.

RANGE.—Apparently confined to the Florida Keys. Specimens are recorded from Big Pine Key (type locality), Boca Grande, Raccoon Key, Torch Key, Key Largo, and Key West. Fowler (1906, p. 398) reports the species from Riding Key and West Cudjoe's Key.

HAUNTS AND HABITS.—Little is known about the habits of this subspecies except that it dwells in the mangrove swamps. Fowler noted young birds on Riding Key, June 26, 1904.

[1] *Sesarma ricordi, Callinectes sapidus, Panopeus herbstii, Neopanope packardii, Rhithropanopeus harrisii, Uca pugnax rapax.*

[2] *Littorina irrorata, Ilyanassa obsoleta.*

VIRGINIA RAIL: *Rállus limícola limícola* Vieillot

RECOGNITION MARKS.—About the size of the Meadowlark (length, 8.5 to 10.5 inches; spread, 13 to 14.5 inches; bill, 1.25 to 1.65 inches); much like the King Rail in markings, but darker, with less white on throat; *sides of head deep mouse gray; wing coverts deep russet.*

RANGE.—Breeds from British Columbia, Saskatchewan, Manitoba, Ontario, southern Quebec, and New Brunswick south to northern Lower California, Utah, Colorado, Nebraska, Kentucky, and North Carolina; also in Toluca Valley, Mexico. Winters from southern British Columbia, Utah, Colorado, Arkansas, and North Carolina (casually as far north as Massachusetts) south to Lower California, Guatemala, and the Gulf coast from Texas to Florida.

DISTRIBUTION IN FLORIDA.—Occurs as an uncommon winter visitant in the northern half of the State. A dead bird was found in a marsh at Coronado Beach, October 18, 1910, shortly after a hurricane, and two were shot and others seen at Orlando on the 19th of the same month. The species was also reported from Orlando, January 28, February 1, and December 9, 1916, and January 24 and February 6, 1917. Specimens were taken at Cedar Keys, December 18, 1905; Lukens, January 17, 1908; St. Marks, January 26, 1914; Pensacola, October 27, 1928; and Daytona Beach, December 2, 1926. This Rail has been recorded also from Leon County (R. W. Williams, 1904, p. 452); Goose Creek, Wakulla County (January 6, 1920); Tarpon Springs (Scott, 1889a, p. 155); Sanibel Island (January 27, February 9, and March 19, 1923); Titusville (February 9, 1905); and Fort Myers (December 29, 1891).

HAUNTS AND HABITS.—In its summer home in the North, the Virginia Rail is partial to fresh-water marshes, but in the South, in winter, it may be found in either salt or fresh marshes. In migration it sometimes frequents grain fields or wet pastures. Like all the rails, it is secretive and rather shy, and rarely flies when it can escape by running through the dense marsh vegetation. It is swift of foot and is said to be a good climber, "scaling at times rushes, shrubs, vines, and even small vine-embowered trees in its search for seeds and berries, or in pursuit of insects, of which it destroys quantities" (Forbush, 1925, vol. 1, p. 357). Its notes are described as "a guttural *cut, cutta, cutta, cutta,* often repeated at brief intervals for hours in succession" (Brewster, in Chapman, 1895, p. 142).

SORA: *Porzâna carolína* (Linnaeus)

OTHER NAMES: Carolina Rail; Ortolan

RECOGNITION MARKS.—Slightly smaller than the Virginia Rail, *with shorter and thicker bill* (length, 7.85 to 9.75 inches; spread, 12 to 14.5 inches; bill, .67 to .90 inch). *Adult:* Upperparts Saccardo's umber (light sepia), marked with black patches and narrow white streaks; underparts neutral gray; *lores, chin, and a broad stripe on throat black; bill yellow. Immature:* Underparts mainly white; *no black on throat.*

RANGE.—Breeds in the northern United States and Canada, from Mackenzie and the Hudson Bay region south to northern Lower California, Utah, Colorado, Kansas, Missouri, Illinois, Ohio, and Pennsylvania. Winters in California; Lower California; the Gulf coasts of Texas, Louisiana, and Mississippi; Florida; Bahamas; West Indies; and south to Peru and Venezuela.

DISTRIBUTION IN FLORIDA.—Abundant in spring and fall migrations and fairly common in winter throughout the State. First arrivals from the North in fall were noted at St. Marks, August 29, 1916, and September 11, 1919; Pensacola, September 8, 1929;

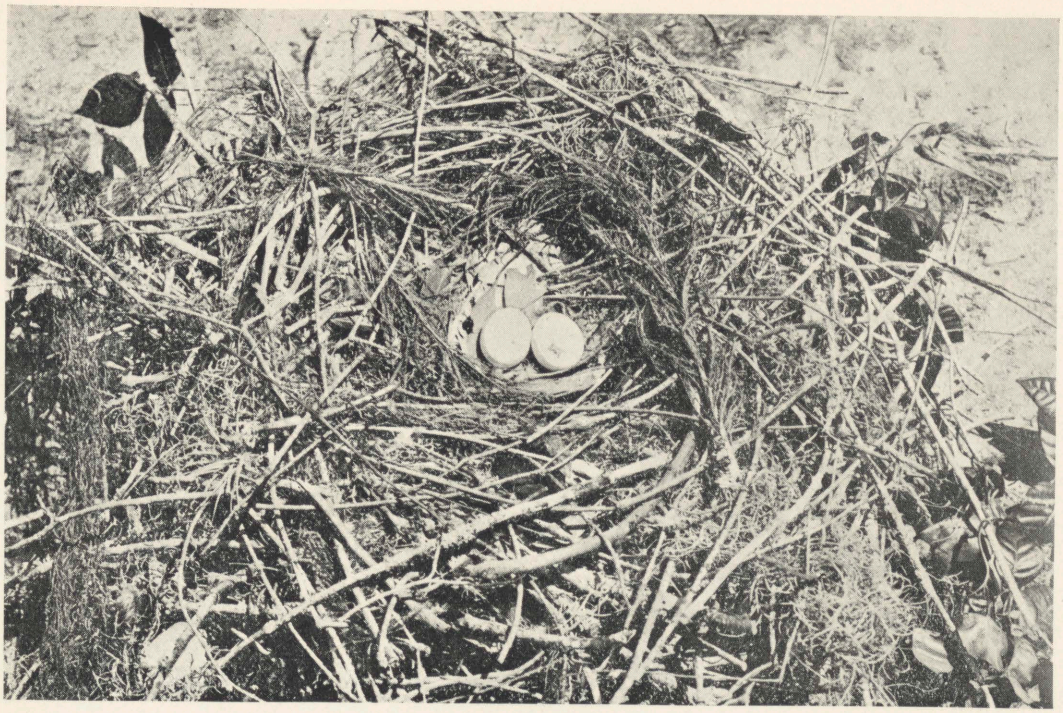


FIG 1.—NEST AND EGGS OF SHORT-TAILED HAWK AT ISTOKPOGA LAKE; REMOVED FROM POSITION AND PHOTOGRAPHED ON THE GROUND BY H. W. BRANDT

FIG. 2.—NEST AND EGGS OF LIMPKIN IN A CYPRESS TREE ON WAKULLA RIVER. (*Photo by H. L. Stoddard*)

FIG. 1.—NEST AND EGGS OF FLORIDA CRANE IN A POND ON THE KISSIMMEE PRAIRIE. (*Photo by E. G. Holt*)

FIG. 2.—FLORIDA BURROWING OWLS AT THEIR NEST BURROW ON THE KISSIMMEE PRAIRIE. (*Photo by E. G. Holt*)

Canaveral, September 16, 1889; Fernandina, September 17, 1906; Daytona Beach, September 23, 1925; and Sombrero Key Light, September 21, 1884. Specimens have been taken in winter at Amelia Island, December 28, 1905; the Chassahowitzka River, February 10, 1920; St. Marks, January 3, 1920; Royal Palm Hammock, January 19, 1918; and Cape Sable, February 14, 1918. Weston records the bird at Pensacola, January 24 and February 29, 1928. The last individuals seen in spring were reported at Sombrero Key Light, April 19, 1887; Whitfield, May 7, 1903; and Daytona Beach, May 26, 1925. Numbers struck Sombrero Key Lighthouse on March 11, 1889; April 19, 1887; September 21, 1884; September 29, 1888; October 9 and 10, 1885; October 14 and 16, 1887; October 31, 1886; November 6, 1891; and November 12, 1890.

HAUNTS AND HABITS.—The Sora favors fresh-water marshes but in migration is likely to be found in any sort of marsh or in overflowed meadows. It is less wary than most of the other rails and may often be observed at close range while feeding in the open spots on a marsh or boggy field. It flushes rather more readily than the other rails but flies weakly only a short distance, with legs dangling, before dropping into the grass again. It swims easily and can dive if necessary. Langille (1884, p. 441) describes the Sora's notes thus: "*queep-eep-ip-ip-ip-ip-ip-ip*, or *quaite, quaite, peep, peep, kuk-kuk-kuk* —the first two or three syllables in long-drawn, coaxing tones, and the remaining syllables shorter and more hurried . . ." This may be the same note that Chapman calls a "high-voiced, rolling *whinny*."

FOOD.—Of the 7 stomachs examined by King (1883, vol. 1, p. 602), 6 contained seeds; 2, snails; 2, beetles; 1, leaf hoppers; and 2, duckweed. Gibbs (1899, p. 153) says: "The Ortolon or Sora Rail feeds largely upon the small mollusks of the marsh. . . . Neuropterous insects, those belonging to the order in which the dragon fly is embraced, form a good share of their food." During their autumn migrations these birds feed extensively on the seeds of wild rice (*Zizania aquatica*) and at that season become excessively fat.

YELLOW RAIL: *Cotúrnicops noveboracénsis* (Gmelin)

RECOGNITION MARKS.—About the size of the Brown Thrasher (length, 6 to 7.75 inches; spread, 10 to 13 inches; bill about .5 inch); upperparts chestnut brown or black, streaked with pinkish buff; underparts dull white, shaded on breast with pinkish buff; a *white patch on secondaries* shows in flight.

RANGE.—Breeds from southern Mackenzie (Great Slave Lake), Hudson Bay, and Ungava south to Minnesota, Wisconsin, and Maine. Winters in the Gulf States (casually north to North Carolina and New York) and in California. Rare or casual in Oregon, Nevada, Colorado, Utah, and Arizona.

DISTRIBUTION IN FLORIDA.—Occurs rarely as a migrant or winter resident. Audubon (1838, vol. 4, pp. 251, 252) speaks of seeing several pairs on Sandy Key in May, 1832, and others at Silver Springs. Maynard (1881, p. 431) observed one on the St. Johns River, near Blue Spring, January 20, 1872. Cory (1896b, p. 267) mentions two birds killed on the St. Johns River marshes. A specimen in the Museum of Comparative Zoölogy was taken by Dr. Thomas Barbour in December, 1919, 6 miles west of Lake Worth. During a residence of several years at St. Marks, Pennock saw only a single individual, May 22, 1915.

HAUNTS AND HABITS.—The Yellow Rail, like the other members of its family, inhabits wet marshes, but is said to prefer the higher margins, and is sometimes found in

meadows or grain fields. It is difficult to flush, except when the water is high on the meadows where it is living. When surprised it flutters weakly for a few yards and drops again into the grass. Its notes have been described as *kik-kik, kik-kik-queah.*

BLACK RAIL: *Creciscus jamaicensis stoddardi* Coale

RECOGNITION MARKS.—About the size of a large sparrow (length, 5 to 6 inches; spread, 10.5 to 11.5 inches; bill very slender, about .5 inch). Head, throat, and breast deep neutral gray, becoming black on crown; nape and fore back bay; back Vandyke brown, *flecked with white.* (Plate 23.)

RANGE.—Breeds from southern Ontario, Minnesota, and Massachusetts south to Florida, and west to Iowa and Kansas. Winters in Guatemala and Jamaica, and probably in Florida, southern Georgia, and southern Louisiana.

DISTRIBUTION IN FLORIDA.—Occurs not uncommonly as a migrant, and breeds in several widely separated regions; probably occurs in many localities where its presence is unsuspected. Specimens have been taken at Pensacola, St. Marks, Little River (November 12, 1901), Key West (March 11, 1890), and on the Tortugas (several records, 1859 to 1861). Individuals struck the light at Mosquito Inlet, May 8, 1901, May 9, 1902, April 12, 1912, and October 7, 1923, and the light at Warrington, March 22 to 26, 1885. A migrant was taken on a vessel, off Pensacola, March 10, 1885.

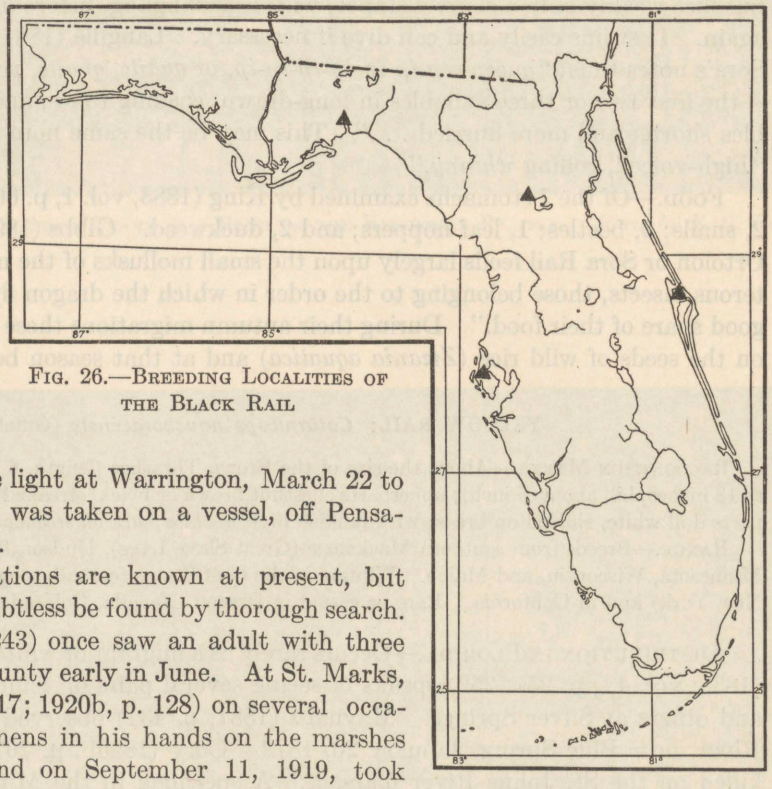


FIG. 26.—BREEDING LOCALITIES OF THE BLACK RAIL

Few breeding stations are known at present, but many others may doubtless be found by thorough search. Baynard (1913a, p. 243) once saw an adult with three young in Alachua County early in June. At St. Marks, Pennock (1919e, p. 117; 1920b, p. 128) on several occasions captured specimens in his hands on the marshes during high tides, and on September 11, 1919, took several young birds that were probably reared in the vicinity. W. B. Grange flushed an adult in the same locality on May 21, 1926. The first nests and eggs of this bird in Florida were discovered by D. J. Nicholson on Merritt Island in July, 1926, and in 1929 he found several more nests in the same locality. Charles E. Doe reports an adult and small young seen 6 miles east of Clearwater, May 11, 1927.

PLATE 34

EXPLANATION OF PLATE 34

BIRDS OF THE FRESH-WATER LAKES

In the numerous lakes in the interior of Florida is a flora similar to that of the St. Johns River marshes and many of the same kinds of birds occur commonly in both habitats.

The upper figure in the center is a Pied-billed Grebe; below it are two Coots and a Florida Gallinule; at the left is another Florida Gallinule and a Purple Gallinule; beneath them is a King Rail; at the right (swimming) is a Coot and beneath it a pair of Least Bitterns, female (left) and male, and a Green Heron.

F. L. JAQUES

HAUNTS AND HABITS.—This little Rail is apparently the most secretive and least known of its tribe. So averse is it to taking flight when disturbed in its home marsh that it is rarely seen by naturalists or hunters. It is a close sitter and there are numerous records of its being killed on the nest by scythe or mowing machine. It has been found breeding in both fresh and salt meadows, in a spot where the marsh grass is dense but not very tall. The nests found by Nicholson on Merritt Island were built in marsh grass among a sparse growth of *Salicornia*, in a rather open piece of marsh where the ground was damp, but without standing water. They were made of a handful of grass and were deeply cupped, with the growing grasses bent over them to form a canopy that completely hid the eggs.

In the Northern and Middle States, the breeding season extends from May to August, the eggs numbering from 6 to 10. In Florida, the birds have been found breeding in June, but probably they begin to nest much earlier than that. Nicholson noted two nests on Merritt Island, July 13, 1926, one containing 3, the other 6, fresh eggs. Ten days later, in the same marsh, he saw five more nests, two of which were believed to be second layings of birds whose eggs were taken on the 13th; and on July 29, another set of 4 eggs was obtained. On June 20, 1929, in the same locality, Nicholson found four nests of this bird, two of which appeared to be freshly built, the others containing bits of egg shells left after the young had gone. Wayne discovered a nest at Mount Pleasant, South Carolina, in an oat field on high ground. The notes of the birds owning this nest are thus described by him (1910, p. 39):

> As soon as she entered the standing oats she began to call, which notes resemble the words, *croo-croo-croo-o*, and then again almost exactly like the commencement of the song of the Yellow-billed Cuckoo. This was answered at once by the male, but his song was very different and the notes may best be described by the words *kik, kik, kik-kik*, or even *kuk-kuk-kuk-kuk*.

PURPLE GALLINULE: *Ionórnis martínica* (Linnaeus)

OTHER NAME: **Blue Pete**

RECOGNITION MARKS.—Length, 12 to 14 inches; spread, about 22 inches. *Adult:* Bill red, tipped with yellow; frontal shield blue; head and underparts purple; back and wings bluish green; legs and feet greenish yellow; under tail coverts white, *showing prominently in life as a white patch* when tail is elevated. *Immature:* Top of head sepia; throat white; breast pale buff; back greenish brown; rump clove brown. *Downy young:* Solid greenish black. (Plate 34.)

RANGE.—Breeds chiefly in Middle America, the West Indies, and South America (south to Argentina); in North America, north to South Carolina (casually to southern Virginia), southern Alabama, and southern Mississippi. Winters from Florida and the Gulf coast southward. Wanders north to Maine, New Brunswick, Nova Scotia, southern Ontario, and Wisconsin, and west to Nebraska, Colorado, Texas, and Arizona.

DISTRIBUTION IN FLORIDA.—Breeds abundantly throughout peninsular Florida west at least to Leon County, and probably less commonly in the northwestern counties. It retires in winter from the northern parts of the State, but winters in small numbers as far north at least as Gainesville. One was seen in the Halifax River, March 5, 1913 (Ingersoll), and others at St. Marks, March 16, 1918, and March 18, 1917 (Pennock). Weston reports migrants at Pensacola, April 13 and 14, 1916. Scott (1889a, p. 155)

says that during storms, usually in March, individuals have several times come aboard vessels 6 to 15 miles off shore in the Gulf.

Migration is indicated also by the capture of specimens on the Tortugas, April 14 and October 31, 1859, and by birds striking the lighthouse there on April 14, 1909, as well as the one at Mosquito Inlet, April 20, 1902, and at St. Augustine, October 9, 1902.

The birds breed in abundance in the lakes of Leon and Jefferson Counties; at Gainesville, Orange Lake, Lake Apopka, Lake Washington, and Lake Hicpochee; throughout the Kissimmee, St. Johns, and Caloosahatchee River systems; and in the Everglades. Audubon (1834, vol. 2, p. 316) mentions seeing this species on Sandy Key, near Cape Sable, in May, 1832. M. N. Gist, warden of the Orange Lake Reservation, estimates that more than a thousand pairs breed in that lake. Nearly all leave there in the fall, except a few immature birds.

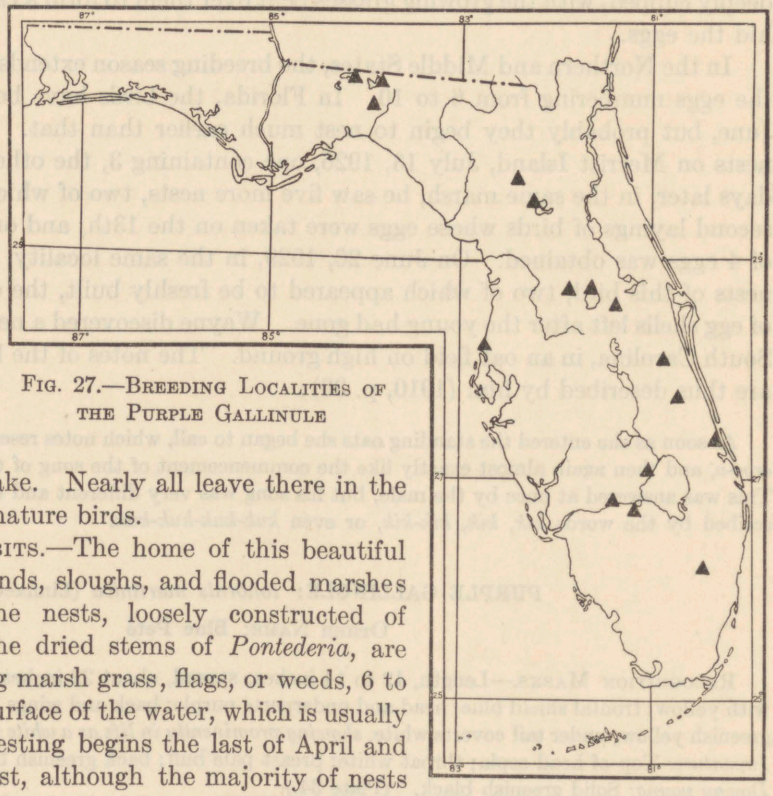


FIG. 27.—BREEDING LOCALITIES OF THE PURPLE GALLINULE

HAUNTS AND HABITS.—The home of this beautiful Gallinule is in the ponds, sloughs, and flooded marshes of the interior. The nests, loosely constructed of grasses, rushes, or the dried stems of *Pontederia*, are placed in the growing marsh grass, flags, or weeds, 6 to 12 inches above the surface of the water, which is usually 2 to 8 feet deep. Nesting begins the last of April and continues until August, although the majority of nests are found during the first half of June. The eggs range in number from 5 to 8, the most common clutch being 6, and incubation begins when the first egg is laid (Nicholson). If the nests are approached by a person wading, the birds usually flush at a distance and swim away, but under some circumstances they become tame enough to remain with their eggs. One that I watched in Lake Washington would remain on her nest as our motor boat passed within 6 feet of her, even with the motor running; on one occasion she slipped off the nest quietly and started in hot pursuit of a chicken snake, climbing into the bushes and attacking the snake vigorously until it made off. On Orange Lake, one of these Gallinules had a nest in a small bush close to the route followed daily by the warden in his motor boat; every time the boat passed the location of the nest the bird dashed threateningly at the intruder, cackling loudly.

Wayne (1910, p. 40), describing a colony of about 500 pairs nesting in an abandoned rice field in South Carolina, says:

> It was a very beautiful sight to observe the graceful creatures while walking over the large leaves of the pond lily, every now and then flirting their tails or holding their wings over their heads, as they walked from one leaf to another. When engaged in the sport of chasing one another while flying, the legs always hang down and the birds cackle continuously. They have very peculiar call notes. One, which is very guttural, is to be heard incessantly. The birds are exceedingly tame and one can almost step on them before they fly. If wounded, they dive immediately and remain under water for fully five minutes. It is folly to waste time in following them, as they rise with only the point of the bill out of the water.

Concerning the feeding habits of the birds, as observed on Lake Jackson, H. L. Stoddard states:

> As they stepped on a pad they would reach forward and grasp the far side with their beak and roll it back towards them, then place one foot on it to hold it, then pick off the insects or other food from the under side of the pad.

Food.—Seven stomachs of this species taken in Florida in the spring showed the bird to have a varied diet, consisting of animal matter, 42 per cent, and vegetable matter, 58 per cent. The animal matter comprised frogs, mollusks, water beetles, grasshoppers, weevils, leaf beetles, ants, bugs, dragon flies, and spiders. The vegetable food included seeds of the buttonbush (*Cephalanthus*), water willow (*Decodon verticillatus*), primrose willow (*Jussiaea*), saw grass (*Cladium effusum*), smartweed (*Polygonum*), sedges (*Cyperus* and *Carex*), yellow pond lily (*Nymphaea*), and pickerel weed (*Pontederia*).

FLORIDA GALLINULE: *Gallinúla chlóropus cachínnans* Bangs

Other Names: **Bonnet-walker; Pad-walker**

Recognition Marks.—Length, 12 to 15 inches; spread, 20 to 23 inches. *Adult: Frontal shield and most of bill scarlet,* the tip greenish yellow; head and throat slate-black, shading to deep neutral gray on foreback and underparts; back bone brown (blackish brown); wings fuscous; middle under tail coverts black, the outer ones white, showing in life as *two white patches.* (Plate 34.) *Immature:* Throat white; underparts more or less mixed with white; top of head brown. *Downy young:* Coal black.

Range.—Breeds from southern Quebec, Ontario, Michigan, Wisconsin, and Minnesota south over the greater part of eastern United States, Central America, and South America to Chile and Argentina; also in central California, and locally in Arizona. Winters from South Carolina, the Gulf coast, Arizona, and southern California southward.

Distribution in Florida.—Common at all seasons in suitable situations throughout the State; especially abundant in the lake region of central Florida. More than 1,000 pairs are estimated to nest in Orange Lake. The bird is known as a resident and breeder at De Funiak Springs, St. Marks, Lake Miccosukee, Waukeenah, Amelia Island, Gainesville, Apopka Lake, Seven Oaks, Cape Sable, and many other localities, and has been reported in winter at Amelia Island, Daytona Beach, Lake City, Titusville, the Chassahowitzka River, and along the Tamiami Trail near Miami.

Haunts and Habits.—The Florida Gallinule is more widely distributed than the Purple Gallinule, and is a more hardy bird, remaining throughout the winter even in northern Florida. It occupies the same habitat as its more brilliant relative, and the two species live together in harmony in the flooded marshes and ponds overgrown with

water lilies and other aquatic vegetation. In such situations the birds run nimbly over the lily pads or climb into the bushes overhanging the water in search of food. They are not nearly so secretive as the rails and may frequently be seen swimming in open water, their tails erect and heads bobbing back and forth at each stroke of the feet. When flushed, they fly rather clumsily, with legs dangling, and quickly drop again into the marsh. They are much given to conversation, having a variety of henlike *cucks* and squawks.

The nests are usually placed on floating tussocks or in clumps of saw grass or thickets of buttonbush standing in water. They are composed of the dead stems and leaves of pickerel weed or saw grass and are frequently arched over slightly. The eggs, 6 to 14 in number, are deposited in April or May (Gainesville, April 7 and 19; May 2, 1924).

Food.—The stomach of a bird taken in Alabama contained ground-up remains of hornwort (*Ceratophyllum*), fragments of univalves, and a few caddis-fly cases; one from Arkansas contained a quantity of grass and about 100 minute round seeds. King (1883, vol. 1, p. 603) says "of seven specimens examined six ate 42 snails; one, three water-scorpions; and two, other insects. Six ate seeds; four, duck-weed; and four, water-crowfoot."

AMERICAN COOT: *Fúlica americána americána* Gmelin

Other Names: **Mud Hen; Blue-pete; Crow Duck**

Recognition Marks.—About the size of a small duck (length, 13 to 16 inches; spread, 23 to 28 inches); bill like a Gallinule's, but *white*, with a spot of dark brown near the tip; frontal shield dark brown; head and neck black; upperparts and wings dark plumbeous; underparts deep neutral gray (paler in immature birds); white on ends of secondaries conspicuous in flight; *feet lobed.* (Plate 34.)

Range.—Breeds from central British Columbia, Great Slave Lake, and southern Quebec south to New Jersey, Ohio, western Tennessee, northern Arkansas, Texas, Arizona, Lower California, and south through Mexico to Guatemala; also in Porto Rico and Jamaica. It is absent during the breeding season in most of southeastern United States and New England. Winters in southern United States from southern Virginia (casually Massachusetts), southern Illinois, Texas, and Arizona southward, and on the Pacific coast from southern British Columbia southward.

Distribution in Florida.—Occurs as an abundant winter resident in all parts of the State, many birds remaining late in spring and a few throughout the summer; breeds sporadically in small numbers. Baynard (1913a, p. 243) states that he once found an occupied nest without eggs in Alachua County, and killed two females in June containing eggs "ready to lay in a week's time." M. N. Gist, warden of the Orange Lake Reservation, reported a few pairs nesting in the lake in 1915 and about 50 pairs in 1916; these were believed to be crippled birds. H. H. Bailey (1927c, p. 176) records a nest found on Merritt Island, May 11, 1927, and states that there are many places in Florida where the birds breed. W. S. Hanson reported some breeding on Lake Hicpochee in 1915.

Migrants from the North were noted arriving at St. Marks, September 13, 1917; De Funiak Springs, October 17, 1908; Fernandina, October 20, 1906; Pensacola, October 20, 1926, and October 18, 1929; and Tarpon Springs, October 23, 1886. Coots struck the Canaveral Lighthouse on October 12 and 25, November 18, 20, 21, and 23, 1905. The latest dates on which individuals were noted in spring are: Whitfield, April 28, 1903;

De Funiak Springs, May 2, 1908; Apalachicola, May 8, 1926; and St. Marks, June 6, 1915. At Panasoffkee Lake, June 2, 1925, I saw about 25 Coots, evidently not breeding.

During winter and spring Coots resort in large numbers to the fresh-water lakes and marshes of middle Florida, where they congregate in dense rafts or loose flocks in the shallower parts of the lakes among the pond lilies and other marsh vegetation. In February, 1917, Francis Harper estimated the Coots seen on Lake Apopka at 3,000 birds; on Orange Lake, at about 5,000; and on the western shore of Lake Okeechobee, near Moore Haven, at more than 20,000. Smaller numbers were seen by him in the St. Johns River near Green Cove Springs, in Lake George, and in the marshes on Merritt Island. In February, 1920, I saw a flock of more than a thousand birds in the Chassahowitzka River, and at Coot Bay, near Flamingo, in February, 1918, observed about 200 in a pond in a mangrove swamp. Coots were reported abundant on Matecumbe Key during the winter months (Brodhead, 1910, p. 190).

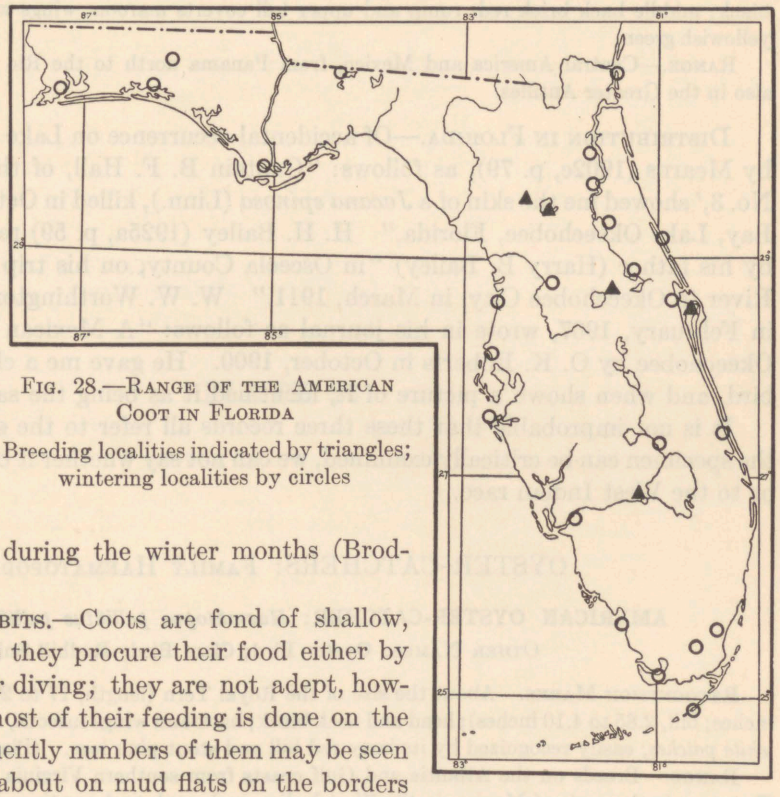


FIG. 28.—RANGE OF THE AMERICAN COOT IN FLORIDA

Breeding localities indicated by triangles; wintering localities by circles

HAUNTS AND HABITS.—Coots are fond of shallow, marshy ponds, where they procure their food either by wading, "tipping," or diving; they are not adept, however, at diving and most of their feeding is done on the surface. Not infrequently numbers of them may be seen standing or walking about on mud flats on the borders of a stream or pond. They are highly gregarious and very noisy and "talkative," their notes consisting of a variety of whistles, chuckles, and squawks. Their flight is rather slow and feeble, and being quite unsuspicious they offer an easy mark to the amateur gunner. In rising from the water they are usually compelled to paddle with their feet until they get a start in the air, after which they make fair headway, with the feet straight out behind.

FOOD.—Although Coots are not greatly prized for food or sport, their flesh is said by many to be of good quality, almost equal when feeding on wild celery to that of the best ducks. Bent (1927a, p. 362) says:

> The coot is quite omnivorous, living on a varied bill of fare at different seasons. . . . It feeds largely on the leaves, fronds, seeds, and roots of aquatic vegetation, such as pond weed (*Potamogeton*), the tops

of water milfoil (*Myriophyllum*), and the seeds of bur-reed (*Sparganium*). . . . It is very fond of wild celery, some of which it steals from the canvasbacks and other ducks. . . . Its animal food includes some small fishes, tadpoles, snails, worms, water bugs, and other insects, and their aquatic larvae.

JACANAS: Family Jacanidae

JACANA: *Jacâna spinôsa* (Linnaeus)

Recognition Marks.—Larger than the Virginia Rail with *very long legs and toes; forehead with a large leaflike yellow lobe;* bill ploverlike (about 1.25 inches). Head, neck, breast, and fore back greenish black; middle back brick red; rump and upper tail coverts maroon; wings with a large patch of light yellowish green.

Range.—Central America and Mexico, from Panama north to the Rio Grande Valley in Texas; also in the Greater Antilles.

Distribution in Florida.—Of accidental occurrence on Lake Okeechobee; recorded by Mearns (1902c, p. 79), as follows: "Captain B. F. Hall, of the steamboat 'Naoma No. 3,' showed me the skin of a *Jacana spinosa* (Linn.), killed in October, 1899, on Pelican Bay, Lake Okeechobee, Florida." H. H. Bailey (1925a, p. 59) reports a specimen seen by his father (Harry B. Bailey) "in Osceola County, on his trip down the Kissimmee River to Okeechobee City, in March, 1911." W. W. Worthington, while at Bassenger, in February, 1907, wrote in his journal as follows: "A Mexican Jacana was taken at Okeechobee by O. K. Roberts in October, 1900. He gave me a clear description of the bird, and when shown a picture of it, identified it as being the same bird."

It is not improbable that these three records all refer to the same individual; until the specimen can be critically examined, we can not say whether it belongs to the Mexican or to the West Indian race.

OYSTER-CATCHERS: Family Haematopodidae

AMERICAN OYSTER-CATCHER: *Haemâtopus palliâtus palliâtus* Temminck

Other Names: Oyster Bird; Clam Bird; Redbill Snipe

Recognition Marks.—About the size of the Royal Tern (length, 17 to 21 inches; spread, 30 to 36 inches; bill, 2.85 to 4.10 inches); head and neck black; back and wings fuscous, the latter *with conspicuous white patches;* easily recognized by its large red bill and stout pink legs. (Plate 35.)

Range.—Breeds on the Atlantic and Gulf coasts from southern Virginia (formerly New Jersey) to Texas, on both coasts of Mexico, in the West Indies, and south to Argentina and central Chile; of casual occurrence north to Massachusetts, New Brunswick, and Nova Scotia.

Distribution in Florida.—Formerly a common resident, breeding on all coasts; now rare and local. Maynard (1881, p. 366) found large flocks of these birds on the marshes back of Amelia Island, probably about 1872. According to Mrs. F. W. Sams, Oyster-catchers formerly nested on certain islands in Mosquito Lagoon, east of the Haulover Canal. Scott (1889a, p. 160) reported them abundant and breeding in May, 1886, on the outer keys at Charlotte Harbor. He mentions their occurrence also at Old Tampa Bay and Punta Rassa. In another paper (1881, p. 18) he records them breeding commonly at Clearwater and occurring commonly during December and January at the mouth of the Withlacoochee River. At present the birds are rare on both coasts. One was taken at

PLATE 35

EXPLANATION OF PLATE 35

BIRDS OF THE SEA BEACHES

The upper figures at the right are an Oyster-catcher and a Wilson's Plover. The lower figures from left to right are: Snowy Plover, Piping Plover, Semipalmated Plover, and Wilson's Plover.

PLATE 35

Boca Grande in June, 1901. Several were seen at Passage Key, December 22, 1911, one on Talbot Island, May 12, 1923, and several at Pass-a-Grille, November 18, 1924, February 7, 1925, and April 13, 1927.

During a residence of 11 years at Pensacola, Weston has seen but one Oyster-catcher—on the western end of Santa Rosa Island, May 18, 1919. Pennock likewise reports only one lone bird seen, near St. Marks, late in the spring of 1913. On St. George Island, May 9, 1926, we found two pairs, evidently intending to breed. Francis Harper noted two birds on Talbot Island, January 21, 1917; and in May, 1923, H. N. Vars saw about a dozen on Amelia and Talbot Islands. R. C. Hallman (1929d, p. 24) mentions a nest found on Bird Island, St. Johns County, May 16, 1929. S. R. Ingersoll recorded single birds seen on the beach near New Smyrna, October 8, 1922, and April 10, 1923; Longstreet observed one at Daytona Beach, October 8, 1923; and Pacetti reported two at Ponce Park, October 1 to 12, 1912, and five on Conch Bar in Hobe Sound, April 25, 1925. Specimens were taken at Key West, November, 1870, and at Cape Sable, May 3, 1885.

HAUNTS AND HABITS.—The Oyster-catcher frequents the ocean beaches and the oyster reefs in the coastal bays. During the winter the birds sometimes gather into flocks, but in the breeding season they scatter out and usually only a few pairs are found on the same beach. The nests are mere hollows scratched in the sand or among shells near high water mark. The eggs, usually 2 or 3 in number, are deposited in April or May (St. Johns River, April 10, 1874; Clearwater, May 6; St. Augustine, May 17, 1931).

Oyster-catchers are usually very wary and difficult to approach. They run rapidly and fly with a strong steady flight. Their long red bill and striking black and white plumage render them easy of identification. Their alarm note is a single loud whistle. The birds are adept at opening the shells of the "raccoon oysters" growing on the reefs.

Concerning the feeding habits of this species, Audubon (1835, vol. 3, p. 181), says:

> I have seen it probe the sand to the full length of its bill, knock off limpets from the rocks on the coast of Labrador, using its weapon sideways and insinuating it between the rock and the shell like a chisel, seize the bodies of gaping oysters on what are called in the Southern States and the Floridas "Raccoon oyster beds," and at other times take up a "razor-handle" or solen, and lash it against the sands until the shell was broken and the contents swallowed. Now and then they seem to suck the sea-urchins, driving in the mouth, and introducing their bill by the aperture, without breaking the shell; again they are seen wading up to their bodies from one place to another, seizing on shrimps and other crustacea, and even swimming for a few yards, should this be necessary to enable them to remove from one bank to another without flying.

Maynard (1881, p. 366) describes the feeding habits of the Oyster-catcher on the coast of North Carolina, as follows:

> When the outgoing tide left the tops of the oyster bars exposed, they would come flying silently in, at first singly, then in pairs, while groups of a few would follow, until, at last, they would come in flocks of a dozen or more. They would alight among the oysters and when the bivalves gaped open, as is their habit when the water first leaves them, the birds would thrust in the point of their hard, flat bills, divide the ligament with which the shells are fastened together, then, having the helpless inhabitant at their mercy, would at once devour it. They were not long in making a meal, for specimens which I shot after they had been feeding a short time were so crammed that by simply holding a bird by the legs and shaking it gently the oysters would fall from its mouth.

FOOD.—Examination of the stomachs of 15 specimens from the South Atlantic and Gulf coasts showed the food to consist mainly of mollusks, including oysters, clams, and other bivalves, and a few gastropods. Three of the birds had eaten a few scarabaeid beetles (*Ligyrus gibbosus*), and one had taken a number of tiger-beetle larvae. Audubon mentions having found in their stomachs small crabs, fiddlers, and sea worms.

PLOVERS: FAMILY CHARADRIIDAE

PIPING PLOVER: *Charâdrius melódus* Ord

OTHER NAMES: **Pale Ringneck; Beach Bird; Beach Plover**

RECOGNITION MARKS.—About the size of the Semipalmated Plover and similarly marked, but *much paler above* (pale smoke gray); collar somewhat narrower, and in winter plumage nearly obsolete. Distinguished from Wilson's Plover by its *much smaller bill, orange-yellow at base.* (Plate 35.)

RANGE.—Breeds from southern Saskatchewan, southern Manitoba, southern Ontario, southern Quebec, and Nova Scotia south to central Nebraska, northwestern Indiana, northern Ohio, northwestern Pennsylvania, and North Carolina. Winters on the South Atlantic and Gulf coasts, from Georgia to Texas and northern Mexico.

DISTRIBUTION IN FLORIDA.—A moderately common migrant and winter resident. Migrants from the North were noted at New Smyrna, July 15, 1899, and August 5, 1924; Pensacola, July 27, 1929; Fernandina, August 3, 1906; Daytona Beach, August 10, 1914, and August 17, 1924, and on the Tortugas, August 14, 1925. Wintering birds have been recorded at Amelia Island, December 13, 1905; Mayport, January 22, 1917; Miami, January, 1871; Cape Sable, February 17, 1918 (7); on the Tortugas (specimen), March 27, 1890; on Captiva Island, January 2, 1926; at Pass-a-Grille, February 9, 1926; Pensacola, November 22, 1925, and February 27, 1927; and Cedar Keys, November 30, 1870. J. T. Nichols reports about 25 birds seen, April 9, 1917, on a beach 12 miles south of Sanibel Light. Fargo (1926, p. 148) records flocks of 20 to 50 near Pass-a-Grille in winter and spring. The last seen in spring were noted at Daytona Beach, May 1, 1927, and Peninsula Point (Franklin County), May 11, 1926.

HAUNTS AND HABITS.—The Piping Plover is even more characteristic of the ocean beaches than the Ringneck. The pale colors of the birds harmonize well with the whitish sands over which they run with surprising swiftness. Like the other small plovers, they occur mostly in small, loose flocks, often in company with other species of shore birds. Their notes are peculiarly musical and attractive. Langille thus describes them (1884, p. 524):

> *Queep, queep, queep-o,* or *peep, peep, peep-lo,* each syllable being uttered with a separate, distinct, and somewhat long-drawn enunciation, may imitate its peculiar melody—the tone of which is round, full, and sweet, reminding one of a high key on an Italian hand-organ, or the *hautboy* in a church organ.

FOOD.—According to Forbush (1925, vol. 1, p. 473): "The food of the Piping Plover consists of insects, crustaceans, mollusks, and other small marine animals and their eggs." In the stomachs of four birds taken on the Alabama coast were found marine worms, fly larvae, and beetles.

CUBAN SNOWY PLOVER: *Charádrius nivósus tenuiróstris* (Lawrence)

RECOGNITION MARKS.—Slightly smaller and even paler than the Piping Plover, with *longer, slenderer, black* bill; broad stripe across forehead, and a large spot on each side of breast, fuscous or fuscous-black; *legs black.* (Plate 35.)

RANGE.—Resident on the Gulf coast from Corpus Christi, Texas, to Florida; in the Bahamas, Cuba, Yucatan, and on the coasts of Venezuela, Brazil, and Paraguay.

DISTRIBUTION IN FLORIDA.—Resident and breeding on the Gulf coast in small numbers from Pensacola south at least to Estero Island, and possibly to the Florida Keys. Cherrie (1897, p. 402) recorded the species breeding on Santa Rosa Island in 1897, and we saw several of the birds there late in April, 1926. Several pairs, apparently ready to breed, were seen on St. George Island, May 9, and others on Dog Island, May 10, and on Peninsula Point, May 11, 1926. One bird was shot near St. Marks Light, January 12, 1920, and three on Hurricane Island, at the mouth of St. Andrews Bay, February 11, 1920. A pair was taken at Big Pass, near Clearwater, June 5, 1918, and a single bird at Cedar Keys, February 20, 1923. W. G. Fargo reports the birds common at Pass-a-Grille and Estero Island in January and February, 1924. On Mullet Key, March 21, 1927, he collected a female specimen containing an egg ready to lay. Audubon's record (1835, vol. 3, p. 154) of a nest and eggs of the Piping Plover found on the Florida Keys in May probably refers to this species.

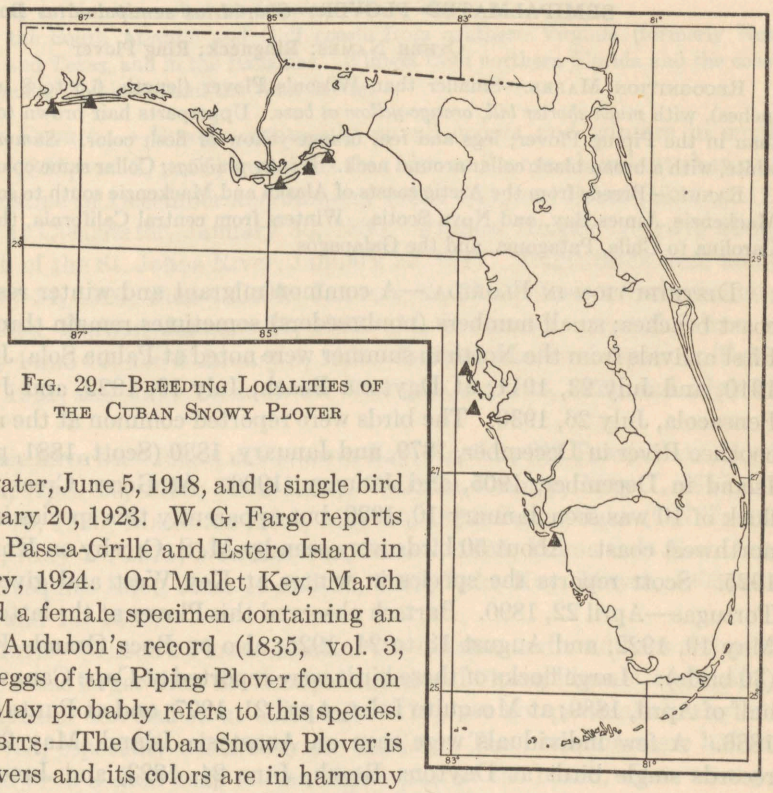


FIG. 29.—BREEDING LOCALITIES OF THE CUBAN SNOWY PLOVER

HAUNTS AND HABITS.—The Cuban Snowy Plover is the palest of the plovers and its colors are in harmony with the white sands where it lives. As the little birds run swiftly along the beaches, they appear more like shadows than birds, and when they remain motionless they are almost indistinguishable. They are confined strictly to the ocean beaches or the nearby mud flats. Two nests, each with 3 heavily incubated eggs, were discovered by F. M. Weston, May 30, 1926, and July 9, 1927, near Pensacola, on a narrow strip of sand beach separating a wide lagoon from the Gulf. Both nests were on the shoreward edge of the nests of a colony of Least Terns, in a small hollow in the sand on top of a slight natural mound, among clumps of grass and other beach vegetation. In the same locality, June

24, 1928, H. L. Stoddard noted two nests, one with 3, the other with 2, eggs. A nest with 3 eggs was found by Charles E. Doe, at Clearwater, May 26, 1927.

The voice of this bird is described by Weston (Bent, 1929, p. 252) as follows:

> When on the ground the Cuban snowy plover gives a low-pitched, musical whistle, roughly indicated by the words *pe-wee-ah* or *o-wee-ah*, the accent being on the second syllable with the first and third almost inaudible at a distance of 30 feet. The flight note is a purring whistle, suggestive of the rolling note of the Carolina wren but pitched lower and not as strident.

FOOD.—Examination of 10 stomachs of this Plover from the Gulf coast of Florida and Alabama showed its food to consist principally of amphipods, small mollusks, beetles, marine worms, and a few seeds.

SEMIPALMATED PLOVER: *Charâdrius semipalmâtus* Bonaparte

OTHER NAMES: **Ringneck; Ring Plover**

RECOGNITION MARKS.—Smaller than Wilson's Plover (length, 6.5 to 8 inches; spread, 14 to 16 inches), with *much shorter bill, orange-yellow at base.* Upperparts hair brown (dark drab), much darker than in the Piping Plover; legs and feet orange-yellow or flesh color. *Summer plumage:* Underparts white, with a broad black collar around neck. *Winter plumage:* Collar same color as back. (Plate 35.)

RANGE.—Breeds from the Arctic coasts of Alaska and Mackenzie south to southern Yukon, southern Mackenzie, James Bay, and Nova Scotia. Winters from central California, the Gulf coast, and South Carolina to Chile, Patagonia, and the Galapagos.

DISTRIBUTION IN FLORIDA.—A common migrant and winter resident, chiefly on the coast beaches; small numbers (nonbreeders) sometimes remain throughout the summer. First arrivals from the North in summer were noted at Palma Sola, July 10, 1912, July 20, 1910, and July 23, 1911; at Daytona Beach, July 19, 1922, and July 26, 1925; and at Pensacola, July 26, 1930. The birds were reported common at the mouth of the Withlacoochee River in December, 1879, and January, 1880 (Scott, 1881, p. 18), and on Amelia Island in December, 1905, and January, 1906. At Goose Creek, Wakulla County, a flock of 10 was seen January 10, 1920, but apparently this species is not common on the northwest coast. About 50 birds were seen by M. S. Crosby on Knight's Key, March 3, 1925. Scott reports the species in winter at Key West and gives one record for the Tortugas—April 22, 1890. Bartsch observed this Plover at the latter place, May 7, 1913, May 19, 1922, and August 13 to 24, 1925; also on Boca Grande Key, January 6, 1919 (30 birds). Large flocks of these birds were reported at Cape Canaveral during the latter half of April, 1889; at Mosquito Inlet, April 21, 1927; and at Punta Rassa, May 13 to 25, 1886. A few individuals were seen on Anastasia Island, May 27, 1925. Longstreet records single birds at Daytona Beach, June 24, 1923, and June 2, 7, and 21, 1925. Bayard Christy saw a small flock at Cape Sable, February 26, 1927, and we noted about 12 birds along the Kissimmee River, near Lake Kissimmee, May 12, 1929.

HAUNTS AND HABITS.—The Semipalmated Plover, or Ringneck, is a lover of the sandy ocean beaches and to a less extent of the mud flats in the bays and lagoons along the coast. The birds travel in loose flocks of their own kind or in association with the smaller sandpipers. They spread out while feeding on the beach, running rapidly about on the sand and picking up morsels of food exposed by the receding waves. Their call is a clear, mellow whistle of two slurred notes.

FOOD.—Forbush (1925, vol. 1, p. 470) says of this species: "Its food on the coast consists largely of small crustaceans, mollusks, eggs of marine animals, and insects. . . . In the interior it feeds on locusts, other Orthoptera and many other terrestrial insects." Townsend (in Bent, 1929, p. 221) states that in the stomachs of 12 birds shot on beaches he has found "worms, small mollusks (*Littorina, Mytilis*), various crustaceans (*Orchestia, Gammarus, Limnorina*), and insects."

WILSON'S PLOVER: *Pagólla wilsónia wilsónia* (Ord)

OTHER NAMES: Ringneck; Ring Plover; Stuttering Plover

RECOGNITION MARKS.—Slightly larger than the Semipalmated Plover (length, 7 to 8.15 inches; spread, 14 to 16 inches; bill, .70 to 1.05 inches), with *much longer and stouter black bill;* upperparts light hair brown or drab (darker than in the Piping Plover; paler than in the Semipalmated); breast collar black in male, mouse gray or cinnamon-drab in female. (Plate 35.)

RANGE.—Breeds on the South Atlantic and Gulf coasts from southern Virginia (formerly New Jersey) south to Florida and Texas, and in the Bahamas. Winters from northern Florida and the coast of Texas south to Guatemala, Honduras, and the West Indies.

DISTRIBUTION IN FLORIDA.—Breeds commonly on all coasts and winters in small numbers. Audubon (1835, vol. 3, p. 75) mentions this bird as "more abundant than any other" near St. Augustine in December and January (1831–32), and Scott (1881, p. 18) reports it abundant at Clearwater, January 30, 1880. Francis Harper recorded about 12 birds at the mouth of the St. Johns River, January 22, 1917. Single birds were noted at St. Marks, January 24, 1920; Pass-a-Grille, January 23, 1919; Caseys Pass, January 30, 1919; and Charlotte Harbor, January 31, 1922. M. S. Crosby reported 6 seen at Fort Myers, January 4 and 10, and February 4, 1926. Bartsch observed a pair on Bahia Honda Key, June 6, 1921, and single birds on the Tortugas, June 18, 1921, and May 14, 1922.

Eggs of this species have been found at Sarasota Bay, April 8; Old Tampa Bay, April 20; Coronado Beach, April 26, 1925; Shell Point, Wakulla County, May 7, 1917; St. George Island, May 10, 1926; Matanzas Inlet, May 18, 1894; Seven Oaks (Old Tampa Bay), May 18, 1899, May 28, 1911; New Smyrna, June 2, 1925; Palma Sola Bay, June 14, July 12, 1924; Mosquito Inlet, June 11 and 15, 1922; Lake Key, May 8, 1903; and Key West, June 11 and 14, 1888.

HAUNTS AND HABITS.—Wilson's Plover inhabits the beaches and mud flats along the coast. The birds are a size larger than the Semipalmated and Piping Plovers, and may be recognized by their greater size and stout black bill. They are not particularly shy and may easily be observed, especially when they are nesting. The nests are mere hollows scratched in the sand or in a shell heap on the higher part of the beach, often among a group of nests of the Least Tern. The eggs number usually 3 or 4, rarely 5.

The rather harsh notes of this plover are described as stuttering, or again as "half a whistle and half a chirp" (Coues). Nichols (Bent, 1929, p. 261) speaks of the bird's common note as "a tern-like *quip*, sometimes double *qui-pip*. Less frequently, on the ground it has a surprisingly human-whistled *whip*." The birds are not especially gregarious but sometimes occur in small flocks and several pairs often nest rather near together. According to Audubon they feed as much by night as by day; I have heard their calls at 9 p.m., and again in the morning just before daylight.

FOOD.—Nine stomachs of this Plover from the coasts of Florida and Alabama have been examined; the food contents comprised small crabs, shrimps, crawfishes, scallop bivalves, ground beetles, leaf beetles, click beetles, ants, bugs, spiders, and crane flies.

MOUNTAIN PLOVER: *Eúpoda montâna* (Townsend)

RECOGNITION MARKS.—Nearly the size of the Killdeer (length, 8 to 9.5 inches; spread, 17.5 to 19.5 inches; bill, .78 to .90 inch), but with longer legs and shorter wings and tail; *no black on breast*, which is faintly washed with pale pinkish cinnamon; upperparts light drab, varied with light pinkish cinnamon; wings and tail fuscous, the latter narrowly tipped with buffy white.

RANGE.—Breeds from northern Montana and North Dakota south to New Mexico, northwestern Texas, and Oklahoma. Winters from northern California, southern Arizona, and southern Texas south to southern Lower California and central Mexico. Accidental in Florida and Massachusetts.

DISTRIBUTION IN FLORIDA.—Of accidental occurrence; known from three records. Of his experience with this species, Maynard (1881, p. 360) says: "On the first day of December, 1870, as I was walking along the beach, near the barracks, at Key West, I observed a small flock of about half a dozen birds running in front of me, occasionally uttering a low mellow whistle." They were unfamiliar to him, and one was collected, which proved to be a Mountain Plover. This specimen is apparently No. 2832 of the Cory collection now in the Field Museum, which is marked, "From C. J. Maynard," but the original label has been removed. The second record was furnished by R. W. Williams, who took two specimens at James Island, late in July, 1901. These were carefully identified but have since been accidentally destroyed. The third record was supplied by R. J. Longstreet (1928f, p. 208), who collected a specimen at Daytona Beach, December 17, 1927. This is now in a collection of birds on exhibit at the Pier Museum in Daytona Beach.

HAUNTS AND HABITS.—The Mountain Plover is not well named, for it is found on the dry, grassy plains of the West, rather than in mountainous districts. In winter the birds sometimes occur in large flocks, and are usually not very shy. Coues (1874b, p. 488) says: "On being disturbed by too near approach, they lower the head, run rapidly a few steps in a light, easy way, and then stop abruptly, drawing themselves up to their full height, and looking around with timid yet unsuspicious glances." The bird collected by Longstreet was on the ocean beach, associating with a flock of Knots, and was quite unsuspicious.

KILLDEER: *Oxyéchus vocíferus vocíferus* (Linnaeus)

OTHER NAMES: **Killdee; Meadow Plover; Killdeer Plover**

RECOGNITION MARKS.—Larger than Wilson's Plover (length, 9 to 11 inches; spread, 19 to 21 inches; bill, .60 to .90 inch), with longer wings and tail. Head, fore back, and wing coverts hair brown (dark drab); rump and upper tail coverts pinkish cinnamon; underparts white, with *two black bands* on neck and breast. (Plate 37.)

RANGE.—Breeds from central British Columbia, southern Mackenzie, and northern Ontario south to the Bahamas, Florida, central Mexico, and southern Lower California. Winters from southern British Columbia, Colorado, Missouri, southern Illinois, western New York, and New Jersey south to the Bermudas, West Indies, northern Venezuela, and northwestern Peru.

PLATE 36

EXPLANATION OF PLATE 36

BIRDS OF THE SAND FLATS

The upper figures, from left to right, are: Hudsonian Curlew, two Dowitchers (winter and summer), and a Knot in summer plumage; the middle figures, from left to right, are: two Black-bellied Plovers (winter and summer), and a Knot in winter plumage; the two lower figures are Turnstones (male and female).

PLATE 36

DISTRIBUTION IN FLORIDA.—An abundant winter resident in all sections; breeds locally in small numbers, chiefly in northern and central Florida. Nests have been found at Tallahassee, Gainesville (May 30, 1895); Archer (April 6, May 24, 1887); Micanopy (April 23, 1924); Thonotosassa (April 18, 1889; May 20, 1888); Clearwater (April 24, 1927); Lake Harney (May 6, 1917; June 13, 1920); Orlando (June 9, 1912); Fort Christmas (April 13, 1930); Kissimmee (May 10, 1901); and Istokpoga Lake (April 7, May 1, 1923). A pair seen near Fellsmere, May 13, 1925, was probably breeding, as was, also, a pair noted at Pensacola in May, 1928. Migrants from the North arrive in numbers in northern Florida during October, and remain until about the third week in March. The center of abundance for this species during the winter seems to be the vicinity of Okeechobee Lake. On February 6, 1917, Francis Harper observed about 200 Killdeers on the lake shore between Eagle Bay and the mouth of Taylor Creek. I found them common on the everglade prairies near Royal Palm State Park and on the coastal prairie near Cape Sable in January and February, 1918. They are reported common on Upper Matecumbe Key and abundant at Key West. Bartsch noted four birds on the Tortugas, January 11 to 15, 1919.

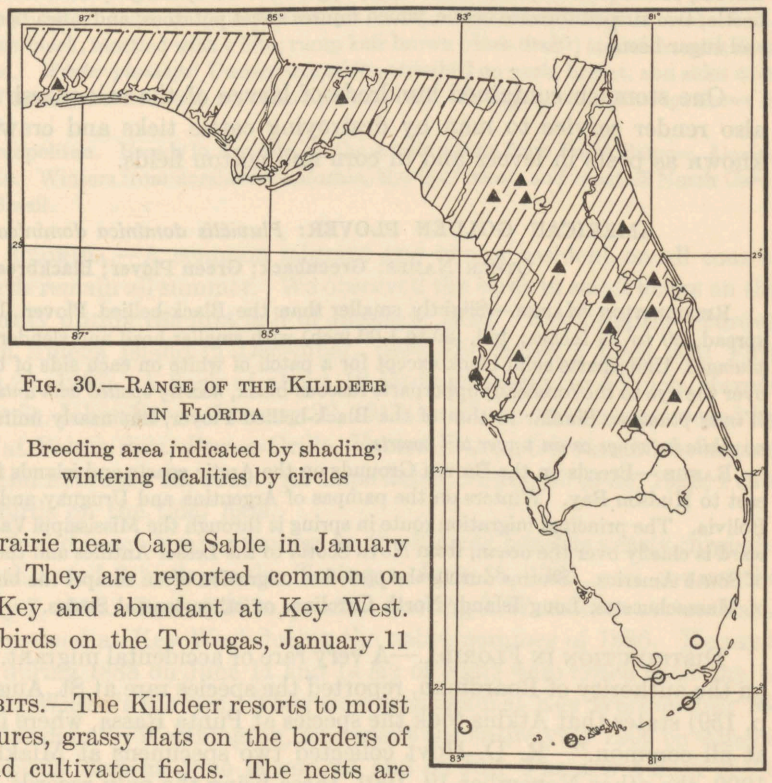


FIG. 30.—RANGE OF THE KILLDEER IN FLORIDA

Breeding area indicated by shading; wintering localities by circles

HAUNTS AND HABITS.—The Killdeer resorts to moist prairie lands or pastures, grassy flats on the borders of lakes or streams, and cultivated fields. The nests are very simple, consisting of slight depressions in the ground, among short thick grass near water or on a corn or cotton row in cultivated land, and are lined with a little dead grass. H. L. Stoddard reports two nests with eggs noted on the bottom of a dried-up pond in Leon County, June 12, 1927. The birds are always wary and usually very noisy. On the approach of a person they fly off with loud cries of *kill-deé*, *kill-deé*, or run rapidly until out of danger. If the nest is approached too closely, the sitting bird will slip off unobserved but will return to defend her eggs, striving by every means to attract the intruder away from the nest. The flight of the Killdeer is strong and rapid, and on the ground the birds run with considerable speed. They are somewhat gregarious, several pairs often breeding in the same field, and in winter they gather into good-sized flocks. On the farm they often follow the plowman in search of grubs or worms.

FOOD.—The food of the Killdeer, as studied by McAtee (1924, p. 14), was found to consist of the following principal items: Beetles, 37 per cent; other insects, comprising grasshoppers, caterpillars, ants, bugs, caddis flies, dragon flies, and two-winged flies, 39.5 per cent; and other invertebrates, including centipedes, spiders, ticks, oyster worms, earthworms, snails, crabs, and other crustaceans, 21 per cent. McAtee says:

> Among the injurious beetles consumed are the following weevils: Alfalfa weevil, cotton-boll weevil, clover-root weevil, clover-leaf weevil, rice weevil, cowpea curculio, white-pine weevil, and bill bugs. . . . Other destructive beetles devoured are white grubs and their adult forms, the May beetles; wireworms and their imagos, the click beetles; larvae of the genus *Ligyrus*, which attack sugar cane, corn, and carrots; brown-fruit beetles, which injure apples and corn; the grapevine leaf-beetle; southern corn-leaf beetle; two striped tortoise beetle, which injures sweet potatoes; and a flea beetle which attacks tobacco and sugar beets.

One stomach contained hundreds of larvae of the salt-marsh mosquito. The birds also render service to man by destroying cattle ticks and crawfishes, the latter well known as pests in levees and in corn and cotton fields.

AMERICAN GOLDEN PLOVER: *Pluviālis domínica domínica* (Müller)

OTHER NAMES: **Greenback; Green Plover; Blackbreast**

RECOGNITION MARKS.—Slightly smaller than the Black-bellied Plover (length, 9.75 to 11 inches; spread, 20 to 23 inches; bill, .80 to 1.00 inch) with smaller head and slenderer bill. *Adult in breeding plumage:* Underparts solid black except for a patch of white on each side of breast and neck, reaching over the eye to the forehead; upperparts fuscous-black, *heavily spotted with antimony yellow* (light ocher). *Winter plumage:* Similar to that of the Black-bellied Plover, but nearly uniform mouse gray beneath; *no white in wings or on upper tail coverts.*

RANGE.—Breeds on the Barren Grounds on the Arctic coasts and islands from northwestern Alaska east to Hudson Bay. Winters on the pampas of Argentina and Uruguay and in Paraguay, Brazil, and Bolivia. The principal migration route in spring is through the Mississippi Valley, but the return southward is chiefly over the ocean, from Nova Scotia to the Lesser Antilles and thence to the northern coast of South America. Storms during the period of migration often compel the birds to alight on the coasts of Massachusetts, Long Island, North Carolina, or other coastal States.

DISTRIBUTION IN FLORIDA.—A very rare or accidental migrant. Allen (1871, p. 354), on the authority of Boardman, reported the species rare at St. Augustine. Scott (1889a, p. 159) states that Atkins took the species at Punta Rassa, where it was considered "not at all common." R. D. Hoyt collected two specimens at Miakka, one in December, 1900, the other November 19, 1901, these being the only records of the bird ever made by Mr. Hoyt during many years' residence in Florida. These specimens are now in the collection of the Florida State Museum. H. L. Stoddard saw a single bird at Lake Jackson, April 7, 1928.

HAUNTS AND HABITS.—The habits of the Golden Plover, as observed in New England, are well described by Mackay (1891a, pp. 18–19) as follows:

> When in Massachusetts they frequent the extensive marshes, and the large tract known as the common pasture near Newburyport; on Cape Cod they seem to prefer the long reach of sandy hills, old fields where the grass is short and the vegetation scanty, sand flats left by the receding tide, ploughed fields, and any burnt tracts which are clear of trees and bushes. . . . When on the ground they run rapidly and gracefully, and soon scatter on alighting. After running a few yards they suddenly stop, hold the head

erect, and look around, all the movements being very quick. In feeding, they seem to strike at the object with a motion that reminds one of a Loon or Grebe commencing to dive. . . . When flying near the ground they course over it at a high rate of speed, in every variety of form, the shape of the flock constantly changing, and frequently following every undulation of the surface, stopping suddenly and alighting when a favorable spot is noticed.

BLACK-BELLIED PLOVER: *Squatârola squatârola* (Linnaeus)

OTHER NAMES: Blackbreast; Beetlehead; Bullhead Plover; Gray Plover

RECOGNITION MARKS.—The largest of the American plovers (length, 10.5 to 13.5 inches; spread, 22 to 25 inches; bill, 1 to 1.25 inches); distinguished from the sandpipers by short legs, stocky form, and short neck. *Adult in breeding plumage:* Most of underparts solid black; forehead and sides of neck white; most of upperparts fuscous-black, mottled with white; rump hair brown (dark drab); *tail white*, with dark crossbars, chiefly near end. *Winter plumage:* Underparts white, streaked on neck, breast, and sides with mouse gray; upperparts fuscous, mottled with white and pinkish buff. In flight, *white in wings* shows in all plumages. (Plate 36.)

RANGE.—Nearly cosmopolitan. Breeds in America on the Arctic coasts from Point Barrow, Alaska, east to Melville Peninsula. Winters from northern California, the Gulf coast, and coast of North Carolina south to Peru and Brazil.

DISTRIBUTION IN FLORIDA.—A common migrant and winter resident on all coasts; a few nonbreeding birds remain all summer. We observed the birds in small flocks on the coast of Wakulla County during the first half of January, 1920. Worthington recorded them as abundant on Amelia Island in December, 1905, and noted a flock near Fort Bassenger, February 23, 1907. A flock of about 18 birds was seen by Francis Harper near the mouth of the St. Johns River, January 22, 1917; smaller numbers were noted by Alexander Wetmore at Palma Sola, Pass-a-Grille, Venice, Punta Gorda, and Sebastian between January 21 and February 13, 1919. At Cape Sable, March 27 to 30, 1926, I saw between 40 and 50 birds on the tidal flats.

These Plovers are found in moderate numbers on the Florida beaches nearly throughout the year. Bartsch noted 3 birds on the Tortugas, June 18, 1921, and one on the Marquesas Keys, May 7, 1913. Scott (1889a, p. 159), quoting J. W. Atkins, states that a pair of these birds remained at Key West during the entire summer of 1886. He says, also: "At Key West during 1888 on June 11 and 14 six or eight were noted each day in company with breeding Wilson's Plovers. They were seen again at Key West on July 26, and regularly after that date." Worthington, who spent the entire year 1906 on Amelia Island, observed the birds there on June 14 and 29, and on July 4 he saw a flock of 13. Longstreet (1925c, p. 582) records them at Daytona Beach on June 3, 7, 17, and July 2. At Palma Sola, the first south-bound migrants were reported on July 17, 1914, and July 21, 1911. In spring migration they occur in flocks of considerable size. Asa Pillsbury reported 200 birds at Palma Sola on May 31, 1906, which date probably coincides with the height of the migration. Scott (1887b, p. 219) recorded the species as abundant at Punta Rassa, May 13 to 25, 1886, and Nicholson and Dawson observed about 200 birds at Mosquito Inlet, April 21, 1927.

HAUNTS AND HABITS.—The Black-bellied Plover is the largest of the shore birds commonly found on the Florida beaches. The birds patrol the ocean beaches near the surf line, usually in pairs or small companies, often associated with Turnstones, Knots,

and smaller sandpipers. They are usually very wary and take flight at the near approach of a person, circling over the water out of gunshot, and uttering their loud, melodious *peé-oo-eee*. They are less gregarious than the sandpipers, but sometimes they gather into moderate-sized, though not compact, flocks. Though partial to sandy beaches along the ocean, they feed also on mud flats in the bays and lagoons and occasionally visit the larger rivers or lakes of the interior.

Food.—Examination of 24 stomachs of this Plover from the coasts of Florida, Georgia, and South Carolina shows its food to consist principally of crabs (*Panopeus herbstii; Neopanope texana; Pachygrapsus transversus; Sesarma reticulatum*), hermit crabs (*Pagurus longicarpus*), fiddlers (*Uca pugnax*), and mollusks,[1] with smaller quantities of grasshoppers (*Tettigia armata*), fly larvae, small fishes, and roundworms (*Nereis*).

RUDDY TURNSTONE: *Arenária intérpres morinélla* (Linnaeus)

Other Names: **Brant Bird; Calicoback; Rock Plover; Salt-water Partridge; Calico Plover**

Recognition Marks.—Slightly smaller than the Knot (length, 7.75 to 9.90 inches; spread, 16 to 19 inches; bill, .80 to 1.00 inch), with *short red legs*. *Adults in breeding plumage:* Head mostly white with black markings on side; breast black; belly and rump white; fore back and wings black, varied with russet; recognized in flight by its pied appearance. *Winter plumage:* Head, breast, and upperparts mainly hair brown (dark drab) or sooty drab, without russet markings. (Plate 36.)

Range.—Breeds on the Arctic coasts of Alaska and Mackenzie and northward probably to Melville Island and northwestern Greenland. Winters from the coasts of central California, Texas, Louisiana, North Carolina, and Bermuda south to southern Brazil and central Chile.

Distribution in Florida.—An abundant migrant and common winter resident on all coasts; many birds remain also throughout the summer, but do not breed. Scott (1881, p. 18) records the Turnstone abundant during November, December, and January at the mouth of the Withlacoochee River. Griscom (1916a, p. 31) reported four seen at East Goose Creek, Wakulla County, December 29, 1915, and Wetmore noted a flock of about a dozen at Pass-a-Grille, January 23, 1919. About 50 birds were observed at Pine Island, Charlotte Harbor, January 20, 1924 (L. B. Hunt). Worthington reports them common on Amelia Island in December, 1905.

As the birds are present throughout the year, it is not possible to give exact migration dates. The occurrence of a flock of about 100 birds at Mosquito Inlet, March 23, 1924, however, indicates the beginning of spring migration. Scott recorded the birds as abundant near Punta Rassa, May 13 to 25, 1886, and we found them common on the ocean beach from Daytona Beach to Mosquito Inlet, May 17, 1925. Longstreet observed them on this beach on June 2, 7, 21 (300), 28, July 2, 11, and 26, 1925. Miss Earle reported a flock of about 14 in Palma Sola Bay, June 25, 1910. A few were seen at Key West, June 11 and 14, 1888 (Scott, 1889, p. 159). Bartsch saw a flock of 11 birds on the Tortugas, June 9 and 18, 1921, and another flock of 14 on May 14, 1922.

Haunts and Habits.—The Turnstone frequents ocean beaches and sandy flats in the coastal bays and lagoons, where it occurs in flocks in association with Knots, Sanderlings, and smaller sandpipers. As its name implies, it turns over stones, sticks, shells,

[1] *Littorina irrorata, Mactra lateralis, Melampus borealis, Ilyanassa obsoleta, Gemma gemma, Nassa trivittata, Neverita duplicata, Donax* sp., *Turbonella* sp.

and bunches of seaweed in search of food. On a sandy beach at Big Pass, just after the tide began to ebb, I noticed several Turnstones busily digging holes in the soft, wet sand, throwing the sand out on either side with their bills until the holes were 4 or 5 inches deep. Their voice is described as "a loud, twittering note or a chuckling whistle; in flight a clear, deep, melodious *quittock, quittock* . . ." (Forbush). Nichols (in Bent, 1929, p. 290) says: "This note is sometimes three syllabled, *ketakek*, or may be of a single syllable, *kek*, on taking wing."

Food.—According to Bent (1929, p. 287):

> Their main food supply evidently consists of small crustaceans, small mollusks, insects, and their larvae, all of which they consume in large quantities and in great variety. . . . On the coast of South Carolina I have seen turnstones feeding on the beds of coon oysters and have watched them busily engaged in chasing the small fiddler crabs on the muddy banks of tidal creeks and on the mud lumps. . . .

SNIPES AND SANDPIPERS: FAMILY SCOLOPACIDAE

AMERICAN WOODCOCK: *Philohela minor* (Gmelin)

Other Names: **Wood Snipe; Bog-sucker; Hill Partridge**

Recognition Marks.—Length, 10 to 12 inches; spread, 16 to 20 inches; bill, 2.5 to 3 inches, stout, tapering, nearly straight; underparts cinnamon; upperparts variously mottled with black, mouse gray, hair brown (dark drab), and cinnamon. Recognized by its stocky body, short, broad wings, long stout bill, and *whistling sound emitted when flushed.*

Range.—Breeds in eastern North America from North Dakota, Manitoba, southern Ontario, southern Quebec, and Nova Scotia south to eastern Colorado, southeastern Texas, southern Louisiana, and central Florida. Winters from southern Missouri, northern Indiana, and New Jersey south to Texas and central Florida.

Distribution in Florida.—Occurs as a moderately common winter resident in northern Florida as far south as Orlando, and less commonly as far as the Caloosahatchee River. It has been recorded in winter from St. Marks, Pensacola, Panasoffkee Lake, Lake Harney, Wauchula, Gainesville, Tarpon Springs, Kissimmee, Lake Flirt, La Belle, Eustis, Apopka, Anthony (Marion County), and Levy County. H. W. Ballantine reported 10 birds seen at Orlando, December 11, 1914. A large flight occurred at St. Augustine in February, 1877, when hundreds of Woodcock were killed (Forest and Stream, vol. 8, 1877, p. 129).

Nesting records are few, and the southern limits of the breeding range are not accurately known. Young birds, recently out of the shell, were found at Jacksonville, March 9, 1877 (Hoyt, 1877, p. 129). Baynard (1913a, p. 243) noted two nests near Micanopy, February 4, 1913, one of which held 3 eggs. In a recent communication he reports finding a nest with 2 eggs, March 30, 1930, on the edge of a marshy piece of woods near Blackwater Creek, about 9 miles north of Plant City. A Woodcock was seen at St. Marks, July 15, 1918, and one at Whitfield, May 9, 1903, so doubtless the birds breed at both these localities.

Haunts and Habits.—The Woodcock dwells in low, moist, woodland thickets and boggy meadows, procuring its food by probing in soft ground with its long bill. It is mainly nocturnal, remaining concealed in underbrush during the daytime, and when

flushed flying rather weakly with a whistling sound for a short distance, soon dropping again to earth to seek concealment. The courtship of the male Woodcock is described by Bent (1927, p. 63), as follows:

> Sometimes, but not always, he struts around on the ground, with tail erect and spread, and with bill pointing downwards and resting on his chest. More often he stands still, or walks about slowly in a normal attitude, producing at intervals of a few seconds two very different notes—a loud, rasping, emphatic *zeeip*—which might be mistaken for the note of the nighthawk, and a soft guttural note, audible at only a short distance, like the croak of a frog or the cluck of a hen. Suddenly he rises, and flies off at a rising angle, circling higher and higher, in increasing spirals, until he looks like a mere speck in the sky, mounting to a height of 200 or 300 feet; during the upward flight he whistles continuously, twittering musical notes, like *twitter, itter, itter, itter*, repeated without a break. These notes may be caused by the whistling of his wings, but it seems to me that they are vocal. Then comes his true love song—a loud, musical, three-syllable note—sounding to me like *chicharee, chicharee, chicharee* uttered three times with only a slight interval between the outbursts; this song is given as the bird flutters downward, circling, zigzagging, and finally volplaning down to the ground at or near his starting point. He soon begins again on the *zeeip* notes and the whole act is repeated again and again.

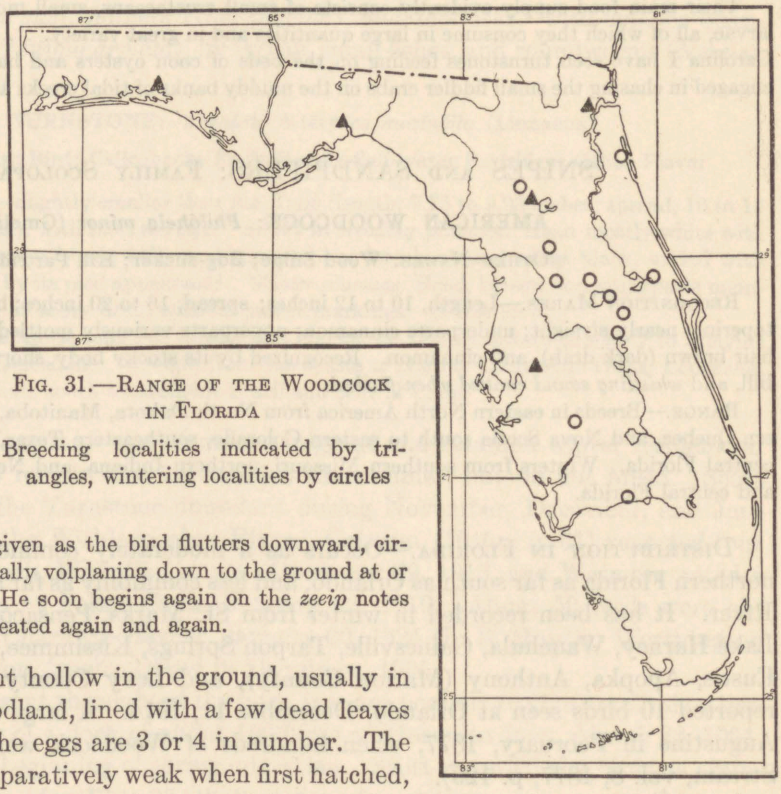


FIG. 31.—RANGE OF THE WOODCOCK IN FLORIDA

Breeding localities indicated by triangles, wintering localities by circles

The nest is a slight hollow in the ground, usually in moist or swampy woodland, lined with a few dead leaves or wisps of grass. The eggs are 3 or 4 in number. The young, which are comparatively weak when first hatched, require the parent's protection for several days, and are frequently carried from place to place by the mother bird clasped between her thighs or between her legs and body.

FOOD.—The principal food of the bird consists of earthworms, varied at times with cutworms, wireworms, crane flies, May flies, click beetles, and grasshoppers. Thus from the standpoint of both the agriculturist and the sportsman this species is worthy of all the protection possible.

WILSON'S SNIPE: *Capélla delicâta* (Ord)

OTHER NAMES: Jack Snipe; English Snipe; Squatting Snipe

RECOGNITION MARKS.—Larger than the Solitary Sandpiper (length, 10 to 11.5 inches; spread, 16 to 20 inches; bill, 2.40 to 2.75 inches). Upperparts fuscous-black, streaked and mottled with light buff and

PLATE 37

EXPLANATION OF PLATE 37

BIRDS OF THE MUD FLATS

The two upper figures at the right are Black-necked Stilts; the middle figure at the left is a Willet; in the center is a Greater Yellow-legs and at its right a Lesser Yellow-legs; the lower figure at the left is a Killdeer, and at the right is a Solitary Sandpiper.

PLATE 37

pinkish cinnamon; breast streaked and spotted with fuscous and pinkish cinnamon; throat and belly white. Recognized by its sharp alarm note and its erratic, zigzag flight. (Plate 23.)

RANGE.—Breeds from northwestern Alaska and northern Mackenzie south to southern California, Nevada, southern Colorado, Iowa, northern Illinois, northern Pennsylvania, and northern New Jersey. Winters from southern British Columbia, southern Montana, Colorado, southern Missouri, and southern Virginia south through Central America and the West Indies to southern Brazil.

DISTRIBUTION IN FLORIDA.—An abundant migrant and winter resident in northern and central Florida, and of rare occurrence in the southern part. First arrivals from the North were noted at Pensacola, September 5, 1920, September 17, 1922, and September 21, 1919; St. Marks, September 12, 1917, September 20, 1918, and September 22, 1916; Orange County, September 27, 1928; and Miakka, October 25, 1900. The last observed in spring were recorded at Tarpon Springs, April 10, 1895; Immokalee, April 15, 1919; Enterprise, April 20, 1858; St. Marks, May 9, 1916; Pensacola, May 4, 1924; and the St. Johns River marshes near Malabar, May 11, 1923. Five birds were seen at Everglade, March 12, 1919, one at the head of the Barnes River, near Chokoloskee, March 18, 1919, one near West Lake, above Cape Sable, February 25, 1919, and one in the Everglades along the Tamiami Trail, February 20, 1927. Two migrating individuals struck the lighthouse on the Tortugas, March 26 and 27, 1919.

HAUNTS AND HABITS.—Wilson's Snipe, more commonly known as the "Jack Snipe," frequents wet boggy meadows and short-grass marshes, where it probes the soft mud at every step in search of food. Although many birds may be found in a small area, they do not fly in close flocks, but usually flush singly or a few at a time, uttering as they rise a startled *scape*. After flying nervously about with a peculiar, erratic flight, they alight in another part of the marsh, usually at no great distance. Snipe are frequently hunted with a dog, but in the South are usually pursued by the hunters alone, the birds flushing readily in easy gunshot. They crouch close to the ground, apparently depending for protection on their concealing coloration, and often do not fly until nearly trodden upon. When first flushed they usually fly low, but when traveling for some distance or when migrating, often fly very high.

FOOD.—Bent (1927b, p. 88) says of this bird:

> Earthworms probably constitute the principal food of the Wilson snipe, but it also eats cutworms, wireworms, leeches, grasshoppers, locusts, beetles, mosquitoes, other insects and their larvae, and some seeds of marsh plants.

LONG-BILLED CURLEW: *Numênius americânus americânus* Bechstein

OTHER NAMES: Sicklebill; Spanish Curlew

RECOGNITION MARKS.—The largest of the shore birds (length, 20 to 26 inches; spread, 36 to 40 inches; wing, 10.50 to 11.75 inches; bill, 5.47 to 8.75 inches) with very long, down-curved bill; underparts light pinkish cinnamon; the neck and breast with narrow fuscous streaks; throat buffy white; upperparts and wings blackish brown mottled with light pinkish cinnamon.

RANGE.—Breeds from central British Columbia, southern Alberta, southern Saskatchewan, and southern Manitoba south to northeastern California, southern Arizona, central New Mexico, and northern Texas (formerly in southern Wisconsin, northern Illinois, Iowa, Nebraska, Kansas, Louisiana, etc.). Winters from central California, southern Arizona, southern Texas, southern Louisiana, and South Carolina south to Guatemala. Formerly an abundant migrant along the Atlantic coast, but now practically exterminated there.

DISTRIBUTION IN FLORIDA.—Formerly an abundant migrant and winter resident on all coasts, but now very rare. Scott (1881, p. 19), in the winter of 1879–80, found the birds common on the Gulf coast at the mouth of the Withlacoochee River and at Clearwater. In a later paper (1889a, p. 158) he stated that the species was present all the year at Punta Rassa and was believed to breed, but this was probably incorrect. Maynard (1881, p. 398) reported it common on the Indian River in 1869, and R. D. Hoyt, who resided at Seven Oaks for many years, told me it was formerly common near there. The few records available indicate that the birds arrived from the North in July and remained until May. Specimens were taken at Tarpon Springs, July 5, 1888, and September 7, 1889, and at Gasparilla Pass, February 6, 1884 (Oberholser, 1918d, p. 190). Miss Eleanor Earle recorded 8 seen at Palma Sola, May 11, 1908, and B. J. Pacetti reported an equal number observed at Ponce Park, July 20 and 21, 1912. Walter Hoxie saw one on the Kissimmee Prairie, October 23, 1888. Alexander Gerhardt (1854, p. 194) mentions seeing some at the mouth of the St. Johns River in February, 1854, and Elliot (1895, p. 152) speaks of killing several from a flock near St. Augustine (date not given).

HAUNTS AND HABITS.—The Long-billed Curlew, largest of the American shore birds, has practically disappeared from the Atlantic coast, although it is still found on the extensive grassy prairies of the Great Plains. Audubon (1835, vol. 3, p. 241) describes the bird's habits as observed in November, 1831, on the coast of South Carolina, as follows:

> The Long-billed Curlew spends the day in the sea-marshes, from which it returns at the approach of night, to the sandy beaches of the sea-shores, where it rests until dawn. As the sun sinks beneath the horizon, the Curlews rise from their feeding-grounds in small parties, seldom exceeding fifteen or twenty, and more usually composed of only five or six individuals. The flocks enlarge, however, as they proceed, and in the course of an hour or so the number of birds that collect in the place selected for their nightly retreat, sometimes amounts to several thousands. . . . As the twilight became darker the number of Curlews increased, and the flocks approached in quicker succession, until they appeared to form a continuous procession, moving not in lines, one after another, but in an extended mass and with considerable regularity, at a height of not more than thirty yards, the individuals being a few feet apart. Not a single note or cry was heard as they advanced. They moved for ten or more yards with regular flappings, and then sailed for a few seconds, as is invariably the mode of flight of this species, their long bills and legs stretched out to their full extent. They flew directly towards their place of rest, called the "Bird Banks," and were seen to alight without performing any of the evolutions which they exhibit when at their feeding-places, for they had not been disturbed that season. But when we followed them to the Bird Banks, which are sandy islands of small extent, the moment they saw us land the congregated flocks, probably amounting to several thousand individuals all standing close together, rose at once, performed a few evolutions in perfect silence, and re-alighted as if with one accord on the extreme margins of the sand-bank close to tremendous breakers. It was now dark, and we left the place, although some flocks were still arriving.

NORTHERN CURLEW: *Numénius americánus occidentális* Woodhouse

RECOGNITION MARKS.—Similar to the typical race (*americanus*) but smaller (wing, 9.92 to 10.82 inches; bill, 4.17 to 7.38 inches).

RANGE.—Breeds from Manitoba, Saskatchewan, Alberta, and eastern British Columbia south to Oregon, Montana, Wyoming, and South Dakota. Winters south to southern California and northern Mexico.

DISTRIBUTION IN FLORIDA.—Known from only a single specimen, taken at Gasparilla Pass, February 5, 1884 (Oberholser, 1918d, p. 194).

HUDSONIAN CURLEW: *Phaéopus hudsónicus* (Latham)

OTHER NAMES: Jack Curlew; Foolish Curlew

RECOGNITION MARKS.—Smaller than the Long-billed Curlew (length, 15 to 18 inches; spread, 31 to 33 inches; bill, 2.75 to 4 inches); larger than the Willet, with more slender, *strongly decurved bill;* upperparts fuscous or dark drab, varied with buffy white; neck and breast streaked and mottled with dark drab; throat and belly white. (Plate 36.)

RANGE.—Breeds on the coast of Alaska and on the Barren Grounds of northern Mackenzie. Winters on the Pacific coast from Lower California south to southern Chile, and on the Atlantic coast from British Guiana to the mouth of the Amazon. Common in migration on the Atlantic coast from Florida to Long Island.

DISTRIBUTION IN FLORIDA.—A common spring and fall migrant, chiefly on the coasts. First arrivals in spring were recorded at Fruitland Park, March 3, 1903 (Keck, 1903, p. 65); Sarasota Bay, March 22, 1872; Orlando, March 25, 1909 (7); Amelia Island, April 14, 1916; Palma Sola Bay, April 17, 1925 (100); and Pensacola, April 18, 1926. Pennock noted the species at St. Marks, April 21, May 2, and May 19, 1919, and J. Y. Gresham recorded a flock of about 15 there May 17, 1926. In the fall migration the species has been reported at Wakulla Beach, July 27, 1924; Tarpon Springs, August 3, 1886; Daytona Beach, August 4, 1928; Palma Sola Bay, July 31, 1924, August 22, 1912; St. Marks, September 24, 1917; New Smyrna, October 5, 1924 (12); and Biscayne Bay, October 20, 1916.

HAUNTS AND HABITS.—Mackay (1892, pp. 347–348) describes the bird's habits in New England, as follows:

> The Hudsonian Curlew is a tide bird, frequenting the sand flats near the edge of the water, when they become uncovered, and resorting to the marshes and uplands when driven from the former by the incoming tide. . . . When a flock of these birds is on the ground where they have been feeding, they become scattered, twenty-five or thirty birds covering fifteen or twenty yards' space. At such times they do not appear to be particularly active, moving about in a rather slow, stately manner, although I have once in a while seen them run. . . . When passing to and from their feeding grounds they usually fly at an altitude of about thirty yards, unless it is quite windy, when they keep within a few feet of the ground, or water, if they are passing over it. I have seen them flying only a few feet above the water during their migration south in July. . . .
>
> They make two notes, one a very clear, penetrating staccato whistle, repeated four or five times in quick succession, and which is very far-reaching. It is given when flying, also when alarmed, and on taking flight. The other consists of two, low, straight whistles or notes, when a flock is alighting. Flocks also make a rolling note, lasting as long as it would take to count six or seven. The sound is similar to that produced by a boy's lead bird whistle filled with water.

FOOD.—Concerning this bird's food habits, Bent (1929, p. 118) says:

> Hudsonian Curlews are mainly shore feeders; on the beaches and sand flats they pick up various insects, worms, small mollusks, and crustaceans, often probing for the sand fleas in the wet sand. . . I have also often seen them on the marshes, or even on high, dry pasture lands . . . where they find grasshoppers, spiders, beetles, and other insects. In South Carolina we saw them at low tide on the oyster banks and on the mud banks riddled with holes of fiddler crabs, on which they were doubtless feeding. In the Magdalen Islands I have seen them on the uplands and among the sand dunes, where they were evidently eating crow berries (*Empetrum nigrum*). They are also said to eat blueberries, dewberries, and various seeds.

UPLAND PLOVER: *Bartrâmia longicâuda* (Bechstein)

OTHER NAMES: Bartramian Sandpiper; Grass Plover; Field Plover

RECOGNITION MARKS.—Slightly larger than the Lesser Yellow-legs (length, 11 to 12.75 inches; spread, 21 to 23 inches; bill, 1.00 to 1.25 inches); underparts buffy white, the breast streaked and barred with fuscous; upperparts fuscous, mottled with buffy white; rump fuscous-black; axillars and lining of wings with fuscous crossbars.

RANGE.—Breeds from northwestern Alaska, southern Mackenzie, and southern Quebec south to southern Oregon, northern Utah, Colorado, southern Oklahoma, northern Texas, southern Illinois, southern Indiana, and northern Virginia. Winters on the pampas of South America (Brazil, Argentina, and Chile).

DISTRIBUTION IN FLORIDA.—A rare spring and fall migrant. First arrivals in spring were reported at Indian Key, March 17, 1857; St. Marks, March 23, 1914 and 1915; Deer Park, March 24, 1924; Leon County, March 25, 1901; Tallahassee, April 2, 1885; Kissimmee River, April 5, 1901; and Lake Jackson, Leon County, April 7, 1928 (5 birds). Migrants were noted, also, at Pensacola, May 9, 1916; Citrus Center, April 20, 1919; and East Pass, Okaloosa County, April 21, 1926. Bartsch observed a single bird on the Tortugas, May 13, 18, and 19, 1922. For the fall migration there are only a few records: Pensacola, August 9, 1919; Arcadia, August 22, 1919; Kissimmee Prairie, August 27, 1929; Cape Canaveral, August 31, 1888; and Key West, October 3, 1888.

HAUNTS AND HABITS.—The Upland Plover is an inhabitant of dry grassy meadows and pastures, and is never found in wet marshes. Formerly abundant over a very wide range in Canada and the northern United States, it is now rapidly approaching extinction. Its disappearance is attributed to unrestricted hunting and to the breaking up of its natural breeding grounds by the spread of agriculture both in its summer home in the United States and in its winter home on the pampas of Argentina. The birds feed in scattered flocks, and are usually wary of a man on foot, but are easily approached by one on horseback or in a vehicle. Their song is described as "a prolonged, weird, mournful, but mellow, rolling whistle like that of autumn wind *wh-e-e-e-e-e-e-e-e-e-e-e-o-o-o-o-o-o-o-o-o-o*" (O. W. Knight, quoted by Bent, 1925, vol. 1, p. 448).

FOOD.—The Upland Plover, living as it does in and about farm lands, bears a closer relation to agricultural interests than do most other shore birds, and a study of its food habits by McAtee (1924, p. 12) has demonstrated that it is highly beneficial. Almost half of its food is made up of grasshoppers, crickets, and weevils, including the cotton-boll weevil, clover-leaf weevil, clover-root weevil, and the cowpea curculio. It devours, also, leaf beetles, click beetles, May beetles, cutworms, army worms, cotton worms, cotton cutworms, sawfly larvae, crane-fly larvae, horseflies and their larvae, and cattle ticks. In view of this excellent record, it is most unfortunate that this fine bird should be rapidly disappearing as a result of persecution by man.

SPOTTED SANDPIPER: *Actítis maculária* (Linnaeus)

OTHER NAMES: Tipup; Peet-weet; Teeter-snipe

RECOGNITION MARKS.—Smaller than the Solitary Sandpiper (length, 6.75 to 8 inches; spread, 13 to 14 inches; bill, .80 to 1.05 inches), with *much shorter wings;* bill flesh color, black tipped; legs greenish yellow. *Adult:* Upperparts hair brown (dark drab), with an olive tinge; underparts white, with *large fuscous*

spots; wings with *conspicuous white bar,* showing in flight; tail *without crossbars. Immature:* Underparts without spots, but breast washed with mouse gray. (Plate 23.)

RANGE.—Breeds from northwestern Alaska, northern Mackenzie, northern Ungava, and Newfoundland south to southern California, central Arizona, southern New Mexico, southern Texas, southern Louisiana, central Alabama, and northern South Carolina. Winters from southern British Columbia, southern Arizona, Louisiana, and South Carolina south to southern Brazil and Argentina.

DISTRIBUTION IN FLORIDA.—An abundant migrant in all parts of the State. Winters in small numbers, and apparently a few remain all summer, but there is no record of their breeding. Migrants in spring are recorded as arriving at Chipley, March 18, 1904; Whitfield, April 3, 1903; Amelia Island, April 5, 1906; and St. Marks, April 10, 1916. The last were seen in spring on the Tortugas, May 22, 1922; at Daytona Beach, May 23, 1925; Pensacola, May 23, 1926, May 31, 1920; and Lake Harney, June 4, 1915. Southbound migrants appeared at Fernandina, July 2, 1906; Palma Sola, July 7, 1912; Pensacola, July 18, 1920; St. Marks, July 21, 1914; Daytona Beach, July 21, 1923; Key West, July 28, 1888; and on the Tortugas, August 14, 1925. Wintering birds are reported from Daytona Beach, December 22 to 25, 1915; Fort Pierce, December and January; Coconut Grove, January 15 to 23, 1925; St. Petersburg, January 18, 1919; and Haulover Canal, November 28, 1928.

HAUNTS AND HABITS.—The Spotted Sandpiper feeds along the shores of rivers, ponds, sloughs, and canals. The birds usually occur in pairs, although several pairs may at times get together into a loose flock. They are ordinarily quite unsuspicious, but when pressed too hard by a boat along a canal or river, they rise with their familiar calls of *peet-weet* and fly ahead of the boat, alighting at no great distance on a log or rock or on the shore. Sometimes, when one is traveling for some distance on a narrow stream, separate pairs of these little Sandpipers are overtaken, until the combined flock may number 20 or 30 birds, all of them rising and flying on ahead as the boat approaches too near.

Both in flight and on the ground this Sandpiper is easily recognized. In the air, the broad white bar across each wing is very noticeable, and the quick, tremulous movement of the wings followed by a short period of scaling distinguishes it from any other bird. On the ground the bird is scarcely ever still, but is constantly tilting the body and tail as if there were springs in its legs. This species can swim and dive with facility. Forbush says (1925, vol. 1, p. 452): "It can dive from the surface of the water or from full flight, at need. Under water it progresses by using its wings which it spreads quite widely, and in shallow water it can go to the bottom and run a short distance with its head held low and tail raised like an Ouzel or Dipper."

FOOD.—Of its feeding habits, Forbush (1925, vol. 1, p. 453) says:

> Spotted Sandpipers often frequent cultivated fields at some distance from water, and as they feed largely on locusts, grasshoppers and caterpillars, such as cutworms, cabbage worms and army worms, also beetles, grubs and other pests of cultivated lands, the birds should be preserved for the good work they do among the crops.

EASTERN SOLITARY SANDPIPER: *Trînga solitâria solitâria* Wilson

OTHER NAMES: Wood Tattler; Peet-weet

RECOGNITION MARKS.—Smaller than the Lesser Yellow-legs (length, 7.5 to 9 inches; spread, 15 to 17 inches; bill, 1.12 to 1.30 inches). Very similar in color to the Yellow-legs, but *legs and bill dull olive*

greenish; upperparts darker, with an olive tinge; *upper tail coverts fuscous;* tail white, with broad fuscous barring. (Plate 37.)

RANGE.—Breeding range imperfectly known; the species is recorded in summer from central Alberta, northern Manitoba, northern Ungava, and Newfoundland south to Nebraska, Iowa, Illinois, Indiana, Ohio, and Pennsylvania. Winters from Argentina, Peru, and Bolivia north to southern Mexico and the West Indies, and casually in Florida.

DISTRIBUTION IN FLORIDA.—A common migrant throughout the State; apparently winters in small numbers. Migrants from the North in summer are recorded as arriving at Pensacola, July 12, 1919, July 16, 1925, and July 18, 1920; Bradenton, July 12, 1925; and St. Marks, July 28, 1916. The species was reported common at Key West, July 28, 1888. The last birds seen in fall were noted at St. Marks, October 12, 1915; Pensacola, October 15, 1924; Kissimmee Prairie, October 23, 1888; and St. Lucie, October 19, 1918. Wintering records are as follows: Seven Oaks, Pinellas County, January, 1904 (3 specimens in Florida State Museum); Pensacola, February 24, 1924 (1); February 21, 1926 (1); West Lake, near Cape Sable, February 25, 1919 (one seen by A. Wetmore). Spring migrants usually arrive during March and April, and have been recorded at Melbourne, March 7, 1930; Pass-a-Grille, March 8, 1924; Pensacola, March 11, 1919 and 1928; March 13, 1921; Leon County, March 25, 1901; and Gainesville, April 2, 1887. The last observed in spring were noted at Fellsmere, May 13, 1925, and at Pensacola, May 23, 1919, May 29, 1921, and May 30, 1920.

HAUNTS AND HABITS.—The Solitary Sandpiper is well named, for in contrast to most of the shore birds, it is rarely found in flocks, but occurs singly or in pairs or small groups. Nor is it a true shore bird, but rather an inhabitant of upland swamps, wet meadows, and the borders of ponds and creeks in the woods. The birds are quiet and unobtrusive in habit, but when startled they fly up, uttering a rather loud, musical *peet-weet* similar to the note of the Spotted Sandpiper. The flight is strong and graceful, resembling that of Wilson's Snipe, and unlike the steady sailing flight of the Spotted Sandpiper. Usually the birds alight again at no great distance and as their feet touch the ground, the wings are raised until their tips nearly meet above, then are slowly folded. On the ground, they are much given to bobbing the head and body.

FOOD.—The food habits of this species have not been studied in detail. Bent (1929, p. 5) mentions the following items as composing its diet: Dragon-fly nymphs, water-scavenger beetles, water boatmen, grasshoppers, caterpillars, spiders, worms, small crustaceans, and small frogs.

EASTERN WILLET: *Catoptrophorus semipalmatus semipalmatus* (Gmelin)

OTHER NAMES: White-wing Curlew; Stone Curlew; Bill-willie

RECOGNITION MARKS.—About the size of the Greater Yellow-legs (length, 14 to 16 inches; spread, 24 to 29 inches; bill, 1.90 to 2.30 inches), but with shorter, stouter, bluish legs and heavier bill; readily distinguished in flight by the *large white patches in the wings. Spring plumage:* Neck and breast spotted and barred with hair brown. *Winter plumage:* Neck and breast rather faintly clouded with mouse gray; rump hair brown; upper tail coverts white, *without barring.* (Plate 37.)

RANGE.—Breeds in Nova Scotia and on Prince Edward Island; on the Atlantic coast from southern New Jersey to Florida and the Bahamas; and on the Gulf coast to Texas. Winters from South Carolina and the Bahamas south to Brazil and southern Peru.

PLATE 38

EXPLANATION OF PLATE 38

SANDPIPERS

The two upper figures are Least Sandpipers in summer (left) and winter plumages; at their right is a pair of Semipalmated Sandpipers in winter (upper) and summer plumages; in the center is a pair of Western Sandpipers in winter (left) and summer plumages; at the lower left is a pair of Red-backed Sandpipers in winter (left) and summer plumages; at the lower right is a pair of Sanderlings in summer (left) and winter plumages.

A. A. AGUES.

DISTRIBUTION IN FLORIDA.—Breeds commonly on all coasts and on the keys; winters in small numbers, chiefly in the southern half of the State. It is recorded in winter from Mosquito Inlet, December 24, 1927; Cedar Keys, January 29, 1920; Cortez, January 28, 1919 (20); Sebastian, February 8, 1919; Charlotte Harbor, January 13, 1924; and Royal Palm State Park, December 24, 1917. Eggs were taken at Sarasota Bay, April 25; Pass-a-Grille, May 16, 1907; Passage Key, May 18, 1911; Indian Key (date not recorded); Merritt Island, April 27, 1930; and Wakulla Beach, May 9, 1929. The birds were reported in the breeding season at St. Marks, Clearwater, Daytona Beach, Anastasia Island, Amelia Island, Lake Harney (four seen by D. J. Nicholson, June 4, 1915), Cudjoes Key (June, 1904), and Duck Keys (Audubon, 1835, vol. 3, p. 510). Scott (1889a, p. 158) records them in fall migration at Key West.

HAUNTS AND HABITS.—The Willet lives on the salt marshes and beaches along the coast, usually in colonies composed of several pairs. The nests are placed either on the beaches or in the marshes. Wayne (1910, p. 53) twice found them in South Carolina on top of a high sandhill, among wild oats, but usually they were located on the beach—"a hole scooped out in the ground at the foot of a bunch of grass near high water mark and lined with grass." D. J. Nicholson observed 3 nests on Merritt Island, May 12 and June 2, 1927, containing 3 and 4 eggs to a set. The nests, which were in the marsh, were concealed in clumps of salt-marsh grass (*Spartina*) or of *Salicornia*, and were composed of dried cakes of mud mixed with dead grass blades. A. H. Hardisty, in May, 1928, noted seven nests, containing 4 eggs each, in matted growths of "salt-cedar" (*Monanothochloe littoralis*) on this same island.

Audubon speaks of the Willet as at "all times a shy and wary bird," but I have found it comparatively unsuspicious and easily approached. It is usually vociferous, especially during the breeding season, when a person approaching its haunts is sure to be met by one or more of the birds, which circle about him, calling loudly *pill-will-willy*. The birds are strong flyers and in the air display the conspicuous white patches in the wings. They often alight on fence posts, bushes, or even large trees.

FOOD.—Examination of 34 stomachs of the Willet from Florida indicated that it feeds extensively on fiddler crabs and to a lesser extent on other crabs (*Sesarma cinereum* and *Neopanope texana*); its food comprises, also, small mollusks, crawfishes (*Cambarus fallax*), killifishes (*Fundulus*), diving beetles, leaf beetles, crickets, and grasshoppers.

WESTERN WILLET: *Catoptrophorus semipalmatus inornatus* (Brewster)

RECOGNITION MARKS.—Similar to the Eastern Willet, but larger (length, 15 to 17 inches; spread, 28 to 31 inches; bill, 2.25 to 2.75 inches).

RANGE.—Breeds from central Oregon, southern Alberta, southern Saskatchewan, and southern Manitoba south to northern California, Utah, Wyoming, Nebraska, and northern Iowa. Winters from northern California on the Pacific coast, and from the coasts of Texas, Louisiana, and Florida south to Ecuador, Peru, and the Galapagos Islands.

DISTRIBUTION IN FLORIDA.—Apparently a common migrant and winter resident, chiefly on the Gulf coasts. This bird being indistinguishable from the Eastern Willet in life, the records are necessarily limited to specimens in collections. The following speci-

mens have been recorded: Amelia Island, December 26, 1906; New Smyrna, March 28, 1877; Dummitts, February 15 and 16, 1869; Florida Keys, November 19, 1870; Tarpon Springs, August 10, 1886; Johns Pass (Boca Ciega Bay), May 15, 1918; Indian Pass, April 7 and May 6, 1926; and Davista, May 17 and 18, 1918.

HAUNTS AND HABITS.—The Western Willet has habits similar to those of the eastern form, and the two subspecies are often found together in migration.

GREATER YELLOW-LEGS: *Tótanus melanoléucus* (Gmelin)

OTHER NAMES: Winter Yellow-legs; Yelper; Tattler; Telltale Snipe

RECOGNITION MARKS.—About the size of the Willet (length, 12 to 15 inches; spread, 23 to 26 inches; bill, 2.00 to 2.30 inches); *legs and feet bright yellow. Spring plumage:* Upperparts fuscous or hair brown (dark drab), blotched with white, the neck streaked; *upper tail coverts white;* rump and tail barred with fuscous; underparts white, barred or streaked with fuscous. *Winter plumage:* Upperparts paler (mouse gray or hair brown); underparts less heavily streaked, mainly on neck and breast. (Plate 37.)

RANGE.—Breeds from southern Alaska (Lake Iliamna), southern Mackenzie, and northern Ungava (Fort Chimo) south to southern British Columbia, southern Manitoba, Newfoundland, and the Magdalen Islands. Winters from southern California, Texas, Louisiana, and South Carolina south to Patagonia.

DISTRIBUTION IN FLORIDA.—A common migrant and winter resident in all parts of the State. Moore (in Baird, Brewer, and Ridgway, 1884, vol. 1, p. 269) mentions this species as common all the year at Sarasota Bay, but not breeding. Atkins observed one bird at Key West, July 11, 1888, and found them common there on August 20, 1888. Migrants from the North were reported at Ponce Park, July 12, 1912; Pensacola, July 28, 1929; and Palma Sola, August 2, 1911. The species was recorded at Amelia Island, December 13, 1905 (common); St. Marks, January 21, 1916 (20); Tarpon Springs, January 6, 1890 (5 specimens); Lake Okeechobee, February 7, 1917 (about 100 in a flock of Lesser Yellow-legs); and Goose Creek, Wakulla County, December 29, 1921. A specimen was taken at Royal Palm Hammock, January 15, 1928. Late spring migrants were noted at New Smyrna, May 16, 1925; St. Marks, May 17, 1926; Port Richey, May 24 and 25, 1918; and Arcadia, June 6, 1920.

HAUNTS AND HABITS.—The Greater Yellow-legs resorts to shallow lagoons or mud flats along the coast and to pools on the marshes. The birds travel in flocks, usually announcing their presence with loud calls. When feeding, they wade rapidly about in shallow water with frequent tilting of the body, picking up insects, small fishes, or other food. They are very wary, and on the approach of danger quickly spring into the air and make off with loud cries, which alarm all the other denizens of the marsh. Their flight is swift and strong, the birds flying usually at a considerable elevation. They respond readily to an imitation of their notes, and if the hunter is well concealed, they often alight among the decoys.

FOOD.—The food of the Greater Yellow-legs consists mainly of small fishes, crustaceans, mollusks, and aquatic insects. Danforth (1926, p. 74) examined the stomachs of 3 birds taken in Porto Rico, finding in them dragon-fly naiads, aquatic bugs, and fish scales.

LESSER YELLOW-LEGS: *Tótanus flávipes* (Gmelin)

OTHER NAMES: Summer Yellow-legs; Yellow-leg Plover

RECOGNITION MARKS.—Smaller than the Greater Yellow-legs (length, 9 to 11 inches; spread, 19 to 21 inches; bill 1.30 to 1.55 inches), *with straighter bill;* coloration practically identical. (Plate 37.)

RANGE.—Breeds from Kotzebue Sound and the upper Yukon Valley, Alaska, northern Mackenzie, and southern Ungava south to southern Alberta, southern Saskatchewan, and central Quebec. Winters chiefly in Argentina, Patagonia, and Chile, and in smaller numbers north to Louisiana, Florida, and the Bahamas.

DISTRIBUTION IN FLORIDA.—A common migrant and locally common winter resident. South-bound migrants have been reported at Key West, July 16, 1888; Ponce Park, July 12, 1912; Pensacola, July 18, 1920; and James Island, July 20, 1901. Wintering birds have been noted at Goose Creek, Wakulla County, January 13, 1920; Pensacola, February 2, 1922; Daytona Beach, December 24, 1924; Wilson, January 1, 1921 (specimen); Magnolia, January 17, 1876 (specimen); Seven Oaks, January, 1911 (specimen); Kissimmee River, February 1, 1917 (15); Miakka River, February 7, 1922 (2 specimens); Caloosahatchee River, December 30, 1925; Royal Palm State Park, December 24, 1917 (7); Cape Sable, February 12, 1918 (4); and Lake Okeechobee, February 7, 1917 (about 300). The latest spring records are from the Tortugas, May 14, 1922; Daytona Beach, May 18, 1924; and Pensacola, May 25, 1924.

HAUNTS AND HABITS.—The Lesser Yellow-legs is very similar in both habits and appearance, except in size, to the Greater Yellow-legs. The birds travel in larger flocks and are usually less suspicious than the larger species. Their favorite haunts are shallow, brackish pools on the marshes or mud flats on the shores of bays or bayous, where they frequently associate with Dowitchers, Red-backed Sandpipers, and Semipalmated Sandpipers. Their mellow whistle of two notes is easily imitated and the birds respond readily to such a call, even returning to the same spot after some of their number have been killed or wounded. They are much less shy than the Greater Yellow-legs and may often be approached rather closely.

FOOD.—Examination of 9 stomachs of these birds taken in Porto Rico (Danforth, 1926, p. 75) showed the food to be nearly all animal matter, about one-fourth of which consisted of Dytiscid larvae, with smaller percentages of Hydrophilid larvae, bloodworms, beetles, snails, spiders, and grasshoppers. Wetmore (1916, p. 43), examining 4 stomachs from Porto Rico, found in them water boatmen and crustacean remains, including several crabs.

GREEN-SHANK: *Tótanus nebulárius* (Gunnerus)

RECOGNITION MARKS.—Similar in color to the Greater Yellow-legs, but slightly smaller; legs and feet dull greenish gray (Audubon); rump, flanks, and belly pure white, *without barring.*

RANGE.—Breeds in northern Europe and Asia. Winters from the Mediterranean and China to Australia and southern Africa. Accidental in Florida, Chile, and Argentina.

DISTRIBUTION IN FLORIDA.—This Old-World species is known in America from only a single record, made by Audubon on Sandy Key, off Cape Sable. Here, he tells us (1835, vol. 3, p. 483), on May 28, 1832, he shot 3 individuals standing close together. He says:

> I had at first supposed them to be Tell-tale Godwits [Greater Yellow-legs], as they walked on the bars and into the shallows much in the same manner, and, on obtaining them, imagined they were new; but

on shewing them to my assistant Mr. Ward, who was acquainted with the Greenshank of Europe, he pronounced them to be of that species, and I have since ascertained the fact by a comparison of specimens. They were all male birds, and I observed no material difference in their plumage.

A specimen in the United States National Museum collection bearing a label "Florida?", in Professor Baird's handwriting, is believed to be one of these birds, doubtless obtained by Baird from Audubon (see "Spencer Fullerton Baird" by W. H. Dall, p. 121, 1915). What became of the other two is not known. On the strength of Audubon's description and plate of this bird, it was named *Glottis floridana* by Bonaparte (1838, p. 51). Ridgway (1919, p. 329), however, has placed Bonaparte's name in the synonymy of *Glottis nebularia*. This occurrence seems very remarkable, especially in that three birds were found together so far from their normal range, but there seems to be no reason for doubting the facts as related by Audubon.

AMERICAN KNOT: *Calidris canútus rúfus* (Wilson)

OTHER NAMES: **Robin Snipe; Red-breasted Snipe; Grayback; Wah-quoit**

RECOGNITION MARKS.—About the size of the Robin (length, 10 to 11 inches; spread, 20 to 21 inches; bill, 1.25 to 1.5 inches); legs short, greenish black. *Spring plumage:* Upperparts and wings pale smoke gray, blotched and streaked with fuscous; underparts *solid cinnamon*. *Winter plumage:* Upperparts smoke gray; upper tail coverts white, with fuscous crossbars; underparts white, the breast faintly speckled with fuscous. (Plate 36.)

RANGE.—Breeds on the Arctic coasts and islands of both hemispheres, and winters in Africa, India, Australia, New Zealand, and South America south to Tierra del Fuego. Common in migration on the Atlantic coast and in the Mississippi Valley, rare on the Pacific coast. Rare or casual in winter on the Atlantic and Gulf coasts.

DISTRIBUTION IN FLORIDA.—Abundant in spring and fall on all coasts except the northern Gulf coast, where it is uncommon. Scott (1881, p. 19) recorded the species "common at Clearwater in February," and Pennock observed a flock of 20 or more birds at St. Marks Light, February 10, 1915. Migrants appear in spring in April, the earliest arrivals being noted first on the west coast, April 2, 1925 (Bent); at Estero Bay, April 9, 1917 (60 birds); Palma Sola Bay, April 17, 1925; and Shell Point, Wakulla County, April 27, 1918 (20). Two flocks seen at Daytona Beach, May 9, 1929, were estimated to number 600 birds. A few nonbreeding birds remain throughout the summer. Longstreet states that small flocks are occasionally seen at Daytona Beach in June and July (July 1, 15, and 28, 1923). I observed a flock of 6 at Fernandina, June 19, 1925. The fall migration begins in August (Pensacola, August 3, 1929; and Mosquito Inlet, August 10, 1912, August 12, 1925) and continues until late in November (west coast of Florida, November 26, 1924) or in December. Longstreet, at Daytona Beach, saw a flock on December 11, 17, 19, and 24, 1927.

HAUNTS AND HABITS.—Knots are gregarious and very sociable in their habits, flying swiftly in compact flocks, and turning in perfect unison. "On the ground they are rather deliberate in their movements, generally grouped in compact bunches and all moving along together" (Bent). They feed along the beaches on the Ocean and Gulf shores and to a lesser extent on mud flats or marshes, mingling freely with Turnstones, Black-bellied Plover, and Red-backed Sandpipers. Mackay (1893, p. 27) says: "They make two notes.

One is soft, of two articulations, and sounds like the word 'Wah-quoit' (by which name it is sometimes known on Cape Cod); although uttered low, it can be heard quite a distance. . . . The other is a single note resembling a little honk."

FOOD.—The food habits of the Knot have not been studied in detail. Mackay says he has found the larvae of cutworms in the throats of birds he has shot. Forbush (1912, p. 267) states: "They are fond of the spawn of the horsefoot crab, which often in company with the turnstone, they dig out of the sand. . . ." According to McAtee (1911b, pp. 4, 8), they destroy grasshoppers and marine worms.

PURPLE SANDPIPER: *Arquatélla maritima* (Brünnich)

OTHER NAMES: Rock Snipe; Winter Snipe; Rock Plover

RECOGNITION MARKS.—Slightly larger than the Sanderling (length, 8 to 9.5 inches; spread, 14 to 16 inches; bill, 1.00 to 1.45 inches), with longer, slenderer bill. *Darkest of the beach birds;* head dusky mouse gray, shading on back and tail to fuscous-black; breast mouse gray; belly white.

RANGE.—Breeds on the Arctic coasts and islands from Melville Island eastward to Greenland, Iceland, and northwestern Siberia. Winters from southern Greenland and Nova Scotia south to Long Island, and casually to the Bermudas, Georgia, and Florida.

DISTRIBUTION IN FLORIDA.—There are only two records from the State: Key Biscayne, October 29, 1857, specimen in United States National Museum, taken by G. Würdemann; Gordon's Pass (west coast, near Marco), November 1, 1886—specimen in the Museum of Comparative Zoölogy, taken by Thomas Hart and recorded by Scott (1889a, p. 156).

HAUNTS AND HABITS.—The Purple Sandpiper is a hardy species, wintering farther north than any other sandpiper. Its favorite haunts in winter are the rocks and ledges of the North Atlantic washed by the surf, where it feeds at low tide among the rockweed. Langille (1884, p. 528) says it occurs on the islands off the coast of Nova Scotia in flocks sometimes numbering 100 individuals. "When flying, and also when gleaning their food, they have a fine whistling twitter." The flocks will sometimes crowd together on a single rock.

Bent (1927b, p. 149) says of this species:

> The flight of the purple sandpiper suggests at times that of the spotted sandpiper, for when disturbed singly along the shore it is apt to fly out over the water with rapid downward wing strokes and, describing a large semicircle, return to the shore some distance ahead.

PECTORAL SANDPIPER: *Pisóbia melanótos* (Vieillot)

OTHER NAMES: Grass Snipe; Brownback; Marsh Plover; Meadow Snipe; Creaker; Jack Snipe

RECOGNITION MARKS.—Larger than the Sanderling; smaller than the Knot (length, 8 to 9.5 inches; spread, 15 to 18 inches; bill, 1 to 1.25 inches); upperparts fuscous-black, the feathers of head and back edged with tawny and cinnamon-buff; *rump dark;* tail mouse gray, *the middle feathers fuscous;* neck and breast heavily streaked with fuscous in spring plumage, clouded with buff in winter plumage.

RANGE.—Breeds on the Arctic coasts of Asia and North America from northern Siberia eastward to Cambridge Bay, Victoria Land, west coast of Hudson Bay, and possibly to northern Ungava. Winters in South America from Peru and Bolivia south to Argentina and Chile. Migrates chiefly along the Atlantic coast of North America and in the Mississippi Valley; rare on the Pacific coast.

DISTRIBUTION IN FLORIDA.—An uncommon migrant in spring, common in fall, occurring both on the coasts and in the interior. Migrants from the North were recorded at Pensacola, July 23, 1926; Key West, July 26, 1888; Canaveral, August 24, 1888; Punta Rassa, September 1, 1887; Arcadia, September 18, 1896; and St. Marks, September 24, 1913. Stoddard saw more than a hundred birds at Lake Jackson, September 10, 1927. The latest in fall were noted at Pensacola, October 20, 1929; Fernandina, October 23, 1906 (2 specimens); Lake Jackson, November 22, 1910; and Daytona Beach, November 19 to 21, 1924. Spring records are few in number—Cape Sable, March 11 to 14, 1924; Orange Hammock, Kissimmee River, March 14, 1895; Pass-a-Grille, March 14, 1925; May 7, 1928; St. Augustine, March 23, 1896; New Smyrna, April 10, 1918; Upper Matecumbe Key, April 15, 1910; and Key Biscayne Bay, May 3, 1919.

HAUNTS AND HABITS.—The Pectoral Sandpiper is a lover of wet, short-grass marshes. Although flying in flocks of considerable size, the birds after alighting scatter out over the marsh to feed singly or in pairs. They often lie close, crouching in the grass, flushing but little in advance of a person, and flying off in an erratic manner, much as the Wilson Snipe does. In flight they utter a low, broken note, *cree-ek*, which is apparently the origin of the name "Creaker" commonly applied to this species.

Describing the bird's habits, Bent (1927b, p. 176) says:

> The pectoral sandpiper has another snipe-like habit of standing motionless in the grass, relying on its concealing coloration, where its striped plumage renders it almost invisible, even in plain sight. It moves about slowly while feeding, probing in the mud with rapid strokes. Often it stands perfectly still with its head held high, watching an intruder. . . . It is occasionally seen swimming across a narrow creek or channel.

FOOD.—Examination of 21 stomachs of this species taken on the Pribilof Islands (Preble and McAtee, 1923, p. 72) showed its food to consist of Diptera (mainly crane flies), 54.5 per cent; amphipods, 22.3 per cent; vegetable matter (chiefly algae), 10.5 per cent; beetles, 8 per cent; Hymenoptera (parasitic wasps), 2.1 per cent; and bugs, 1.3 per cent. Hatch (1892, p. 125), writing of this sandpiper in Minnesota, states that the birds feed in spring principally upon crickets, and in the fall on grasshoppers.

WHITE-RUMPED SANDPIPER: *Pisóbia fuscicóllis* (Vieillot)

OTHER NAME: **Bonaparte's Sandpiper**

RECOGNITION MARKS.—Larger than the Semipalmated Sandpiper; smaller than the Pectoral Sandpiper (length, 6.75 to 8 inches; spread, 14 to 16.5 inches; bill, .85 to 1.00 inch); *upper tail coverts white. Winter plumage:* Upperparts mouse gray, sparingly blotched with fuscous; underparts white, the breast clouded with drab. *Summer plumage:* Upperparts mainly fuscous-black with cinnamon-buff edgings; breast more heavily spotted.

RANGE.—Breeds along the Arctic coasts from northwestern Mackenzie to Cumberland Sound, Baffin Island. Winters in South America from Paraguay and Argentina to the Falkland Islands. Migrates through the United States east of the Rocky Mountains.

DISTRIBUTION IN FLORIDA.—Occurs rarely in migration on both coasts; recorded several times in winter. Audubon (1835, vol. 3, p. 529) reports the capture of two specimens at St. Augustine, December 2, 1831, from which he made the drawing for his plate.

Scott (1881, p. 19) mentions a single record made at Clearwater in February, but since he omits any reference to this in his later summary of observations (1889a, p. 157), it may be dismissed as doubtful. Savage and Eaton reported two birds seen near St. Petersburg, February 5, 1930.

The species is a late migrant in spring. Specimens were taken on the Indian River, by C. J. Maynard, May 10, 1886; at Mosquito Inlet, by R. J. Longstreet, May 9, 1926; at De Funiak Springs, by G. Clyde Fisher, May 12, 1908; on Amelia Island, by W. W. Worthington, May 30, 1906; and at Key West by J. W. Atkins, June 11, 1888. A specimen in the British Museum taken at Tarpon Springs, June 12, is recorded by Sharpe (1896, vol. 24, p. 577). Fargo (1926, p. 147) reported a few birds seen in Pinellas County, May 14 and 15, 1926; and H. L. Stoddard saw one at Wakulla Beach, May 9, 1929. In the fall migration, an early arrival was noted by Mrs. Byrd at Bradenton, July 12, 1925, and others were observed by Miss Earle at Palma Sola, August 27 and September 11, 1911. One bird struck Sombrero Key Light, May 20, 1887 (identified by A. K. Fisher).

HAUNTS AND HABITS.—The White-rumped Sandpiper is a size smaller than the Pectoral Sandpiper, and may be distinguished in flight by the white upper tail coverts. The birds in migration frequent sandy and rocky beaches, and shallow pools in the salt marshes or on the uplands, appearing in small companies of their own species or with other small sandpipers. Their note is described as "an exceedingly sharp, squeaky, mouse-like *jeet* uttered on the wing, unmistakable" (J. T. Nichols, quoted by Forbush). Brewster (1925, p. 245) says of this species:

> Invariably among the tamest and most confiding of our so-called shore birds, they will usually permit one to approach, either on foot or in a boat, within 5 or 6 yards . . . they are habitually sluggish, confining their wanderings afoot to limited areas, and exploiting these very deliberately, walking slowly and sedately in crouching attitudes, with measured steps, frequently stopping to thrust their bills listlessly a little way into the soft ground, or to pick up small morsels of food from the surface. . . . Although somewhat loath to take wing, even when threatened by obvious danger, they are likely to fly swiftly and far, when once started, doubling and circling over the marshes in much the same manner as other small sandpipers.

FOOD.—Little is available relative to this bird's food habits. Danforth (1926, p. 71), who examined 4 stomachs collected in Porto Rico, found the food to consist of animal matter, 77.7 per cent, and vegetable matter, 22.3 per cent. About half of the animal matter was composed of bloodworms, and about one-fourth of small snails. The vegetable matter consisted entirely of seeds. McAtee (1911b, p. 4) has shown that this species eats grasshoppers, marine worms, and the clover-root curculio.

BAIRD'S SANDPIPER: *Pisóbia bâirdi* (Coues)

OTHER NAMES: **Bull-peep; Grass Bird**

RECOGNITION MARKS.—About the size of the White-rumped Sandpiper (length, 7 to 7.5 inches; spread, 15 to 16.5 inches; bill, .75 to 1.00 inch); very similar in appearance, but *upper tail coverts fuscous;* upperparts and *chest shaded with buff*, the latter less heavily spotted.

RANGE.—Breeds along the Arctic coast from northwestern Alaska to Baffin Island, and probably to Greenland. Winters in Chile, Argentina, and Patagonia. Migrates chiefly through the Mississippi Valley, and irregularly on the Atlantic and Pacific coasts.

DISTRIBUTION IN FLORIDA.—The first record of this species in the State was made by W. G. Fargo, between May 12 and 15, 1926, at Maximo Point, Tampa Bay, where he several times saw 5 Baird's Sandpipers in company with White-rumped, Semipalmated, and Least Sandpipers. On one occasion he was able to approach behind some bushes to within 15 feet of the birds and study them at his leisure. At Pensacola, April 22, 1928, Francis M. Weston collected a specimen, which is now in the United States Biological Survey collection (Weston and Smith, 1928, p. 370); on May 2, 1931, in the same locality, Weston observed a bird of this species in a flock of Least and White-rumped Sandpipers.

HAUNTS AND HABITS.—During its migrations Baird's Sandpiper, according to Bent, feeds on open mud flats with other species of sandpipers, but seems to prefer feeding about the edges of shallow inland pools or where the muddy flats are partially overgrown with grass. Dr. C. W. Townsend describes the note of Baird's Sandpiper as "exactly like that of the Semipalmated Sandpiper, a rather shrill, trilling whistle."

LEAST SANDPIPER: *Pisóbia minutílla* (Vieillot)

OTHER NAMES: **Marsh-peep; Meadow Oxeye; Mud-peep**

RECOGNITION MARKS.—The smallest of the Sandpipers (length, 5 to 6.75 inches; spread, 11 to 12 inches; bill, .65 to .95 inch); distinguished from the Semipalmated Sandpiper by its *yellowish green legs* and darker, more reddish upperparts, which are fuscous-black, edged with tawny; chest faintly spotted with fuscous or dark drab in spring, clouded with buff in winter. (Plate 38.)

RANGE.—Breeds from northwestern Alaska and the Arctic coast of Mackenzie south to southern Yukon, Hudson Bay (Fort Churchill), Newfoundland, and Nova Scotia. Winters from southern California, southern Arizona, southern Texas, and North Carolina south to Brazil and Patagonia.

DISTRIBUTION IN FLORIDA.—Common in all parts of the State from late in July to late in May; locally abundant in migration. Individuals are occasionally seen during June, these probably being nonbreeding birds that remain through the summer. Pennock found the birds numerous at Shell Point, Wakulla County, June 25, 1913, and Miss Earle reported them at Palma Sola on July 9, 1911, July 14, 1910, and July 19, 1909. Weston noted the first fall migrants at Pensacola on July 26, 1925, and July 21, 1929, and the last seen in spring on May 10, 1926. Longstreet reported the last birds seen in spring at Daytona Beach, May 18, 1924, and Scott recorded them as abundant near Punta Rassa from May 13 to 25, 1886. I found them common in the mangrove swamps at Cape Sable, March 27 to 31, 1926, and noted a flock of 100 or more on the shores of Lake Hicpochee, April 19, 1919. A winter record is furnished by our observation of a flock of 10 at Goose Creek, Wakulla County, January 6, 1920. Fargo (1926, p. 147) reports the species "exceedingly common" in Pinellas County from January 11 to May 17, 1926.

HAUNTS AND HABITS.—The Least Sandpiper frequents mud flats and the borders of shallow pools both on salt marshes and in flooded fields on the uplands. It is quite common, also, along the seashore. The little "peeps" are probably the most unsuspicious of all the shore birds, and with ordinary caution they may be approached closely. They travel in flocks, sometimes of their own kind, but often associated with Semipalmated and other small sandpipers. On marshes they scatter widely, and single birds

are frequently flushed. Their notes in flight are said to be distinctive, and are described as a plaintive *wheet-wheet* or a grating *kreep.*

FOOD.—Examination of 18 stomachs from Alabama showed the contents to consist chiefly of larvae or pupae of small flies, with a few bits of aquatic beetles (Howell, 1924, p. 101). In a single stomach from Porto Rico, Wetmore (1916, p. 44) found the heads of more than 100 minute fly larvae and fragments of small beetles.

RED-BACKED SANDPIPER: *Pelidna alpina sakhalina* (Vieillot)

OTHER NAMES: **American Dunlin; Leadback; Blackbreast**

RECOGNITION MARKS.—Slightly larger than the Sanderling (length, 7.5 to 9.25 inches; spread, 14.5 to 16 inches; bill, 1.38 to 1.73 inches), with much longer bill, *curved downward toward the tip. Spring plumage:* Top of head and back cinnamon, with fuscous-black markings; rump hair brown (dark drab); tail smoke gray, the middle upper coverts fuscous; *belly fuscous-black. Winter plumage:* Upperparts mouse gray; belly white; breast faintly clouded with smoke gray. (Plate 38.)

RANGE.—Breeds on the northern coast of Siberia, the northwestern coast of Alaska, in northeastern Mackenzie (Cape Fullerton to Boothia Peninsula), and northeastern Ungava. Winters on the Pacific coast from Washington to southern Lower California, and on the Atlantic and Gulf coasts from New Jersey to Florida and Texas.

DISTRIBUTION IN FLORIDA.—Abundant migrant and winter resident in northern and central Florida as far south as Punta Rassa, at the mouth of the Caloosahatchee River, and the Indian River (St. Lucie) on the east coast. Migrants from the North were noted at Mullet Key (Tampa Bay), July 26, 1914; St. Marks, August 9, 1917; and Pensacola, August 26, 1919. In the spring the birds remain until the last of May, and occasionally into June. Scott (1887b, p. 219) recorded them as abundant near Punta Rassa, May 13 to 25, 1886, and noted small flocks at Johns Pass (Boca Ciega Bay), June 2, 1886 (1889a, p. 157). Pennock observed the species at St. Marks, May 26, 1919, and Ingersoll reported it from New Smyrna, May 26, 1924. Weston records this species as a common winter resident at Pensacola, and M. S. Crosby mentions about 150 birds seen at St. Augustine, February 6, 1924. We counted more than 200 on the beach near Mosquito Inlet, May 8, 1929. Apparently the Redback does not winter in any numbers in extreme southern Florida; it has not been recorded from the Cape Sable region or from Key West. There are, however, two specimens in the Museum of Comparative Zoölogy that were taken by Maynard on the Florida Keys, November 15 and 22, 1870, and Nichols (1918, p. 22) reports two or three seen on bars about 12 miles south of Sanibel Light, April 9, 1917.

HAUNTS AND HABITS.—The Red-backed Sandpiper frequents sandy beaches and mud flats along the shores of bayous and creeks, feeding in shallow pools left by the receding tide. The birds occur in flocks sometimes numbering 50 to 100 individuals, and are often associated with Dowitchers, Lesser Yellow-legs, and Semipalmated Sandpipers. In feeding, they wade about in the shallow water, probing the soft mud and sometimes submerging their heads in their search for food. They are not particularly shy, and when frightened usually fly but a short distance. During the winter months they wear a dull grayish plumage, which in spring is changed for a brilliant reddish brown on the back with strongly contrasting black belly.

Townsend (1905, p. 176) says of this bird's voice: "Their call note is distinctive, and resembles somewhat the word *purre*, by which name the European species is called. The note is plaintive and sometimes melodious, and recalls, without its harshness, the cry of the common tern."

Food.—According to Bent (1927b, p. 225)—

> Their food consists of small mollusks, sand fleas, and other small crustaceans, amphipods, flies, and other insects and their larvae, diving and other aquatic beetles, marine worms, and occasionally a few seeds of aquatic plants.

EASTERN DOWITCHER: *Limnódromus griseus griseus* (Gmelin)

Other Names: Red-breasted Snipe; German Snipe; Brownback

Recognition Marks.—About the size of Wilson's Snipe (length, 10 to 12.5 inches; spread, 17.5 to 20 inches; bill, 2 to 2.5 inches). *Spring plumage:* Underparts pinkish cinnamon, spotted with fuscous; upperparts fuscous-black, mottled with buffy white and pinkish cinnamon; rump white, the upper tail coverts barred with fuscous. *Winter plumage:* Upperparts hair brown; breast clouded with pale smoke gray. (Plate 36.)

Range.—Breeding area unknown, supposed to be the Ungava Peninsula. Occurs commonly in migration in eastern North America and winters from South Carolina and northern Florida south through the West Indies to northern South America.

Distribution in Florida.—A common winter resident and abundant spring and fall migrant chiefly along the coasts but occasionally also on interior lakes and ponds; small numbers of nonbreeding individuals sometimes remain during the summer. Migrants from the North appeared at Fernandina, July 17, 1906; Pensacola, July 18, 1926, August 28, 1921; St. Marks, July 30, 1919; Bradenton, July 31, 1924; Mullet Key (Tampa Bay), August 4, 1920; Cape Canaveral, August 20, 1888; and Stirrup Key, August 23, 1926. In spring, migrants have been noted at Pavilion Key, March 30, 1922 (200 or more); Bassenger, April 1, 1907; Lake Hicpochee, April 19, 1919 (flock of 50 or more); Madeira, Boca Ciega Bay, May 15, 1929; St. Marks, May 26, 1919; and Indian Pass, Manatee County, June 6, 1918.

Scott (1889a, p. 156) states that Dowitchers have been observed in the vicinity of Tarpon Springs every month during the year and are not at all rare during the months of June, July, and August. The specimens that he took indicated the birds to be nonbreeders. J. W. Atkins reported the species common at Key West on June 11 and 14, 1888. C. J. Pennock observed 50 or more birds at Shell Point, Wakulla County, June 6, 1915, and collected one there on June 24, 1913.

Haunts and Habits.—Dowitchers resort to the tidal flats and mud bars to feed, where they associate with various other sandpipers and plovers. They are strongly gregarious and always fly in compact flocks, in perfect unison, almost as one bird. Usually they are quite unsuspicious, and as a result have suffered severely from the persecution of hunters. Their note, uttered in flight, is described as a soft, rather abrupt whistle.

Food.—The food habits of the Dowitcher have not been studied in detail; it has been reported to feed on grasshoppers, beetles, flies, larvae, marine worms, leeches, water bugs, fish eggs, small mollusks, seeds of aquatic plants, and the roots of eelgrass (Bent, 1927b, p. 110).

LONG-BILLED DOWITCHER: *Limnódromus grîseus scolopâceus* (Say)

OTHER NAME: White-tailed Dowitcher

RECOGNITION MARKS.—Closely similar to the Eastern Dowitcher, but bill averaging longer (2.10 to 3.00 inches).

RANGE.—Breeds in northern Alaska and northern Mackenzie. Winters from the Gulf of Mexico south to Central America, and probably northern South America. Occurs in migration throughout the Mississippi Valley and westward, and on the Atlantic coast from southern New England southward.

DISTRIBUTION IN FLORIDA.—Apparently occurs in suitable situations throughout the State, but as it is not distinguishable in the field from the common Dowitcher, there are comparatively few records. Scott (1881, p. 19; 1888b, p. 184) records it common near Tarpon Springs in fall and early winter and abundant at Panasoffkee Lake. Specimens have been examined from Canaveral, April 15, 1889; Kissimmee River, February 15, 1893; Indian River, April 10, 1886; Fort Bassenger, March 1, 1896; Clearwater Harbor, May 21, 1918; Lake Hicpochee, April 19, 1919; Pinellas County, June 2, 1903; Puzzle Lake, April 10, 1905; and Pensacola, October 21, 1928.

HAUNTS AND HABITS.—This race has the same habits as the typical form (*griseus*), with which it is often found associated.

STILT SANDPIPER: *Micropâlama himântopus* (Bonaparte)

OTHER NAMES: Bastard Yellow-legs; Greenleg; Stilt

RECOGNITION MARKS.—About the size of the Red-backed Sandpiper (length, 7.5 to 9 inches; spread, 15.5 to 17 inches; bill, 1 to 1.75 inches); *legs longer, greenish yellow; bill broadened at the tip. Winter plumage:* Much like the Red-backed Sandpiper, but *upper tail coverts white;* upperparts mostly mouse gray; underparts white, the neck and breast faintly streaked with gray. *Summer plumage:* Entire underparts *barred crosswise* with fuscous.

RANGE.—Breeding area not definitely known, probably the Barren Grounds from the mouth of the Mackenzie River to the western shores of Hudson Bay. Winters in South America south to Uruguay and Chile, and rarely in Louisiana. Occurs in migration on the Atlantic coast to North America and in the interior as far west as the eastern edge of the Great Plains.

DISTRIBUTION IN FLORIDA.—Occurs in moderate numbers in spring and fall on the east coast and rarely on the Gulf coast. Hoxie found the birds numerous at Cape Canaveral, August 20 to 29, 1888, and took 5 specimens, which are now in the British Museum (Sharpe, 1896, p. 404). Longstreet (1926b, p. 379) observed 3 at Port Orange, May 4 and 5, 1925. In the Museum of Comparative Zoölogy there are specimens that were taken as follows: New Smyrna, March 26, 1877; Indian River, April 3 and 15, 1886; Dummitts, April 4, 1889; Merritt Island, February 22, 1889 (2); Banana Creek, March 10, 1890 (5); and Key West, September 16, 1889. Scott (1889a, p. 156) never found the species on the Gulf coast, but mentions a specimen taken by J. W. Atkins at Key West, November 1, 1888. N. B. Moore saw several individuals at Sarasota Bay, August 4 and September 17, 1869 (Baird, Brewer, and Ridgway, 1884, vol. 1, p. 201). Stoddard collected a specimen at Lake Jackson, Leon County, October 8, 1927. Weston noted a single bird in a bunch of Lesser Yellow-legs at Pensacola, April 5, 1925, and took a specimen there, October 10, 1926. He saw 4 birds in a roadside pond with Lesser Yellow-legs, September 30, 1928.

HAUNTS AND HABITS.—The Stilt Sandpiper frequents tidal flats in the bays along the coast and shallow pools in the interior, associating with Lesser Yellow-legs or with smaller sandpipers. The birds wade about in shallow water, and frequently plunge their heads beneath the surface in search of food. H. L. Stoddard says this Sandpiper may be distinguished from the Lesser Yellow-legs by its rapid probing method of feeding.

N. B. Moore, who lived on Sarasota Bay, thus describes the feeding habits of the Stilt Sandpiper (Bent, 1927b, p. 125):

> It alighted within 20 feet of me and commenced feeding at once, in water that nearly covered the tarsi. I was surprised to see it slowly step along, carrying its bill immersed nearly up to the base, and sweeping it slowly from side to side, much in the manner of the roseate spoonbills, which were at the same moment feeding near by. I noticed no action like that of swallowing at any time, its motions being continuous—as described—until I shot it to make sure of the species.

Concerning this species, J. T. Nichols says:

> On the wing the stilt sandpiper resembles the lesser yellowlegs closely. . . . On the ground the stilt sandpiper stands lower than a yellowlegs, having decidedly shorter legs, and correspondingly higher than our other shore birds of the same size. The color of its legs, dull olive green, is usually diagnostic. . . . The common flight note of the stilt sandpiper is very like the single whistled *whu* of the lesser yellowlegs, but recognizably lower pitched and hoarser, at times with a quaver. . . .

FOOD.—Danforth (1926, p. 70), reporting on 7 stomachs of this species collected in Porto Rico, states that the contents consisted of animal matter, 70.1 per cent, and vegetable matter, 29.9 per cent. "Bloodworms (Chironomid larvae) were the largest food item, forming 72.8 per cent of the animal food. From 150 to 600 bloodworms were found in all but two of the stomachs." Dytiscid larvae formed 15.5 per cent, and small snails 7 per cent, of the animal matter. The vegetable matter consisted of seeds.

SEMIPALMATED SANDPIPER: *Ereunêtes pusillus* (Linnaeus)

OTHER NAMES: Sand-peep; Oxeye

RECOGNITION MARKS.—About the size of the Least Sandpiper (length, 5.5 to 6.75 inches; spread, 11 to 12.5 inches; bill, .50 to .90 inch), and very similar in appearance; bill slightly stouter; *legs and feet black;* upperparts fuscous or fuscous-black, edged with smoke gray and lacking the tawny markings of the Least Sandpiper. (Plate 38.)

RANGE.—Breeds from the Arctic coasts of Alaska and Mackenzie south to James Bay, Labrador, and Newfoundland. Winters from the coast of South Carolina and the northern Gulf coast south to Patagonia. Migrates chiefly through North America east of the Rocky Mountains.

DISTRIBUTION IN FLORIDA.—Abundant in migration and during the greater part of the year (excepting June), chiefly on the sea coasts. Small numbers of nonbreeding birds remain throughout the summer even as far south as Key West (Scott, 1889a, p. 157). Pennock found the birds numerous on the coast of Wakulla County, June 11, 17, and 24, 1913, and Longstreet has seen small flocks at Daytona Beach during June. Migrants from the North are recorded at Fernandina, July 14, 1906; Daytona Beach, July 1, 1923 (200); Pensacola, July 17, 1920; and Palma Sola, July 10, 1912. From July to April the species occurs in abundance. A flock numbering 500 or more was seen

at Caxambas, March 30, 1919. The bulk of the birds depart for the breeding grounds during the latter half of May.

HAUNTS AND HABITS.—The Semipalmated Sandpiper is a familiar inhabitant of the ocean beaches, and of the mud flats in the bayous and on the salt marshes. The little birds feed in company with Least Sandpipers, Red-backed Sandpipers, Sanderlings, and other beach birds along the edge of the surf on the receding tide, or in shallow pools on the marshes or flats. They fly in compact flocks, twisting and turning in perfect unison, alternately showing their grayish backs and white breasts. They resemble the Least Sandpiper closely, but are slightly larger and have blacker legs. Their call notes are similar to those of the Least Sandpiper—a shrill *to-weet'*; when in flocks they utter a series of peeping notes. Doctor Townsend speaks of a low, rolling, gossipy note often given when they approach other birds or decoys.

FOOD.—Bent (1927b, p. 248) records the following items found in stomachs examined by him: Insects of various kinds, including beetles; small mollusks; worms; crustaceans; and bits of seaweed. Wetmore (1916, p. 43) examined the contents of 6 stomachs taken in Porto Rico, finding beetles, bugs, fly pupae, and small mollusks. Fly pupae formed 21 per cent; snails, 13 per cent; and miscellaneous animal matter, 12.5 per cent of the total food.

WESTERN SANDPIPER: *Ereunetes mâurii* Cabanis

RECOGNITION MARKS.—About the size of the Semipalmated Sandpiper, but with *longer and slenderer bill* (.83 to 1.25 inches). *Spring plumage:* Upperparts rather heavily marked with tawny or russet. *Winter plumage:* Upperparts mouse gray; underparts chiefly white. (Plate 38.)

RANGE.—Breeds on the northwestern coast of Alaska. Winters from Washington south to Venezuela and Peru, and from North Carolina to Florida. Occurs as a migrant both on the Pacific coast and on the Atlantic coast from New Hampshire southward.

DISTRIBUTION IN FLORIDA.—A common migrant and winter resident on both coasts. Specimens have been examined from Amelia Island, New Smyrna, Florida Keys (November and December, 1870), Caxambas, Seven Oaks (near Clearwater), Johns Pass (Boca Ciega Bay), Pass-a-Grille, and Goose Creek, Wakulla County. At the last-mentioned locality about 40 birds were shot, January 6, 1920, from a flock estimated to contain about 500, and nearly all proved to be of this species. Pennock took specimens at Shell Point, Wakulla County, June 24, 1913, and June 11, 1919. Weston reports the birds common at Pensacola, noting their arrival there July 27, 1929.

HAUNTS AND HABITS.—The Western Sandpiper frequents the same situations and has practically the same habits as its eastern representative, the Semipalmated Sandpiper. By reason of the close similarity between the two species, it is impossible to say which is the more common species on the Florida coasts. Nichols stated, however (Bent, 1927b, p. 262), that on the northwestern coast of Florida this species greatly outnumbered the Semipalmated.

FOOD.—Little is known in detail of the food habits of this Sandpiper. Stomachs of 6 birds collected in Alabama contained minute fly larvae, aquatic beetles and bugs, marine worms, and small snails. Danforth (1926, p. 73) found 150 bloodworms in the stomach of a bird taken in Porto Rico.

BUFF-BREASTED SANDPIPER: *Tringites subruficollis* (Vieillot)

OTHER NAMES: Hill Grassbird; Cherook

RECOGNITION MARKS.—About the size of the Red-backed Sandpiper (length, 7.5 to 8.5 inches; spread, 16 to 17 inches; bill, .67 to .75 inch); bill much shorter, straight, rather slender. *Summer plumage:* Upperparts mainly blackish brown, the feathers edged with crescentic bands of white; sides of head and neck cinnamon-buff; underparts pinkish buff; sides of breast thinly spotted with fuscous; lining of wings *marbled with fine fuscous dots. Winter plumage:* Underparts whitish, washed on breast with pale pinkish buff.

RANGE.—Breeds on the Arctic coasts of northern Alaska and Mackenzie east probably to Hudson Bay. Winters in Argentina and Uruguay. Most abundant in migration in the Mississippi Valley; rare on the Atlantic coast as far south as Long Island.

DISTRIBUTION IN FLORIDA.—Known from only two records by H. L. Stoddard, who collected three specimens at Lake Jackson, Leon County, September 12 and 13, 1926, and April 7, 1928; two other birds were seen on the last date.

HAUNTS AND HABITS.—Bent (1929, p. 74) says of this bird:

> Much of the behavior of the buff-breasted sandpiper, while on the ground, reminds one of the upland plover; it seems to prefer the grassy places rather than the open flats or shores, and often runs away to hide in the grass rather than fly; in running it lifts its feet rather high, as if accustomed to walking through grass; and it often stops and stands with its neck stretched up looking at the intruder, just as the upland plover does.

Concerning these birds as observed in Minnesota, Hatch writes (1892, p. 143):

> They are an extremely active species when on the wing, and essentially ploverine in all respects, seeking sandy, barren prairies, where they live upon grasshoppers, crickets, and insects generally, and ants and their eggs specially. . . . The flight is in rather compact form, dipping and rising alternately, and with a disposition to return again to the neighborhood of their former feeding places.

One of the birds collected by Stoddard at Lake Jackson was with Killdeers in a pasture on a hill, the other with a Pectoral Sandpiper at the water's edge.

MARBLED GODWIT: *Limosa fedoa* (Linnaeus)

OTHER NAMES: Brown Marlin; Straight-billed Curlew

RECOGNITION MARKS.—Larger than the Willet (length, 16 to 20 inches; spread, 30 to 40 inches; bill, 3.5 to 5 inches), with very long, *slightly upturned bill.* Underparts light pinkish cinnamon (rather heavily barred with fuscous in spring plumage), paling to light buff or white on throat; upperparts fuscous, blotched with pinkish cinnamon.

RANGE.—Breeds from Alberta, Saskatchewan, southern Manitoba, and James Bay south to southern North Dakota (formerly Utah, Nebraska, Iowa, and Wisconsin). Winters from central California, Louisiana, and Georgia south to Ecuador and Peru (formerly Argentina).

DISTRIBUTION IN FLORIDA.—Formerly an abundant migrant and winter resident; now rare. Audubon (1835, vol. 3, p. 288) mentions an "immense number" found on Sandy Key, off Cape Sable, May 31, 1832. Scott (1881, p. 19; 1889a, p. 157) reported it common at Punta Rassa, Clearwater, and the mouth of Withlacoochee River, occurring throughout the year, but more abundantly in winter. Moore (in Baird, Brewer, and Ridgway, 1884, vol. 1, p. 255) recorded the species as present in small numbers at Sarasota Bay all summer, but not breeding, and Maynard (1881, p. 397) reported it abundant

in winter from Amelia Island south to Merritt Island and at Cedar Keys, and uncommon at Miami.

Specimens of this bird have been examined from Indian Key (March 18, 1857); Charlotte Harbor (February 22, 1859); Gasparilla Pass (February 5, 1884); New Smyrna (February 21 and 23, 1876); Cedar Keys (winter, 1876); Jacksonville (February 15, 1869); Dummitts (February, 1869); and Miami (about 1870, Maynard and Henshaw).

Recent records are few in number. Pennock shot a specimen near St. Marks, September 16, 1919. Worthington saw 5 birds on Amelia Island, April 25, 1906, and noted the species again on May 15. Fargo (1926, p. 148) records one seen at Pass-a-Grille, March 2, 1925, and one at Cedar Keys, February 19, 1923. I saw a single bird at the latter place, January 28, 1920, and two near St. Petersburg, May 15, 1929. Weston reported one seen near Pensacola, October 7, 1928, and Longstreet noted three at Mosquito Inlet, September 24, 1929.

HAUNTS AND HABITS.—Audubon's account (1835, vol. 3, p. 287) of the habits of the Marbled Godwit, as observed by him on the Florida Keys in 1832, is well worth quoting:

> This fine bird is found during winter on all the large muddy flats of the coast of Florida that are intermixed with beds of raccoon oysters. As the tide rises it approaches the shores, and betakes itself to the wet savannahs. At this season it is generally seen in flocks of five or six, searching for food in company with the Tell-tale, the Yellow-shanks, the Long-billed Curlew, and the White Ibis. While feeding, it probes the mud and wet sand, often plunging its bill to its whole length, in the manner of the Common Snipe and the Woodcock. It is fond of the small crabs called fiddlers, many of which it obtains by probing their burrows, and running after them along the edges of the salt meadows and marshes. Sometimes you see it wading in the water up to its body, and when about to lose ground, it rises and extends its wings, still continuing to search for fry, until forced to fly off by the increased depth of the water, when it alights on the shore and recommences its operations. While feeding on the banks, it appears to search for food between and under the oysters with singular care, at times pushing the bill sidewise into the soft mud beneath the shells. Towards the middle of the day, the separate flocks come together, assembling on some large sand-bar, where they remain for hours, trimming their plumage, after which many of them continue some time motionless, standing on one leg.

This Godwit is described as having a great variety of striking and characteristic notes. Its ordinary call note, says Bent (1927b, p. 284), sounds like *ter-whit, ter-whit, ter-whit,* strongly accented on the last syllable. During migration and in winter the birds are mostly silent.

FOOD.—The food of the Marbled Godwit, as indicated by examination of a large number of stomachs in the Biological Survey, comprises diving beetles, carabid beetles, weevils, fly larvae, caddis-fly cases, grasshoppers, May flies, small crustaceans, mollusks, roundworms (*Nereidae*), seeds and tubers of pondweed (*Potamogeton*), seeds of sedges, and bulbs of musk grass (*Chara*).

SANDERLING: *Crocéthia álba* (Pallas)

OTHER NAMES: **Beach Bird; Beach Snipe; White Snipe; Whiting**

RECOGNITION MARKS.—Smaller than the Red-backed Sandpiper or the Knot (length, 7 to 8.75 inches; spread, 14 to 16.25 inches; bill, .88 to 1.20 inches); bill straight, black. *Winter plumage:* Upperparts smoke gray, head nearly white; underparts pure white; in this plumage it is the palest of the beach

sandpipers. *Spring plumage:* Upperparts light pinkish cinnamon, blotched with fuscous; throat and breast cinnamon, spotted with hair brown. (Plate 38.)

RANGE.—Nearly cosmopolitan. Breeds on the Arctic coasts and islands from Point Barrow, Alaska, to Greenland; also in Iceland, Spitzbergen, and northern Siberia. Winters on the Pacific coast from central California (rarely Washington), and on the Atlantic coast from New Jersey (rarely Massachusetts), southward to Chile and Argentina. Migrates along our sea coasts and across the larger lakes of the interior.

DISTRIBUTION IN FLORIDA.—A common migrant and winter resident on all coasts; occurs in every month of the year, but only a few nonbreeding birds remain through June. Longstreet reported the species at Daytona Beach, June 14 and 22, and July 2 and 11, 1925; Weston saw a flock of 6 on Santa Rosa Island, June 25, 1922. Migrants from the North usually appear in July (Pensacola, July 21, 1929) and are common by the first of August. The birds are found throughout the fall and winter in moderate numbers, and in spring occur in abundance. Scott records two small flocks on the Tortugas in March and April, 1890, and large numbers near Punta Rassa, May 13 to 25, 1886. J. T. Nichols estimated about 500 on the beaches 12 miles south of Sanibel Light, April 9, 1917. I found the birds numerous at Mosquito Inlet, May 17 to 22, 1925, and at East Pass (Choctawhatchee Bay), April 23, 1926. About 20 birds were noted at Goose Creek, Wakulla County, January 6, 1920. McAtee reported them very common on St. Vincent Island, October 29 to November 9, 1910, and Worthington found them numerous on Amelia Island, December 3 to 20, 1905. Bayard Christy saw one on the Tamiami Trail, near Miami, February 20, 1927, and we observed about 35 on sand bars in the Kissimmee River, near the south end of Lake Kissimmee, on May 12, 1929.

HAUNTS AND HABITS.—Sanderlings are well named, for they are true beach birds and are rarely found away from the sea coast. Their food is procured from the edge of the surf, the little birds running nimbly out in the wake of the receding wave and probing the soft sand with their bills in search of the minute insects or crustaceans that form their principal diet. If overtaken by the next incoming wave, they rise lightly and flutter a short distance to a place of safety. If pursued, they run with considerable speed along the beach, but if hard pressed will take flight and circle out over the surf. They occur usually in small flocks, often in company with other species of sandpipers. In their winter plumage they are the palest of the shore birds and in flight display prominent white bars on the wings. Their notes are not loud, and are described as "*ket, ket, ket,* uttered singly or in a series and in a slightly complaining tone" (J. T. Nichols). They have, also, a plaintive whistle similar to that of the Semipalmated Sandpiper.

FOOD.—The food of the Sanderling, according to Bent (1927b, p. 272), "consists mainly of sand fleas, shrimps, and other small crustaceans, small mollusks, marine worms, flies, fly larvae and other insects, and sometimes a few seeds." He quotes Doctor Townsend as follows: "I have seen sanderlings running about nimbly on the beach, catching the sand fleas which were hopping on the surface. I have also seen them catching flies. I have a record of one I shot in 1884 whose stomach was stuffed with small specimens of the common mussel, *Mytilus edulis.*" Baker (1890, p. 268) states, as a result of stomach examinations made near Micco, that the principal article of food of this species is the mollusk, *Odostomia impressa.*

AVOCETS AND STILTS: FAMILY RECURVIROSTRIDAE

AMERICAN AVOCET: *Recurvirostra americana* Gmelin

RECOGNITION MARKS.—Larger than the Black-necked Stilt (length, 15 to 20 inches; spread, 27 to 38 inches; bill, 3 to 4 inches, *strongly upturned*); body plumage mainly white (pinkish cinnamon on neck); wings fuscous or fuscous-black, with *large white markings.*

RANGE.—Breeds in western North America, from eastern Washington, central Alberta, and Saskatchewan south to southern California, southern New Mexico, southern Texas, and Iowa (formerly in Illinois, Wisconsin, and New Jersey). Winters from central California and southern Texas to Guatemala. Casual east of the Mississippi River.

DISTRIBUTION IN FLORIDA.—Very rare and of casual occurrence. A record of one seen by N. B. Moore, at Manatee, November 3, 1872, is published by Baird, Brewer, and Ridgway (1884, vol. 1, p. 342). Moore's manuscript notes contain another record, a bird seen near Punta Rassa, April 15, 1877. The late Charles B. Cory, who had a wide experience on the east coast of Florida, wrote me in 1921 that he had seen a dozen at different times, and had killed two at Chester Shoals (probably some time between 1890 and 1900). H. L. Ferguson tells me that he killed two Avocets at Palm Beach Inlet in 1916.

HAUNTS AND HABITS.—Bent (1927b, p. 42) thus describes this bird's habits:

> Avocets are at all times tame and unsuspicious, very solicitous and aggressive on their breeding grounds, quiet and indifferent at other times, showing only mild curiosity. . . . The flight of the avocet is strong, direct and rather swift, much like that of the greater yellowlegs, with neck and legs fully extended, fore and aft. It can alight on or rise from the surface of the water with ease. On alighting its long, black and white wings are raised above its back, and slowly folded, as it settles with a nodding motion of the head, stands still and looks about it for a moment or two. . . . It often feeds while swimming by tipping up like a surface-feeding duck and reaching down into the water with its long neck and bill. It can even dive when necessary.

BLACK-NECKED STILT: *Himantopus mexicanus* (Müller)

OTHER NAMES: Longshanks; Lawyer Bird

RECOGNITION MARKS.—About the size of the Greater Yellow-legs (length 13 to 15.5 inches; spread, 26 to 30 inches; bill, 2 to 2.75 inches). Upperparts black, with a greenish cast; underparts white; bill black, slender, very slightly upturned; *legs very long, red or pink.* (Plate 37.)

RANGE.—Breeds from central Oregon, northern Utah, and southern Colorado south to southern California, southern New Mexico, southern Texas, coast of Louisiana, Florida, the Bahamas, West Indies, Mexico, and northern South America (formerly bred north to New Jersey). Winters from central California, southern Texas, and Louisiana south to Brazil and Peru.

DISTRIBUTION IN FLORIDA.—Locally common as a summer resident, chiefly in the central part of the State. It may winter in small numbers, but there are no definite records of it earlier than February 15, on which date in 1909 five birds were seen in the vicinity of Orlando by E. Stewart Hyer. The first were noted on Bird Island, Kissimmee River, February 19, 1910; at Titusville, March 11, 1905; Sanford, March 11, 1927; and on Upper Matecumbe Key, March 12, 1910. Stilts have been reported breeding at Anastasia Island, Lake Harney, Lake Jessup, Lake Tohopekaliga, Lake Kissimmee, Cape Canaveral, Salt Lake, Merritt Island, Lake Flirt, Punta Gorda, Sanibel Island, Lake Hicpochee, Biscayne Bay, Cape Sable, and on Lake Key in Florida Bay. Mrs.

Brodhead records a large flock on Upper Matecumbe Key, March 12, 1910, and another flock in Card Sound, March 24. Pennock considers the species of only casual occurrence at St. Marks, having seen a bunch of 5 birds there June 12, 1919. H. L. Stoddard observed one on Lake Jackson, April 7, 1928.

HAUNTS AND HABITS.—Stilts live mainly about the shores of lakes and ponds, feeding in shallow water on mud bars. They are gregarious, breeding in colonies and feeding in loose flocks. As they run or walk over the flats, they keep up a harsh chattering much of the time, somewhat like the cries of the smaller terns. They are rather suspicious, and when alarmed, set up a great outcry, which soon stirs up the other denizens of the marshes or mud flats.

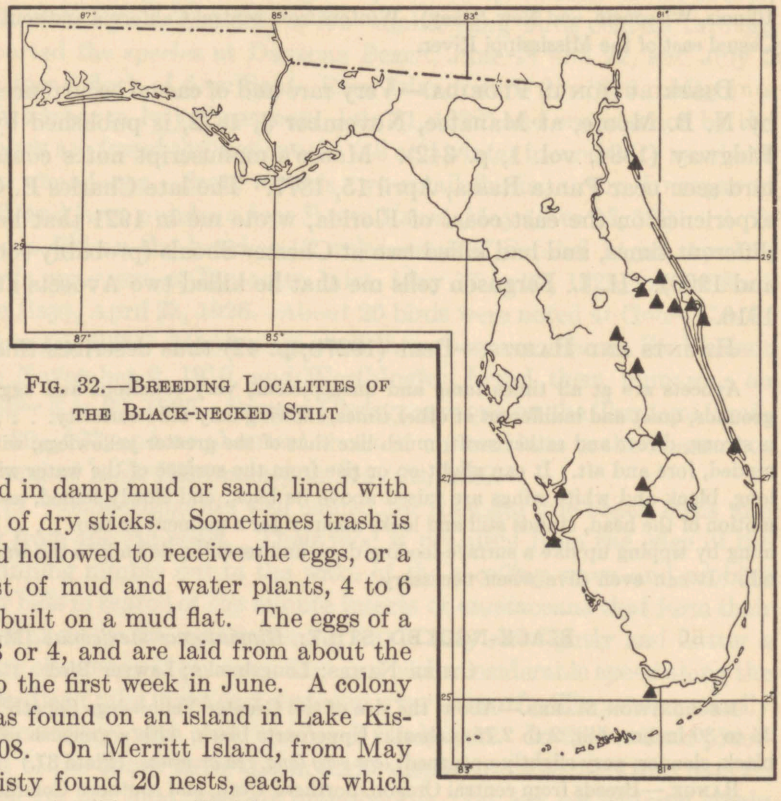


FIG. 32.—BREEDING LOCALITIES OF THE BLACK-NECKED STILT

Their nests are usually very simply constructed, often consisting of merely a depression scratched in damp mud or sand, lined with bits of shell or pieces of dry sticks. Sometimes trash is raked into a pile, and hollowed to receive the eggs, or a more substantial nest of mud and water plants, 4 to 6 inches high, may be built on a mud flat. The eggs of a set usually number 3 or 4, and are laid from about the third week in April to the first week in June. A colony of about 23 nests was found on an island in Lake Kissimmee, April 14, 1908. On Merritt Island, from May 16 to 24, 1929, Hardisty found 20 nests, each of which contained 4 eggs. Bent (1927b, pp. 47–48) reports two nests on Lake Key, near Cape Sable, May 8, 1903. Oscar Baynard found a nest with 4 eggs in an old phosphate mine near Plant City, May 10, 1931.

FOOD.—The food of the Stilt, as studied by Wetmore (1925, pp. 17–19), was found to consist almost wholly (98.9 per cent) of animal matter. Aquatic bugs were eaten in large quantities and amounted to 35 per cent of the total food. Beetles, including an abundance of weevils, composed 32 per cent of the food. Flies formed nearly 10 per cent, being entirely those kinds having larval forms of aquatic habitat. A few small fishes were identified in the stomachs and a considerable number of small snails, these last being especially prominent in a series of Stilts from Florida, taken in April. Other items found in small quantities were crawfishes, nymphs of dragon flies and May flies, and caddisfly cases.

PHALAROPES: Family Phalaropodidae

RED PHALAROPE: *Phalâropus fulicârius* (Linnaeus)

Other Names: Whale Bird; Sea Snipe

Recognition Marks.—Phalaropes are "swimming sandpipers," with *lobed toes*. The Red Phalarope may readily be distinguished from the other species by its rather *short, stout bill*. About the size of the Sanderling (length, 7.5 to 9 inches; spread, 14 to 16 inches; bill, .75 to .95 inch). *Winter plumage:* Head and underparts white; upperparts light neutral gray; *a broad white wing bar*.

Range.—Breeds in North America from northern Alaska and the Arctic islands south to Hudson Strait and southern Greenland; also in the Eastern Hemisphere. Migrates along both coasts of the United States and occasionally in the interior. Winters chiefly at sea, from the coasts of South Carolina and southern California south to southern South America.

Distribution in Florida.—There are but two definite records from Florida: A bird killed by striking the Canaveral Lighthouse (date not recorded) was sent to the Biological Survey by James M. Knight, keeper of the light, in February, 1889, and identified by Dr. C. Hart Merriam. A second specimen was taken by R. J. Longstreet at Daytona Beach, January 12, 1930. Cory (1896b, p. 270) says that he once purchased a stuffed specimen from a dealer in Jacksonville, but whether or not the bird was killed in Florida was not known.

Haunts and Habits.—Phalaropes are shore birds during their breeding season and in migration, but in autumn and winter they spend most of their time on the ocean, where they swim as buoyantly as a duck. They are very unsuspicious and usually allow one to approach them closely. In their mating habits they are unlike most other birds in that the male builds the nest, incubates the eggs, and takes principal care of the young.

WILSON'S PHALAROPE: *Stegânopus tricolor* Vieillot

Recognition Marks.—About the size of the Solitary Sandpiper (length, 8.25 to 10 inches; spread, 14.5 to 16 inches; bill, 1.25 to 1.5 inches; *very slender*). *Female in spring plumage:* Crown and stripe on back of neck pale smoke gray or white; a broad black stripe on each side of neck; back neutral gray, marked with auburn; under side of neck vinaceous-cinnamon. *Male in spring:* Upperparts mainly fuscous, *without auburn markings;* no black on neck. *Winter plumage* (sexes alike): Upperparts mouse gray or hair brown; underparts white.

Range.—Breeds from Washington, Alberta, Saskatchewan, and Manitoba south to central California, Utah, Colorado, Nebraska, Iowa, northern Illinois, and northern Indiana. Winters in South America, from Chile and central Argentina south to the Falkland Islands. Migrates chiefly through the interior of North America.

Distribution in Florida.—Occurs casually in migration, there being but two records. A specimen (No. 213480) in the Brewster collection in the Museum of Comparative Zoölogy is labeled "Anastasia Island, April 28, 1886," and is accredited to C. J. Maynard. The label is in Mr. Brewster's handwriting but there is no original label with the skin. Correspondence with Mr. Maynard brought the following reply, dated October 8, 1924:

> In regard to the specimen of Wilson Phalarope of which you write, will say that I have never collected any birds whatever on Anastasia Island, and have never shot a Wilson Phalarope anywhere. In view of the fact, however, that Mr. Brewster was always very careful about labels on his specimens, he

probably had some good reason for placing my name on the label of this skin and it may have passed through my hands, but I have no recollection of it.

The second record is furnished by H. L. Stoddard, who observed a Wilson Phalarope in a flock of sandpipers on Lake Jackson, September 12, 1926. Mr. Stoddard, who is familiar with all three of the phalaropes, feels certain of this identification, although the bird was not collected.

HAUNTS AND HABITS.—Wilson's Phalarope is similar in habits to the other phalaropes, but is less of a sea bird and more often found about fresh-water ponds. It feeds in shallow water, wading at times or swimming with ease, and in its search for food often spinning around on the surface like a top. Its manner of feeding is described by Roland C. Ross (in Bent, 1927b, p. 33), as follows:

. . . they feed with the head clear under and the energy of the feeding operation was indicated by the motion of the tail. They commonly walked steadily back and forth through the deeper sections of the ponds, and in such deep places they move as headless bodies, evidently feeding as usual in the surface mud. From the vigorous side moves of the tail it would seem they were feeding in their usual manner as well, that is, "side swiping".

Bent (1927b, p. 34) says of the bird: "In all its movements it is light, airy, and graceful. Its flight is much like that of the lesser yellowlegs, with which it is often associated; but when suddenly alarmed, it sometimes flies hurriedly away in a zigzag fashion."

FOOD.—Examination of 106 stomachs of this species in the Biological Survey (Wetmore, 1925, p. 9) showed its food to be largely of animal origin (93 per cent). Aquatic bugs formed nearly one-fourth of the total food, water boatmen being especially sought. Beetles of many species, including weevils, were found in the stomachs, and amounted to 20 per cent of the total food. Flies and their larvae composed 43 per cent of the food, of which mosquito larvae furnished 5 per cent. The vegetable food (6.7 per cent) consisted almost entirely of seeds of aquatic plants.

NORTHERN PHALAROPE: *Lóbipes lobâtus* (Linnaeus)

RECOGNITION MARKS.—Smaller than the Red Phalarope, with slender neck and *very slender bill* (length, 6.5 to 8 inches; spread, 13 to 14.5 inches; bill, .80 to 1.10 inches). *Winter plumage:* Upperparts fuscous-black or hair brown (dark drab) varied with white; head chiefly white, with a blackish stripe behind or beneath the eye; underparts white; wings fuscous-black, *with prominent white bar.* In spring, the male has cinnamon-buff markings on the back, and the female has a cinnamon-rufous collar on the throat.

RANGE.—Breeds in North America from northern Alaska and central Greenland south to the Aleutian Islands, northern Manitoba, northern Ontario, and northern Quebec; also in the Eastern Hemisphere. Its winter range is imperfectly known, but probably comprises the southern oceans. Occurs in migrations nearly throughout the United States, and in Mexico, Central America, Bermuda, and Hawaii.

DISTRIBUTION IN FLORIDA.—Known from two specimens, as follows: One discovered in a little pool in a pasture near Plant City, May 14, 1929, by W. Howard Ball, and collected by the writer; and one taken at Daytona Beach, August 23, 1929, by R. J. Longstreet. A bird was recorded in the Gulf of Mexico, 175 miles west of Tampa, March 14, 1918 (Helmuth, 1920, p. 258).

JAEGERS: Family Stercorariidae

POMARINE JAEGER: *Stercorârius pomarînus* (Temminck)

Other Name: Gull-chaser

Recognition Marks.—About the size of the Ring-billed Gull (length, 20 to 23 inches; spread, about 48 inches); elongated central tail feathers *wide, twisted. Light phase:* Top of head fuscous-black; nape white, tinged with yellow; back, wings, and tail fuscous; underparts white, more or less mottled on breast and throat with fuscous; ventral region brownish gray. *Dark phase:* Upperparts fuscous; underparts hair brown (dark drab).

Range.—Northern parts of the Northern Hemisphere in North America, Europe, and Siberia; in North America, it breeds on the Arctic coasts and islands from Alaska to Greenland. Winters off the Atlantic coast, in the Gulf of Mexico, and in the Southern Hemisphere (Peru, Australia, Burma, and South Africa). Migrates in fall along the coast of California.

Distribution in Florida.—This wide-ranging species is rarely seen in Florida, and has been taken but once—a specimen killed by W. R. Collins in 1914, two miles west of Palm Beach, and now in the mounted collection of the Florida State Museum (No. 14,228). Helmuth (1920, p. 261) reports 8 or 10 birds on April 9, 1918, following a vessel along the east coast of Florida and into the mouth of the St. Johns River. Earle R. Greene records two birds of this species seen late in December, 1928, about 30 miles south of Key West.

Haunts and Habits.—The Jaegers are the pirates among the birds, procuring much of their food by pursuing and robbing gulls, terns, and shearwaters. They are extremely agile and graceful on the wing. The Pomarine is the largest of the three species occurring on our coasts. It is sometimes difficult to distinguish it with certainty in life from the Parasitic Jaeger.

PARASITIC JAEGER: *Stercorârius parasîticus* (Linnaeus)

Recognition Marks.—About the size of the Laughing Gull (length, 15 to 21 inches; spread, 40 inches; folded wing, 11.80 to 13.50 inches); smaller than the Pomarine Jaeger; central tail feathers tapering and pointed, *not twisted*, projecting 3 to 4 inches beyond rest of tail; dark phase uniform fuscous; light phase similar to that of *pomarinus;* often shows a broad clouded band of drab gray across the breast.

Range.—Breeds in the Arctic portions of both hemispheres; in North America, from the coasts of Alaska and the Arctic islands south to the Alaska Peninsula, Great Slave Lake, Hudson Bay, and northern Labrador. It winters from Florida and southern California south along both coasts of South America to Argentina and Chile; also in the Eastern Hemisphere.

Distribution in Florida.—The Parasitic Jaeger occurs on the coasts of Florida irregularly in migration or in winter. Audubon (vol. 3, 1835, p. 470) states that he observed the species in flocks of 10 to 15, on the Florida Keys in April. A. C. Bent writes me that he took a specimen in the Bay of Florida, April 26, 1903. He records, also (1921, p. 20), a bird "off Jacksonville April 9." Helmuth (1920, p. 261) reports 5 birds on April 9, 1918, following a vessel along the east coast of Florida and into the mouth of the St. Johns River. A specimen was taken at Matanzas Inlet, May 18, 1894, by Wirt Robinson, and one was seen at Mosquito Inlet, April 11, 1910, by R. J. Longstreet. The

only records from the Gulf coast are sight records from Palma Sola, made by Miss Eleanor Earle, November 5, 1909, and December 11, 1911.[1]

HAUNTS AND HABITS.—The Parasitic Jaeger is so named from its habit of stealing its food from other species of birds. On its breeding grounds it preys also upon the eggs and young of various species. It is swift and strong in flight, pursuing terns or other birds with remarkable agility and causing them to drop any food they may have in their bills or throats. In their migrations these birds are found chiefly along the sea coasts.

LONG-TAILED JAEGER: *Stercorârius longicâudus* Vieillot

RECOGNITION MARKS.—Slightly smaller than *parasiticus*, and with much longer central tail feathers (10.50 to 14.50 inches); back slightly paler; abdomen and lower belly mouse gray (this color sometimes reaching to the middle of the belly); no dark band on breast, except in young birds, which have the entire head and breast dusky; apparently no dark phase.

RANGE.—Breeds on the Arctic coasts of both hemispheres; in North America, from northwestern Alaska, Ellesmere Land, and northern Greenland south to Hudson Bay and northern Labrador. In winter it has been seen at only a few points in the United States (South Carolina, Florida, and California). It has been reported in migration in interior North America (British Columbia and Manitoba to Missouri and Indiana); also in Chile and Argentina.

DISTRIBUTION IN FLORIDA.—This Arctic species ranges south in migration to both coasts of Florida. Wayne (1910, p. 2) mentions seeing numbers of the birds off the mouth of the St. Johns River in February; Longstreet (1910, p. 152) records one seen on Coronado Beach, April 11, 1910; and Helmuth (1920, p. 261) reports one or more seen between Alligator Shoals and St. Lucie Inlet, April 9, 1918. The late Charles B. Cory examined a specimen on the beach near Cape Canaveral about 1892 or 1893 (Ms. notes). Scott (1889a, p. 160) records a specimen of *S. parasiticus* taken at Marco in the winter of 1884, but reexamination by J. L. Peters of this specimen in the Museum of Comparative Zoölogy collection proves it to be referable to *S. longicaudus*. Miss Eleanor Earle reports an individual of this species seen at Passage Key, Tampa Bay, on numerous dates between June 14 and 30, 1910. Miss Phoebe Knappen noted one on Matecumbe Key, February 27, 1929.

HAUNTS AND HABITS.—The Long-tailed Jaeger is quite similar in its habits to the other Jaegers, but is said to be even more agile and graceful in flight. Nelson (1887, p. 48) says that the long, slender tail feathers and the extreme grace of these birds on the wing make them appear very much like the Swallow-tailed Kite.

FOOD.—This Jaeger has been reported preying upon mice, lemmings, small birds, moths, beetles, and insect larvae. It is very destructive to the eggs and young of various water birds and of ptarmigan. According to Bent (1921, p. 25), "They also pick up considerable offal of various kinds, as well as small crustaceans and worms. During the latter part of the season they feed largely on crowberries (*Empetrum nigrum*) and other berries."

[1] The bird recorded by Scott from Marco (Auk, vol. 6, p. 160, 1889) proves to be *S. longicaudus* (see above). H. H. Bailey states (1925a, p. 4) that A. H. Helme took specimens at Cedar Keys, but Mr. Helme writes me that this is an error.

PLATE 39

EXPLANATION OF PLATE 39

GULLS RISING FROM THE BEACH

The upper figures are adult (left) and immature Ring-billed Gulls; the middle figures are adult and immature Herring Gulls; the three lower figures are Laughing Gulls (immature, winter adult, and summer adult).

F.L. Jaques

GULLS AND TERNS: FAMILY LARIDAE

GLAUCOUS GULL: *Lârus hyperbŏreus* Gunnerus

OTHER NAME: Burgomaster

RECOGNITION MARKS.—About the size of the Great Black-backed Gull, larger than the Herring Gull (length, 26 to 32 inches; spread, 57 to 65 inches; bill, 2.15 to 3.00 inches). *Adult:* Body, wings, and tail mainly white, the mantle very pale silvery gray; primaries very pale gray, *appearing white in life. Immature:* Upperparts white, heavily mottled with light drab; underparts clouded with the same.

RANGE.—Breeds on the Arctic coasts from Alaska and Greenland south to James Bay, Labrador, and Newfoundland. Winters south to California, the Great Lakes, and Long Island, casually to Bermuda, North Carolina, Florida, and Texas.

DISTRIBUTION IN FLORIDA.—Known at present from a single record—a bird seen by Elon H. Eaton and James Savage on Coronado Beach, February 23, 1930. Their account of the observation (in letter) is as follows:

> The Glaucous Gull was feeding with Herring and Ring-billed Gulls on a dead porpoise and was noted to be larger than the Herring Gulls. The same shot that knocked over (but did not kill) the white gull killed the Herring Gull which stood beside it, so that we know that our standard as to its size was accurate. The bird was in the chalky white plumage of the second year.

While Mr. Eaton was shooting at the gull, Mr. Savage was operating a motion-picture machine, a positive record of the occurrence being thus obtained. This film has been viewed by the writer and by Dr. H. C. Oberholser, and we are agreed that the bird was correctly identified as a Glaucous Gull.

ICELAND GULL: *Lârus leucŏpterus* Vieillot

OTHER NAME: White-winged Gull

RECOGNITION MARKS.—About the size of the Ring-billed Gull (length, 20 to 24 inches; folded wing, 15.40 to 16.50 inches; bill, 1.65 to 1.90 inches). *Adult:* Entire body and tail white; mantle and wings pale gray. *Immature:* Body creamy white, mottled with drab-gray; primaries and tail drab-gray.

RANGE.—Breeds from Victoria Land, Boothia Peninsula, and west-central Greenland east probably to Nova Zembla. Winters from southern Greenland south to Long Island and the Great Lakes. Accidental in Maryland, Nebraska, off Cape Hatteras, and in the Gulf of Mexico.

DISTRIBUTION IN FLORIDA.—Known from only a single record—a specimen taken February 9, 1927, at Crystal River, by O. F. Swed, and now in the collection of the Florida State Museum (No. 30597).

HAUNTS AND HABITS.—This boreal species greatly resembles the Glaucous Gull in appearance but is smaller, with a relatively smaller bill. In habits, at least in winter, it is similar to the Herring Gull, with which it often associates. It feeds, like the other gulls, on small marine animals and on refuse found on the shore or on the surface of the water.

GREAT BLACK-BACKED GULL: *Lârus marînus* Linnaeus

OTHER NAMES: Saddleback; Turkey Gull; Coffin-bearer

RECOGNITION MARKS.—The largest of the Florida gulls (length, 28 to 31 inches; spread, about 65 inches). Adults are easily distinguished by their very dark (fuscous-black) mantle and wings; primaries and secondaries white-tipped; head, body, and tail white. *Immature:* Much like young of the Herring Gull, but larger, more whitish below and more brownish (less grayish) on back and wings.

RANGE.—Inhabits the coasts and islands of northeastern North America and northern Europe. In America, breeds from North Devon Island and western Greenland south to Newfoundland and Nova Scotia. Winters on the Atlantic coast from southern Greenland to Delaware Bay, and rarely to Florida; also occasionally on the Great Lakes.

DISTRIBUTION IN FLORIDA.—This northern Gull is known in Florida only as a rare straggler on the northeastern coast. Audubon records its occurrence at St. Augustine in 1831, and Cory (1896b, p. 59) states that one was shot there in the winter of 1894–95. Maynard (1881, p. 484) also mentions its occurrence in the State, but gives no details.

HAUNTS AND HABITS.—The Great Black-backed Gull is an extremely wary bird, most likely to be found on sand bars and beaches along the coast. It pursues smaller birds and robs them of their prey, kills and devours young birds and eggs, and even attacks birds the size of the Coot.

HERRING GULL: *Lārus argentātus smithsoniānus* Coues

OTHER NAMES: **Harbor Gull; Gray Gull; Winter Gull**

RECOGNITION MARKS.—The largest of the common gulls (length, 22 to 26 inches; spread, 54 to 58 inches; bill, 1.95 to 2.50 inches); *legs and feet flesh color. Adult in breeding plumage:* Bill yellow, with a large spot of red near the tip; body and tail white; mantle pale gray; primaries gray at base, fuscous or dark slate at tips, with large white spots. *Immature:* Entire upperparts and wings drab or hair brown (dark drab) mottled with creamy white; underparts hair brown or mouse gray; primaries grayish brown, without white spots; bill flesh color, blackish toward tip. (Plate 39.)

RANGE.—Breeds from the coast of Maine, southern Ontario, central Wisconsin, northern North Dakota, southern Alberta, and central British Columbia north to Yukon and south-central Alaska. In winter it ranges from the Great Lakes and the Gulf of St. Lawrence south to Cuba and Yucatan, and on the Pacific coast from Puget Sound to the Tres Marias Islands.

DISTRIBUTION IN FLORIDA.—Occurs nearly throughout the year, being absent only during the summer months. In winter and spring it is abundant along the coasts and in the harbors of the upper peninsula, where under protection it becomes very tame. Its migrations carry it to the Florida Keys and the West Indies, but it is less abundant there than in northern Florida. Small numbers have been recorded from Lake Okeechobee, but the bird is rarely found on the smaller lakes of the interior. Ludlow Griscom observed one on Lake Iamonia, January 2, 1912, and I noted an immature individual on Orange Lake, May 25, 1929.

Migrants from the North usually arrive in northern Florida about the middle of October (earliest at Pensacola, October 1, 1929). Earlier arrivals are recorded at St. Marks, September 27, 1917. At Pensacola, Weston reports the birds seen daily until April 26 (1925), when practically all disappeared. In 1926 the last was seen there on May 8. Bartsch observed some on the Tortugas, April 25 to 27, 1914, May 14 to 19, 1922, and August 19, 1925. Nonbreeding birds (chiefly immature) remain into the summer, having been noted at Mosquito Inlet, June 13 and 24 and August 30, 1923, and at Pensacola, June 17, 1922 (2 immature birds). J. W. Atkins, in 1888, reported the birds common in the harbor of Key West during winter and early spring. On the west coast they are said to be common in Tampa Bay, Charlotte Harbor, and at Sanibel Island. Several were seen at Miami Beach by Wetmore, March 3, 1919, and small numbers at Long Key and the surrounding waters, February 8, 1918, by the writer.

HAUNTS AND HABITS.—During the colder months of the year the Herring Gull is a familiar sight in the harbors and along the coasts of Florida. More than half of these wintering birds are in the dark immature plumage. In the vicinity of the docks in the harbors the birds are usually numerous, flying back and forth among the vessels at anchor or resting on piles, but ever alert to snatch up any bit of refuse that may be thrown into the water. Most of their food is procured from the surface, although they are said occasionally to plunge beneath the water for it in the manner of terns. These Gulls are common, also, on the beaches and mud flats, where they pick up food at the edge of the tide. Some of them have acquired the habit of carrying clams to a considerable height and dropping them on the hard sand beach, then flying down to eat the contents after the shell is broken. F. M. Weston says that they often pick up sea urchins and drop them from a height of about 50 feet on a hard beach.

In the harbors, where the Gulls are protected, they become very tame, but on the uninhabited beaches they are usually suspicious of man. Their flight is strong, steady, and graceful; when following a ship they frequently take advantage of ascending air currents and sail for long periods with motionless wings. They have a variety of loud alarm notes, and when excited by the presence of food, utter a series of squeals.

FOOD.—The Herring Gull is a scavenger and takes almost any form of animal food that comes within its reach. Examination of 61 stomachs in the Biological Survey showed more than one-half of the food to be fish, mainly in the form of carrion. Among the species recognized were perch, catfish, and carp. Other items of animal food found were mud puppies (*Necturus*), mice, mollusks, crustaceans, squids, marine worms, starfish, beetles and other insects, and a Horned Lark. The vegetable matter in the stomachs consisted almost entirely of marine algae. On Santa Rosa Island, April 17, 1926, we noticed a Herring Gull feeding on the carcass of a Loon that we had left on the beach.

RING-BILLED GULL: *Lârus delawarénsis* Ord

RECOGNITION MARKS.—Smaller than the Herring Gull; larger than the Laughing Gull (length, 18 to 20 inches; spread, about 48 inches); *legs and feet yellowish green;* bill in adults greenish yellow with a blackish ring or band near tip (in immature whole tip black); tail white in adult; immature birds have a broad band of fuscous on the tip of the tail, and the entire body is mottled with the same color, but they are not nearly so dark as young Herring Gulls. (Plate 39.)

RANGE.—Breeds mainly in southern Canada from Great Slave Lake and Hudson Bay south to northern New York, northern Wisconsin, North Dakota, Utah, and southern Oregon. Winters from British Columbia, Montana, Colorado, the Great Lakes, and Massachusetts south to Florida, Cuba, and southern Mexico.

DISTRIBUTION IN FLORIDA.—The Ring-billed Gull, though somewhat less numerous than the Herring Gull, occurs as a common winter resident, chiefly in the northern half of the State. Its arrival in autumn was noted at Pensacola, October 27, 1929, and November 4, 1928, and at Daytona Beach, October 29, 1927. The last seen in spring was on May 5 (1925) at Pensacola, and May 11 (1924) at Daytona. The birds were numerous at St. Marks, May 11 and 12, 1926. Later records in spring are given by Scott at Clearwater, May 21, and at Big Gasparilla Pass, May 22 (1886). Weston noted one at Pensacola, June 5, 1921, and Worthington recorded single birds at Fernandina, July 13 and August 3, and numbers on September 16 (1906). Bayard Christy saw one on Lake Okeechobee,

March 1, 1927. D. J. Nicholson observed one on a lake in the city of Orlando, December 8, 1930, and two on Lake Apopka, December 12, 1930. The species has been recorded from Miami, but apparently not from the Florida Keys, although it reaches Cuba and Mexico in its migrations.

HAUNTS AND HABITS.—This Gull is very similar in habits to the Herring Gull, with which species it commonly associates. It feeds, like the larger species, about the harbors and near the docks, as well as on the sea coast and on sand spits and mud bars. Most of its food is procured from the surface of the water, the bird poising gracefully with dangling legs or resting lightly on the water. The Ring-bills are strongly gregarious, often gathering in good-sized flocks of their own species, though mixing freely with other gulls and terns. At a distance, this species is not easily distinguished from the Herring Gull; when the two are together, however, the Ring-bill is seen to be noticeably smaller, and at close range the black ring on the bill is distinctive.

FOOD.—Examination of 41 stomachs of this species in the Biological Survey indicated its food to be about one-half fish, one-fifth insects, one-eighth refuse, and the remainder smaller proportions of mollusks, crustaceans, frogs, and mammals. Perch and carp were the fishes most often taken, and among the insects were weevils and other beetles, grasshoppers, crickets, locusts, cockroaches, and bugs.

LAUGHING GULL: *Larus atricilla* Linnaeus

OTHER NAME: Black-headed Gull

RECOGNITION MARKS.—Smaller than the Ring-billed Gull, larger than Bonaparte's Gull (length, 15 to 17 inches; folded wing, 12 to 13 inches; bill, 1.50 to 1.70 inches). *Adult in summer:* Head and throat dark mouse gray; tail white; outer primaries black; mantle neutral gray; bill dark brownish red shading to carmine; feet dusky red. *Adult in winter:* Crown and occiput mottled hair brown (dark drab); throat white; bill and feet dusky. *Immature:* Similar to winter adult, but tail broadly tipped with fuscous. (Plate 39.)

RANGE.—Breeds at various points along the Atlantic and Gulf coasts from Maine to Florida, Texas, the Lesser Antilles, and Venezuela. Winters from the Bahamas and South Carolina south to Chile and Brazil, but mainly in the Gulf of Mexico and the Caribbean Sea.

DISTRIBUTION IN FLORIDA.—Occurs throughout the year on all coastal waters, but breeds in only a few localities. Mrs. F. W. Sams, a long-time resident of New Smyrna, reported these Gulls nesting (about 1866) in large numbers on an island in the Halifax River near Port Orange. At that time their eggs were gathered in quantities for food. Scott (1888c, p. 374) recorded a few breeding at Charlotte Harbor, Punta Rassa, and Key West. In 1915, C. J. Pennock found about 15 pairs nesting on a small island about 10 miles west of St. Marks lighthouse; on June 6, the nests contained both eggs and newly hatched young. These birds formerly bred there in large numbers and were subject to much persecution by egg hunters. Bent and Job discovered a breeding colony on a key near Cape Sable (Dutcher, 1904, p. 129), and Nicholson reported a small colony in 1927 on a mangrove island near Tavernier. One of the largest nesting colonies in Florida was located on Passage Key, at the entrance to Tampa Bay. In 1912, Warden A. N. Pillsbury estimated that 1,200 birds nested and 1,000 young were raised. During the hurricane of October 22 to 26, 1921, this key was entirely washed away but the following spring it

began to build up again, and although it now comprises only about 3 acres, the Gulls in smaller numbers still use it for their nesting. In 1922, the birds nested on Panama Key and on bars near Pass-a-Grille, and in 1927 nests were found at Pass-a-Grille about the first of July. The species occurs commonly at Pensacola during most of the year, but does not breed nearer than the islands off the Louisiana coast. The birds are likewise found during much of the year on the Tortugas but do not breed there. Bayard Christy recorded them as abundant on Biscayne Bay in March, 1927. M. S. Crosby reported about 100 birds seen on Long Key, February 18, 1925, and 300 at Sanibel Island, December 26, 1925.

HAUNTS AND HABITS.—Laughing Gulls may be found at all seasons in the bays and harbors and about the islands and bars along the coast. Usually they occur in small straggling companies, but sometimes gather into rather large flocks. They feed to some extent on refuse picked up near the docks, but more often fish in the bays and inlets. When a school of small fishes is discovered, the Gulls hover over the water and pick up numbers of the fish without alighting. Bent (1921, p. 160) describes the habit of this Gull of stealing fish from the Brown Pelicans by alighting on their heads as they emerge from a plunge.

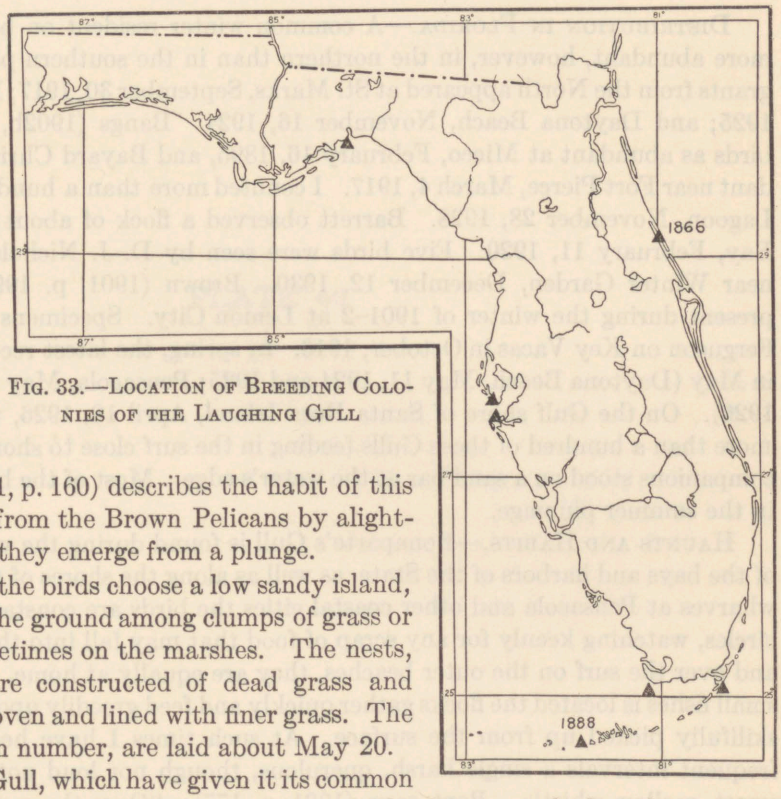


FIG. 33.—LOCATION OF BREEDING COLONIES OF THE LAUGHING GULL

For a nesting site the birds choose a low sandy island, placing the nests on the ground among clumps of grass or under bushes, or sometimes on the marshes. The nests, often quite bulky, are constructed of dead grass and sedges, firmly interwoven and lined with finer grass. The eggs, usually 3 or 4 in number, are laid about May 20.

The notes of this Gull, which have given it its common name, are described as *ha-ha-ha-ha-ha*, uttered in a high, clear tone, the last three or four syllables, especially the last, long drawn out (Langille).

FOOD.—Thirty-two stomachs of this species have been examined in the Biological Survey, the greater part of which came from the coast of Alabama. These Alabama birds, during summer, were feeding almost entirely on crustaceans and insects, while those from the Atlantic coast had taken fish. About 47 per cent of the total food was crustaceans (shrimps and crabs) and about 43 per cent fish. The insects taken included beetles, grasshoppers, ants, and moths.

BONAPARTE'S GULL: *Lârus philadélphia* (Ord)

OTHER NAME: Frost Gull

RECOGNITION MARKS.—The smallest of the Florida gulls; about the size of Forster's Tern (length, 12 to 14.5 inches; spread, about 32 inches; bill, 1.20 inches). Distinguished from any tern by the square tail and bill decurved at tip. Primaries largely white, with blackish or fuscous tips; in winter plumage head and neck mainly white, *with a spot of dark gray on side of head near the ear;* mantle and wings pale gray, the wings marked in the immature birds with fuscous; tail white in adults, brown-tipped in the young. (Plate 40.)

RANGE.—Breeds from the limit of trees in northwestern Alaska and Mackenzie (Anderson River) south to southeastern British Columbia and central Alberta. Winters from Massachusetts south to Yucatan, and on the Pacific coast from Washington south to central Mexico, and rarely to Peru.

DISTRIBUTION IN FLORIDA.—A common winter resident on both coasts of Florida, more abundant, however, in the northern than in the southern part of the State. Migrants from the North appeared at St. Marks, September 30, 1917; Pensacola, October 30, 1925; and Daytona Beach, November 16, 1924. Bangs (1902b, p. 395) recorded the birds as abundant at Micco, February 16, 1895, and Bayard Christy found them abundant near Fort Pierce, March 4, 1917. I counted more than a hundred birds in Mosquito Lagoon, November 28, 1928. Barrett observed a flock of about 1,500 in St. Andrews Bay, February 11, 1920. Five birds were seen by D. J. Nicholson on Lake Apopka, near Winter Garden, December 12, 1930. Brown (1901, p. 199) reports the species present during the winter of 1901–2 at Lemon City. Specimens were taken by H. L. Ferguson on Key Vacas in October, 1916. In spring, the latest records of occurrence are in May (Daytona Beach, May 11, 1924 and 1925; Pensacola, May 18, 1925, and May 21, 1926). On the Gulf shore of Santa Rosa Island, April 18, 1926, we watched a flock of more than a hundred of these Gulls feeding in the surf close to shore, while some of their companions stood on a sand bar at the water's edge. Most of the birds at this date were in the summer plumage.

HAUNTS AND HABITS.—Bonaparte's Gull is found during the winter months in most of the bays and harbors of the State, as well as along the shores of the Gulf. Around the wharves at Pensacola and other coastal cities the birds are constantly flying in graceful circles, watching keenly for any scrap of food that may fall into the water. In the bays and over the surf on the outer beaches, they are equally at home, and when a supply of small fishes is located the flocks gather quickly and feed greedily upon the fishes, which are skillfully picked up from the surface. At such times I have heard them uttering at frequent intervals a single harsh, querulous, though not loud note, and occasionally a sweet, mellow whistle. Bent says (1921, p. 177): "Over the marshy ponds of the interior flocks of these pretty birds are frequently seen beating back and forth, adroitly catching insects on the wing. . . ."

FOOD.—Examination in the Biological Survey of 78 stomachs of this species showed about one-third of the food contents to be insects, about one-half fishes, and the remainder small snails and crustaceans. Most of the fishes taken were small species inhabiting shallow water, and were of little or no economic value. The insects included water beetles, winged ants, and fly larvae.

PLATE 40

EXPLANATION OF PLATE 40

THE SMALLER TERNS AND BONAPARTE'S GULL

The two upper figures are Bonaparte's Gulls in winter (left) and summer plumages; below them are a pair of Least Terns in winter and summer plumages; the middle figures are Black Terns in summer (left) and winter plumages; below the Black Tern is a Common Tern in winter plumage, and at the lower left an adult in summer plumage; at the lower right is a pair of Forster's Terns in summer (upper) and winter plumages.

ATLANTIC KITTIWAKE: *Rissa tridactyla tridactyla* (Linnaeus)

OTHER NAMES: Snow Gull; Frost Bird

RECOGNITION MARKS.—About the size of the Laughing Gull (length, 16 to 18 inches; spread, about 36 inches); bill smaller (1.40 to 1.50 inches); legs and feet black. *Adult:* Bill greenish yellow; head white, with an ill-defined half-collar of deep neutral gray on sides of neck; tail white; primaries mainly pale gray, with the terminal portion abruptly blackish. *Immature:* Bill black; tail tipped with fuscous; primaries mainly fuscous (inner webs whitish); a broad band of fuscous on hind neck and another on upper wing.

RANGE.—The Kittiwake inhabits the northern parts of the Northern Hemisphere, breeding in North America from Prince Albert Land, North Somerset, and northern Greenland south to the Gulf of St. Lawrence. It winters from the Gulf of St. Lawrence south to New Jersey and casually to Florida and the Bermudas, and occasionally on the Great Lakes.

DISTRIBUTION IN FLORIDA.—Audubon recorded the Kittiwake, in a very indefinite way, from the Florida Keys. It seems probable that he was mistaken in his identification, for the bird is certainly no more than a straggler that far south. It remained for Major Allan Brooks (1922, p. 99) to establish its actual occurrence in Florida by shooting a specimen at Jupiter, January 24, 1921, which he presented to the Florida State Museum. A single bird was observed, March 4, 1927, by Bayard H. Christy and John B. Semple, on the shore of Indian River, near Fort Pierce. The bird was carefully studied at a distance of 40 yards, as it stood on the beach, and Mr. Semple, who had recently become very familiar with the Kittiwake in the North, was certain of the identification.

HAUNTS AND HABITS.—The name Kittiwake is given to this bird in imitation of its notes, which have been rendered as *keet keet wack wack* (Hoffman). It is a bird of the sea, at home there in any weather, and is rarely seen in the harbors or along the coasts. Kittiwakes often follow ocean steamers or coasting vessels for long distances, and feed on any refuse that may be thrown overboard.

GULL-BILLED TERN: *Gelochelidon nilotica aranea* (Wilson)

OTHER NAME: Marsh Tern

RECOGNITION MARKS.—About the size of Forster's Tern (length, 13 to 15 inches; spread, 33 to 37 inches); wings longer; tail shorter and less deeply forked (1.20 to 1.75 inches); bill black, *shorter and thicker than in most other terns.*

RANGE.—Breeds on the coasts of Virginia and Georgia, in the Bahamas and Cuba, and on the Gulf coast of Mississippi, Texas, and Mexico. Winters mainly in South America (Brazil, Argentina, Patagonia, and Chile), rarely north to the Gulf of Mexico (Texas, Louisiana, and Florida).

DISTRIBUTION IN FLORIDA.—Nuttall recorded the species (under the name *Sterna nuttallii*) from the Tortugas, but it has not been noted there by later observers. The first definite record from the State is that of a bird taken by A. F. Mears, December 17, 1886, at Johns Pass, Hillsborough County. The record has been published by Scott (1888c, p. 374) and the specimen is now in the Museum of Comparative Zoölogy. Earle R. Greene reports 7 birds seen at Pablo Beach, Duval County, July 11, 1925, and Charles E. Doe says that many were seen at Clearwater, the last week in May, 1927. Dr. C. W. Townsend saw one bird at Shell Point, Wakulla County, January 28, 1926.

HAUNTS AND HABITS.—The Gull-billed Tern, like most of its family, nests on sand flats among broken shells and pebbles. Its flight is strong and swift, the birds flying

usually at a considerable height. Their alarm notes are said to be loud and rasping, resembling the syllables *ka-did* or *killy-kadid*, accented on the last syllable.

FOOD.—The stomachs of five birds of this species taken in Alabama contained the remains of a small crustacean (*Emerita talpoida*), two large dragon flies, and a grasshopper.

FORSTER'S TERN: *Stĕrna fŏrsteri* Nuttall

RECOGNITION MARKS.—About the size of the Common Tern (length, 14 to 15 inches; spread, about 30 inches), and difficult to distinguish from that species, except in the hand; tail usually more deeply forked; primaries lighter on upper surface, but bill, in summer, dull orange, the terminal third black; in winter mainly blackish; crown and occiput black in summer, more or less whitish in winter, but in that plumage showing *a black patch in front of and behind the eye.* (Plate 40.)

RANGE.—Breeds in many localities in interior North America, from southern Oregon, southern Saskatchewan, central Alberta, and Manitoba south to Colorado, Nebraska, Minnesota, northeastern Illinois, and southern Ontario; and on the coasts of Texas, Louisiana, and Virginia. Winters from central California, South Carolina, and the Gulf of Mexico to southern Guatemala.

DISTRIBUTION IN FLORIDA.—Occurs as an irregular visitant during any season of the year, but does not breed in the State. Resembling the Common Tern so closely, it is with difficulty identified positively. Specimens have been taken on Amelia Island, September 12, 1906, December 22, 1905, and January 17, 1906; Talbot Island, Duval County, January 21, 1917; at Clearwater, February 4 and 10, 1880; Shell Point, near St. Marks, April 11, 1915 (75 or more seen); Cedar Keys, January 30, 1920; Tarpon Springs, September 12 to 28, 1886; Big Gasparilla Pass, May 22, 1886; Farmdale, Bay County, February 20, 1920; Orange Lake, May 25, 1929; Suwannee Sound, January 30, 1920; and Flamingo, April 6, 1926. The species is reported to occur commonly both in winter and in summer at Passage Key, Tampa Bay; Pillsbury records a flock of 1,500 birds seen there on May 31, 1906. We observed 15 individuals at Panama City, April 25, 1926, each sitting on a post near the city dock, and about 25 in similar situations near Apalachicola, May 8, 1926. Nicholson noted a single bird on a lake in the city of Orlando, January 19 and 25, 1931.

HAUNTS AND HABITS.—On its breeding grounds Forster's Tern is largely a bird of the marshes, making its nest on drifted piles of sedges or seaweed, or on old, dilapidated muskrat houses. The birds feed less upon fish than do the other terns, and at some seasons depend largely upon insects, which are secured on the wing. During their stay in the South their habits are similar to those of the other terns, and they are most frequently seen about the bays and harbors, where they often stay close to the city docks. Their notes are said to be distinctive—"a rasping, nasal, buzzing sound, suggesting the well-known note of the nighthawk. It also utters on rare occasions a soft 'wheat, wheat', like the common tern" (Bent, 1921, p. 235).

FOOD.—Sixty-three stomachs of this species were examined in the Biological Survey, 57 of which contained fish. The food fishes identified in these stomachs were 8 carp, 11 perch, 3 pompano, and 1 spot, all together comprising 18 per cent of the total food contents. Other fishes found were 3 sticklebacks, 17 silvery anchovies, 13 menhaden, 1 killifish, and 17 minnows. Three of the stomachs contained insect larvae and leaves of a pondweed, two were filled with grasshoppers, and one carried a large shrimp.

COMMON TERN: *Stérna hirúndo hirúndo* Linnaeus

OTHER NAMES: Wilson's Tern; Mackerel Gull; Sea-swallow

RECOGNITION MARKS.—Length, 13 to 16 inches; spread, 29 to 32 inches; bill of adult in breeding season bright vermilion, blackish terminally; in winter and in immature birds, more blackish; feet orange-vermilion in summer, more dusky in winter; primaries deep mouse gray on upper surface, bordered with white on inner vanes; outer tail feathers less elongated than in *forsteri;* the species can not always be distinguished with certainty from *forsteri* in the field. (Plate 40.)

RANGE.—The Common Tern is found in the breeding season chiefly in the northern parts of North America, from the coast of Mackenzie and Great Slave Lake south to Saskatchewan, North Dakota, northern Ohio, and North Carolina. A few birds breed in the Bahamas, on the Florida Keys, and on the coasts of Louisiana, Texas, and Venezuela; in winter most of them retire to the Southern Hemisphere, ranging on both coasts of South America as well as in Africa and Asia.

DISTRIBUTION IN FLORIDA.—Scott reported this Tern as an abundant migrant along the Gulf coast; he found it common at Big Gasparilla Pass, May 22; at Punta Rassa, July 18, 1886; and near Tarpon Springs, September 12 to 24, 1886, at which time about 60 specimens were collected. It is a regular winter visitant at St. Marks (Pennock, 1919, p. 111), and Mosquito Inlet (Longstreet); and it is said to occur throughout the summer at Passage Key. Weston found the species common on the Gulf beach near Pensacola, July 18, 1926. A specimen was taken on Jewfish Key, November 21, 1916 (Ferguson). Alexander Wetmore records one near Palma Sola, January 19, several at Cortez, January 26, and two near Punta Gorda, February 4, 1919. A specimen was found dead on Clearwater Island, near Dunedin, November 26, 1926, and another was picked up in an exhausted condition at Wabasso, November 23, 1926; both of these birds had been banded at Big Chicken Island, Ontario, July 24, 1926. A bird banded at Chatham, Massachusetts, July 13, 1926, was taken at St. Augustine, September 20, 1926.

Only one breeding colony of the Common Tern is known in Florida, that on Bush Key in the Tortugas.[1] This island was visited by Paul Bartsch, June 3, 1924, at which time there were eggs and newly hatched young in the nests. The colony was estimated to number about 75 pairs.

HAUNTS AND HABITS.—Although resembling Forster's Tern very closely in general appearance, the Common Tern differs considerably from that species in habits and notes. For a breeding ground these birds prefer a sandy or gravelly island nearly bare of vegetation. The nests are usually mere hollows scratched in the sand by the sitting birds, with the addition of a little beach grass or seaweed; sometimes, however, a rather elaborate nest is constructed. The eggs generally number 3 or 4, rarely 5 or 6. The birds feed almost entirely upon small fishes obtained by plunging into the sea for them. They are quick to discover a school of fishes near the surface, and their actions are a help to fishermen in locating a favorable place to cast their nets. The notes of these Terns are harsh and strident—a vigorous, rolling *tee-a-r-r-r.*

FOOD.—Examination in the Biological Survey of 185 stomachs of the Common Tern showed that a great majority of them contained fish. Nonedible species formed the bulk

[1] The record by H. W. Fowler (Auk, vol. 23, p. 396) of a breeding colony on Hailer's Rock is open to question, since Mr. Fowler informs me that he neglected to identify the birds specifically. They may have been either Common Terns or Roseate Terns.

of the stomach contents, those occurring in largest numbers being minnows, menhaden, and sand launces (*Ammodytes*). Other fishes found in smaller numbers were stone-rollers (*Campostoma*), anchovies, and sticklebacks (*Gasterosteus*). The only important food fishes found in these stomachs were 18 perch, 1 catfish, 1 chub mackerel, and 2 carp. Two birds had eaten only crickets, one having taken 41 of the insects. Five stomachs were filled with larvae of May flies, one with water beetles, 3 with crustaceans, 3 with ants, one with moths, and one with back-swimmers.

ROSEATE TERN: *Stérna doûgalli doûgalli* Montagu

RECOGNITION MARKS.—About the size of Forster's Tern or slightly smaller (length, 14 to 17 inches; spread, about 30 inches); *bill very slender, black*, reddish basally; legs and feet bright red; *outer tail feathers long and "streaming"*; upperparts and wings pale pearl gray (*much lighter than in Forster's or the Common Tern*); underparts satiny white, with a rosy tint.

RANGE.—The Roseate Tern is a very wide-ranging species, breeding both in the Eastern Hemisphere (Azores, Mediterranean Sea, etc.) and on the Atlantic coast of America from Sable Island, Nova Scotia, south to Virginia, in the Bahamas and Lesser Antilles, and on the coasts of Venezuela and British Honduras. Winters from the coast of Louisiana (rarely) and the Bahamas to Brazil and Chile.

DISTRIBUTION IN FLORIDA.—Audubon (1835, vol. 3, p. 296) found the Roseate Tern abundant on Indian Key in April, 1832, and discovered several small breeding colonies on "small detached rocky islands" among the Florida Keys, the exact locations not stated. At present, the species is apparently confined to the Tortugas, on which a colony of about 100 pairs was found in 1917 (Bartsch, 1919, p. 489) and has been observed in several succeeding seasons.

It occurs as a rare migrant on the Gulf coast, but apparently has never been recorded from the east coast of Florida. Single specimens were taken by Scott at Johns Pass, September 24, 1886, and by H. L. Ferguson at Sandy Key, in January, 1915. Griscom reports a flock of 11 seen at East Goose Creek, Wakulla County, March 28, 1919, and Crosby mentions a bird seen there, January 1, 1922. One was taken on Sombrero Key in March, 1887. Du Mont (1931, p. 248), records a single bird observed on Dunedin Isles, May 2, 1929.

HAUNTS AND HABITS.—The Roseate Tern resembles the other small terns closely in its nesting habits, breeding in colonies on sandy or rocky islands, often in company with the Common Tern. The eggs found by Audubon on the Florida Keys were deposited on the bare rocks, among the roots of grasses, and left in fair weather to the heat of the sun. Bartsch noted young birds on the rough coral and shell-strewn beach of Long Key in the Tortugas. In New England the nests are usually well concealed in tall beach grass or hidden among poison-ivy vines or under the shade of herbaceous plants (Bent, 1921, p. 257). The eggs usually number 2 or 3 to a set; the nesting season on the Florida Keys is in July.

This Tern, according to Bent, is "the greyhound of its tribe, the longest, slenderest, and most highly specialized of the terns." Its flight is light and graceful, and when feeding it often plunges beneath the surface for its prey. Its black bill, with red base, and the deeply forked tail with long streaming outer feathers serve to distinguish it from the Common Tern. Its voice is said to be entirely unlike that of any other tern—"a pro-

longed rasping cry like the syllables 'kreck' or 'crack' or 'kraak,' louder and on a lower key than the cries of other terns" (Bent, 1921, p. 263).

EASTERN SOOTY TERN: *Stérna fuscâta fuscâta* Linnaeus

OTHER NAME: Egg Bird

RECOGNITION MARKS.—Slightly larger than the Common Tern (length, about 16.5 inches; spread, 33 to 35 inches), with longer wings; tail deeply forked; *bill black*, stouter than that of the Common or Forster's Tern; crown black; *upperparts and wings fuscous-black; forehead white;* primaries from beneath dark mouse gray. (Plate 43.)

RANGE.—Breeds from the Bahamas, West Indies, and the Dry Tortugas south to Venezuela and British Honduras (formerly to Texas and Louisiana). Winters south to Brazil and the Falkland Islands. It has occurred casually, after storms at sea, as far north as New England and Lake Ontario.

DISTRIBUTION IN FLORIDA.—In Florida it breeds only on the Tortugas, where a colony estimated to number more than 20,000 birds has occupied Bird Key for many years. M. E. Spencer, lighthouse keeper at Sombrero Key, reported two single birds striking the light, between 10 and 11 p.m., June 10 and 12, 1887. C. J. Pennock has observed this species on several occasions on the coast of Wakulla County. From May 22 to 24, 1913, three or four pairs were seen about Shell Point, and on May 30, about 15 or 20 individuals; on April 10, 1917, five or six were noted in the bay near Goose Creek. D. J. Nicholson observed three at close range on Merritt Island, July 29, 1926. R. J. Longstreet picked up 4 dead birds at Daytona Beach on July 26, 1926, after a storm, and noted single birds there on September 18 and 19, 1926. On September 19 and 20, 1928, following the violent hurricane of September 16, thousands were seen in the city limits of Gainesville and several were picked up dead or exhausted. On this occasion, many of the birds tried to alight in trees.

HAUNTS AND HABITS.—The Sooty Terns arrive at their nesting grounds on the Tortugas usually about the middle of April, sometimes by March 20, and egg laying generally begins by May 10 and continues through June, or longer. The birds leave the island from about August 15 to September 20 to commence their winter wanderings. One specimen was collected there on February 15, 1923.

The nests are simply slight depressions scratched in the sand by the birds, and in some cases the eggs are laid on the bare sand without any nest formation (plates 42 and 43). Occasionally the sitting bird gathers a few bay cedar leaves from the ground and places them in a rim around the nest. The nests are located close together, each pair of birds occupying a space from 14 inches to 2 feet in diameter—just far enough from their neighbors to be free from interference while sitting. During the selection of the nest site many fights occur between the birds seeking to defend their chosen territory. Usually but one egg is laid by each female—rarely two. The parents take turns in incubating, the sitting bird being fed during the day by its mate. All the birds return to the island at night. They never alight on stakes or pilings as do other species of terns, but while away from the island pass the entire time on the wing. They often soar aloft in circles until lost to sight. Chapman says the Sooty Tern in flight looks much like the Common Tern; Bartsch remarks on its resemblance to the Black Skimmer, when flying low over the water.

Watson and Lashley (1915, p. 37) describe the bird's feeding habits as follows: "When large fish begin to prey upon the schools of minnows, the minnows, in their efforts to escape, spring out of the water; the birds, always hovering over the surface of the water, flock to these places and catch the minnows just as they leave the water." Very rarely has the bird been seen to dive for a fish. It never alights voluntarily on the water, and if compelled to alight, soon becomes water-soaked and helpless.

Watson (1915, pp. 46–58) conducted a series of experiments with these Terns that showed an astonishing ability on the part of the birds to return to their home site from long distances. Numbers of the birds were captured on their nests, marked with oil paints so they could be recognized, and carried to Havana, Cuba, Cape Hatteras, North Carolina, and Galveston, Texas, where they were liberated. The birds released in Cuba were on their nests on Bird Key the following day, and those released off Cape Hatteras found their way back to the Tortugas, a distance of approximately 850 miles in a straight line or more than a thousand miles by the shore line, in 5 days. Of the 12 birds carried on the Galveston trip, 6 were released in the middle of the Gulf of Mexico, 5 of which returned to Bird Key in from 4 to 7 days; 6 were released in Galveston Harbor, 2 of which reached their home station 6 and 7 days later.

Food.—Watson's observations on the Tortugas indicate that this Tern feeds almost exclusively on minnows. Ten stomachs from there examined in the Biological Survey contained 9 fishes and 1 squid.

BRIDLED TERN: *Stérna anaethétus melanóptera* Swainson

Recognition Marks.—About the size of Forster's Tern (length, 14 to 15 inches; folded wing, 10.5 inches); crown and lores black; *nape ashy white; back and upper surface of wings deep mouse gray* (often shaded with brownish); *forehead and stripe over the eye white.*

Range.—Western portion of the middle Atlantic Ocean and the Caribbean Sea, breeding from the Bahama Islands and the West Indies to the coasts of Venezuela and British Honduras. Accidental in South Carolina, Georgia, and Florida.

Distribution in Florida.—There are three records of accidental occurrence of this species in the State. The first is based on a specimen labeled "Florida," without definite locality or date, given by Audubon to George N. Lawrence and examined by Coues (1874b, p. 701). The second specimen was taken at Cape Canaveral, August 29, 1888, by Walter Hoxie, and is now in the British Museum. It is recorded by Saunders in the British Museum Catalogue (vol. 25, p. 106, 1896). Mrs. Kirk Monroe (1919, p. 435) records a bird blown ashore at Coconut Grove during a storm, but does not give the date.

Haunts and Habits.—The Bridled Tern closely resembles the Sooty Tern in appearance and apparently also in habits. It has been found breeding in the West Indies among broken coral-rock formations on beaches or cliffs.

LEAST TERN: *Stérna antillárum antillárum* (Lesson)

Other Names: Little Striker; Killing-peter

Recognition Marks.—The smallest of the terns (length, 8.5 to 9.5 inches; spread, about 20 inches); bill bright yellow in summer, usually tipped with black. Crown and lores black in summer, mainly white in winter, except on the nape and stripe to and around eye; *forehead white,* strongly contrasted with black crown; legs and feet bright orange-yellow in summer, duller in winter. (Plate 40.)

PLATE 41

EXPLANATION OF PLATE 41

THE LARGER TERNS AND THE BLACK SKIMMER

The five upper figures are adult and immature Black Skimmers; in the middle are a pair of Caspian Terns in winter (left) and summer plumages, and a pair of Cabot's Terns in summer and winter plumages; the two lower figures are Royal Terns in winter (left) and summer plumages.

PLATE 41

RANGE.—Occurs in the breeding season along the Atlantic and Gulf coasts from Massachusetts to Florida and Texas; also in the Bahamas, the West Indies, and on the coasts of Venezuela and British Honduras; in the interior it breeds on islands in the Mississippi and Missouri River systems north to South Dakota and Iowa, and west to western Kansas. Winters from the coast of Louisiana southward on the coasts of Central and South America to Argentina.

DISTRIBUTION IN FLORIDA.—Wintering chiefly in South America, this little Tern appears in northern Florida in the latter part of April (Santa Rosa Island, April 18, 1926; Mosquito Inlet, April 21, 1915; Daytona, April 26, 1925; Pensacola, April 28, 1925); and departs the latter part of September (Coronado, September 10, 1910; Daytona, September 14, 1924; Pensacola, September 12, 1926). It nests in scattered colonies in many localities along both coasts and occasionally in the interior (Lake Harney, June, 1915; Thonatosassa, June, 1887; Orlando, May, 1930). There are eggs of this species in the National Museum collection from Milton, St. George Island, Matanzas Inlet, Manatee, Indian Key, and the Tortugas. It is known to breed, also, on Hailers Rock (near Bahia Honda), Sand Key (near Key West), at Key Largo, Pensacola, St. Marks, Little Gasparilla Pass, Pass-a-Grille, Caxambas Pass, Titusville, and Mosquito Inlet. At the last-mentioned place, Pacetti estimated about 1,500 birds in 1916. On the Tortugas (Long and Bush Keys) about 500 birds were reported nesting in July, 1929.

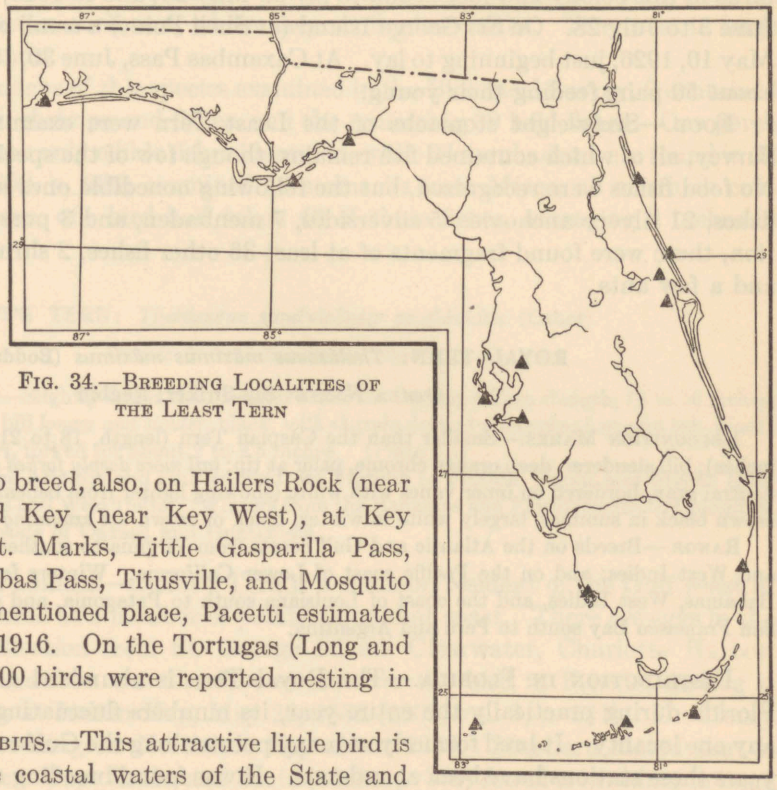


FIG. 34.—BREEDING LOCALITIES OF THE LEAST TERN

HAUNTS AND HABITS.—This attractive little bird is an inhabitant of the coastal waters of the State and may be seen in moderate numbers in the bays and lagoons and along the ocean beaches. Formerly one of the commonest and most widely distributed members of the tribe, it was almost exterminated during the period when its plumage was in demand for millinery decorations, but it is now slowly regaining its original abundance. In flight the Least Tern is swift and extremely graceful, pursuing its course at a height of 20 to 50 feet and frequently pausing to hover over the water in search of its prey or to make a swift and sudden plunge for some small fish it has discerned. The birds travel in loose companies, never in compact flocks like many other terns. Their notes are characteristic—"a shrill, rasping cry, sounding like the syllables '*zree ee eep*'" (Bent).

For a nesting site they select a sandy beach or mud bar, often on an island where they are safe from predatory animals. The nests are mere hollows scratched in the sand in the most open and barren situations, usually among scattered pieces of broken shells, or sometimes on a shell reef where there is no sand. On the sand bars the birds usually carry numerous pieces of broken shell to the nest, placing them in and around the hollow where the eggs are laid. The eggs number 2 or 3 in a clutch, and so strongly do they resemble the broken shells among which they are placed that they are difficult to discover. Nesting begins in Florida about the middle of May and continues through June and July. On a small shell reef near Pass-a-Grille, I found 11 nests containing eggs on May 15, 1918. At Mosquito Inlet, May 8, 1929, I noted a single egg; in 1924, the birds in this colony had just begun to lay on May 23; and in 1923, eggs were found from June 3 to July 28. On St. George Island (at Shell Point) a small colony was discovered, May 10, 1926, just beginning to lay. At Caxambas Pass, June 30, 1918, Pearson observed about 50 pairs feeding their young.

Food.—Sixty-eight stomachs of the Least Tern were examined in the Biological Survey, all of which contained fish remains, though few of the species could be identified. No food fishes were recognized, but the following nonedible ones were identified: 3 killifishes, 21 silvery anchovies, 5 silversides, 7 menhaden, and 3 pursy minnows. In addition, there were found fragments of at least 36 other fishes, 2 shrimps, 2 marine worms, and a few ants.

ROYAL TERN: *Thalâsseus maximus maximus* (Boddaert)

Other Names: Big Striker; Redbill

Recognition Marks.—Smaller than the Caspian Tern (length, 18 to 21 inches; spread, 42 to 44 inches); bill slenderer, deep orange chrome, paler at tip; *tail more deeply forked* (3 to 4 inches). Primaries neutral gray, bordered on inner vanes with white (showing lighter from beneath than in Caspian Tern); crown black in summer, largely white in winter; black of crown *not extending below eye.* (Plate 41.)

Range.—Breeds on the Atlantic and Gulf coasts from Virginia to southern Texas; in the Bahamas and West Indies; and on the Pacific coast of Lower California. Winters from northern Florida, the Bahamas, West Indies, and the coast of Louisiana south to Patagonia, and on the Pacific coast from San Francisco Bay south to Peru and Argentina.

Distribution in Florida.—The Royal Tern is abundant along all the coasts of Florida during practically the entire year, its numbers fluctuating greatly, however, at any one locality. It bred formerly at many points along the Gulf coast, but during recent years these stations have been abandoned. It was found breeding commonly on the Tortugas in May, 1832, by Audubon, and about 1858 by Bryant (1859a, p. 20), but at present it is not known to breed there, although a few resort to the islands during the spring and summer months (Bartsch, 1919, p. 490). Scott reported the bird breeding at Caseys Pass, May 28, 1886. There are eggs in the National Museum collection from St. George Island, Clearwater, Charlotte Harbor, and the Tortugas.

This Tern occurs more or less abundantly in northern Florida, in winter as well as in summer. Worthington recorded it as common on Amelia Island in January and February, 1906, and took two specimens there on August 28, 1906. Pacetti saw a flock, estimated to contain between 2,500 and 3,000 birds, at Mosquito Inlet, October 15, 1913;

Bangs (1902, p. 395) reported the species abundant near Micco, February 16, 1895; and Pillsbury noted about 3,000 birds at Passage Key, Tampa Bay, on May 31, 1906. We observed the bird in small numbers in Pensacola Bay, April 15; Santa Rosa Sound, April 17; on St. George Island, May 8; and in Deadman's Bay, May 24 (1926), but nowhere did we note any indications of breeding.

HAUNTS AND HABITS.—Royal Terns may be seen in any of the bays and inlets along the coast, and frequently over the surf on the ocean beaches. They fly at a considerable height with a steady and strong motion, occasionally giving a loud and rather harsh squawking *kak.* They travel usually in small companies, but at times, particularly in fall and winter, gather into large flocks. They fish over the ocean beyond the breakers or in the inlets when the tide is running. When their hunger is satisfied they retire to some secluded sand bar or shell reef, where they sit in close ranks. They nest in large colonies on sandy islands.

FOOD.—Of 45 stomachs of this species examined in the Biological Survey, 2 contained shrimps, 4 others both shrimps and fishes, and the remaining 39 held fishes. One perch and 2 bluefishes were the only edible fishes identified, while 34 menhaden were found in 23 stomachs. Baker (1890, p. 266) examined 15 stomachs from Micco, all of which contained *Squalius gibbosus;* one bird had taken 40 of these fishes, averaging 3 inches in length.

CABOT'S TERN: *Thalásseus sandvicénsis acuflávidus* (Cabot)

OTHER NAME: Sandwich Tern

RECOGNITION MARKS.—Slightly larger than Forster's and the Common Tern (length, 14 to 16 inches; spread, about 34 inches); bill *longer and stouter,* black, *with sharply defined yellow tip;* feet and legs black; tail shorter than in *forsteri,* forked for about 2 to 2.5 inches. (Plate 41.)

RANGE.—Breeds on the Atlantic and Gulf coasts from Virginia to Florida, Texas, and British Honduras; also in the Bahamas and West Indies. Winters from the Bahamas and Florida south to Colombia, Brazil, and the Pacific coasts of Oaxaca and Guatemala.

DISTRIBUTION IN FLORIDA.—Cabot's Tern is a common resident of the Gulf coast of Florida and formerly bred at a number of points along that coast. There are eggs in the National Museum collection from St. George Island, Clearwater, Charlotte Harbor, and the Tortugas. Audubon was the first to discover the bird in Florida, finding it breeding in abundance at Indian Key, May 26, 1832 (1835, vol. 3, p. 531). Dr. Henry Bryant reported it breeding on Northeast Key about 1858. Maynard stated that it bred on a small islet near Cape Sable, and Scott (1888c, p. 378) found it breeding in large numbers at Johns Pass, Pinellas County, in June, 1886. Three specimens were obtained by us May 17, 1918, in Boca Ciega Bay, from a bunch of four, but no indications of a breeding colony were seen anywhere along the west coast, from Sarasota to Homosassa. Fargo (1928a, p. 54) records a flock of 60 or more living around Mullet Key in Tampa Bay during March and April, 1927. In June of that year, H. P. Bennett made a search of the available nesting sites in that vicinity but failed to find any Cabot's Terns. H. L. Stoddard noted a single bird at Wakulla Beach, May 9, 1929.

These Terns winter as far north as Tampa Bay, 200 having been seen at Passage Key in January, 1906, and about 60 at Mullet Key on March 21, 1927. Scott collected 30

specimens near Tarpon Springs between September 12 and 22, 1886. Weston reports it of irregular occurrence at Pensacola. A flock of 8 was seen there May 16, 1926, and on August 15, 1926, the birds were common on the Gulf beach. There seems to be but one record from the east coast—that of 3 birds seen by Alexander Wetmore on the beach opposite Sebastian, February 14, 1919.

HAUNTS AND HABITS.—Cabot's Tern breeds on sandy islands along the sea coast in company with the Royal Tern. The eggs are laid in a slight hollow on the bare sand, each sitting bird locating just far enough from its neighbors to be out of reach of their bills. The usual number of eggs is two at the first nesting, which occurs in May or June, and one at subsequent nestings. This Tern is one of the swiftest and strongest fliers of its family. Its notes are described by Audubon as resembling the shrieking notes of the Carolina Paroquet. It feeds in the same manner as the other terns.

FOOD.—Eleven stomachs of this species were examined in the Biological Survey; one contained 3 shrimps, the others were filled with fishes. Three birds from Florida had eaten 5 menhaden, one had taken a silvery anchovy, and two had eaten 5 young fishes of the family *Carangidae* (Pompanos).

CASPIAN TERN: *Hydroprŏgne câspia imperâtor* (Coues)

OTHER NAMES: Imperial Tern; Redbill

RECOGNITION MARKS.—The largest of the terns; about the size of the Ring-billed Gull (length, 19 to 23 inches; spread, 50 to 55 inches); *bill very thick*, deep coral red; tail shorter and *less deeply forked* (about 1.50 inches) than in the Royal Tern; primaries deep mouse gray (appearing darker from beneath than in the Royal Tern); crown in summer black, in winter streaked with white; *black of crown extending below eye.* (Plate 41.)

RANGE.—Of nearly cosmopolitan distribution, breeding in North America in widely scattered localities from Great Slave Lake and southern Labrador to the South Atlantic and Gulf coasts. In winter it ranges from South Carolina and Florida to Texas and Mexico, and on the Pacific coast from San Francisco Bay to western Mexico.

DISTRIBUTION IN FLORIDA.—Occurs only as a rather uncommon migrant and winter resident. Specimens have been taken on Amelia Island, December 21, 1904; at Pass-a-Grille, January 26, 1925; and at Jewfish Creek, among the Keys, October 26, 1915. Boardman collected specimens from a large flock at Lake Jessup, March 13, 1876, and also shot some near Tampa Bay in May; no evidence of breeding was noted (1880, p. 64). The species has been observed at Fort Myers, Lake Hicpochee (February, 1926, C. W. Townsend), Pablo Beach (February), Daytona Beach (October 21, 1925; December 24, 1925; April 11 and 20, 1926), Palma Sola (December and January), Sebastian (February), Merritt Island (February), Cape Sable (April 10, 1927), Pensacola, and East Goose Creek (January 3, 1922). An individual that had been banded at Gravelly Island, Michigan, July 21, 1925, was found with a broken wing at Vero Beach, Florida, on November 21, 1926.

HAUNTS AND HABITS.—The Caspian Tern is the largest of the terns, and in size suggests a gull, although it flies and feeds in the manner of the smaller terns. It is found chiefly along the coasts and in the bays, singly or in small companies, mixing freely with the Royal Tern, which it much resembles. Its ordinary note is said to be quite unlike

Breeding Colony of Sooty Terns on Bird Key, Tortugas. (*Photo by Paul Bartsch*)

FIG. 1.—NODDY TERN ON NEST, BIRD KEY, TORTUGAS. (*Photo by Paul Bartsch*)

FIG. 2.—SOOTY AND NODDY TERNS IN THEIR BREEDING COLONY ON BIRD KEY, TORTUGAS. (*Photo by Paul Bartsch*)

that of the Royal Tern, being "a hoarse, croaking '*kraaa*' on a low key, loud, harsh, and grating" (Bent). It is said to soar in circles, high in the air, after the manner of gulls.

FOOD.—Thirteen stomachs of this Tern were examined in the Biological Survey, all of which contained fishes, some of considerable size. The species identified were mullet, perch, sunfish, suckers, and minnows.

BLACK TERN: *Chlidónias nígra surinaménsis* (Gmelin)

OTHER NAME: Sea-pigeon

RECOGNITION MARKS.—Larger than the Least Tern; smaller than the Common Tern (length, 9 to 10 inches; spread, 24 to 25 inches); bill black, slender; tail rather short, *not* deeply forked. *Breeding plumage: Head, neck, and underparts black;* back, wings, and tail neutral gray. *Winter plumage:* Head, neck, and underparts white. In changing plumage individuals are variously mottled with black and white; young birds have the upperparts marked with dull brown. (Plate 40.)

RANGE.—Breeds from central eastern Alaska and Great Slave Lake south to the Great Lakes, northern Missouri, Tennessee, Kansas, Colorado, Nevada, and southern California. Winters from the west coast of Mexico south to Dutch Guiana, Peru, and Chile.

DISTRIBUTION IN FLORIDA.—The Black Tern is abundant in many parts of Florida during migration; in fact, it begins the southward migration so early in the summer that the species may almost be classed as a summer resident, though it does not breed. It was recorded at Palma Sola on May 11, 1908, and May 10, 1912; Ponce Park, April 21, 1927; and St. Joseph Bay, April 6, 1886. Scott found it common at Johns Pass, near Tarpon Springs, June 3, 1886. Pennock noted a few at St. Marks on July 4, July 6, and August 4, 1915; Hoxie found them numerous at Titusville, August 16, 1888; Worthington took young birds on Amelia Island, September 11 to 17, 1906; Scott collected specimens at Tarpon Springs on August 3, September 15, and September 21, 1886; and Longstreet saw several at Coronado, October 18, 1910. They were present there, also, from July 12 to August 9, 1925. Weston reports them very abundant in summer and fall at Pensacola, appearing from the North early in July. During August, September, and sometimes well into October, the birds swarm over the Gulf and the larger land-locked waters in countless numbers. In 1919, and again in 1925, Black Terns were seen daily in small numbers up to November 24, and in 1920, up to November 7. On the afternoon of August 27, 1929, a flight of small flocks westward along the outer beach was estimated at more than 10,000 birds.

HAUNTS AND HABITS.—The Black Tern in its summer home in the North is an inhabitant of fresh-water marshes and sloughs; in the South it is found chiefly along the coasts, feeding in the bays and over the Gulf, and to a lesser extent on inland ponds. Its flight is buoyant and erratic, and much of its food is taken on the wing as it skims lightly over the surface of the water or stoops to pick up an insect from the tops of the marsh grasses. Its ordinary call note is "a short, sharp, shrill, metallic *krik*" (Bent). Over the sea it catches small fishes in the manner of the other terns. These Terns are strongly gregarious, gathering during migration into immense flocks, and often roosting on the beaches in close ranks.

FOOD.—On the sea coasts the Black Tern feeds mainly on small fishes, while on inland waters it subsists largely on insects. Of the total food contents of 270 stomachs ex-

amined in the Biological Survey, fishes formed 19 per cent. The species recognized were chiefly minnows and killifishes, and one yellow perch; in addition, there were some small fishes that could not be identified. Of the insect food, grasshoppers and locusts furnished the largest item, amounting to 19 per cent of the total food; nymphs of dragon flies were extensively eaten, furnishing 17 per cent; and beetles, flies, and ephemerids were taken in smaller quantities. A few crustaceans and three tadpoles were included in the material examined. This species is considered distinctly beneficial.

NODDY TERN: *Ánoüs stólidus stólidus* (Linnaeus)

RECOGNITION MARKS.—Slightly larger than the Common Tern (length, 16 inches; spread, 31 inches); bill black, long, and slender; tail *broad, fan-shaped, not forked;* forehead white, shading to pale smoke gray on the nape; rest of *body and wings fuscous.* (Plate 43.)

RANGE.—Breeds from the Bahamas and Florida Keys south through the West Indies and along the coasts of Mexico and Central America to Margarita Island, Venezuela, and on St. Helena, Ascension, and Tristan da Cunha Islands, South Atlantic Ocean.

DISTRIBUTION IN FLORIDA.—Its only breeding station in Florida is on Bird Key in the Tortugas, where a large colony has nested at least since the time of Audubon, and doubtless much longer. The birds arrive on the island about the middle of April, and the first eggs are laid about May 8; by the first week in September all have left for their winter wanderings over the ocean. In 1910, Dr. J. B. Watson, who was making an intensive study of the habits of the terns on the Tortugas, counted 855 nests of this species on Bird Key. For several successive years following this there was an increase in the size of the colony, and in 1916 T. J. Ashe estimated it to number 6,000 birds. Since then, storms have destroyed many of the bushes, and the colony has been somewhat reduced. In July, 1929, the warden estimated that 3,000 birds were present.

Apparently the Noddy does not wander northward after the breeding season to any extent as many other birds do. H. L. Ferguson says that occasionally an individual is seen at Key West, and Perry E. Wetmore reports a few seen in Tampa Bay in July, 1923. During the severe hurricane that struck southern Florida on September 18, 1926, R. J. Longstreet saw 5 Noddies at Daytona Beach, and on September 20 collected a specimen; these birds may have been blown in from the Bahamas.

HAUNTS AND HABITS.—The Noddies breed in a close colony, placing their nests on bay-cedar bushes, or on bunches of cactus, and laying usually but a single egg. The nests are constructed of dead branches from the cedar bushes or of seaweed, sometimes with the addition of sea shells and coral. They are often quite bulky, though loosely put together, and are utilized from year to year by adding fresh material. (Plate 43.) In feeding, the Noddies do not dive, as most terns do, but pick up their prey from the surface. Watson (1908b, p. 193) describes their feeding habits as follows:

> The birds fish by following schools of minnows which are being attacked by larger fish. The minnow, in its efforts to escape, jumps out of the water and skims the surface for a short distance. The terns pick off these minnows as they hop up above and over the surface of the water.

Most of their fishing is done in groups and within 9 or 10 knots of the island on which they are breeding. Audubon observed the Noddies catching fishes amid floating seaweeds, sometimes alighting in the water and swimming about among the seaweed.

PLATE 44

EXPLANATION OF PLATE 44

BIRDS OF THE FLORIDA KEYS

The Florida Keys afford resting places to thousands of migrating birds but few species make their homes on these comparatively barren islets. The characteristic species are shown in this group. From top to bottom, the birds are: a Florida Prairie Warbler, singing; a Black-whiskered Vireo; a Mangrove Cuckoo; a Yellow-billed Cuckoo; and a pair of White-crowned Pigeons (male and female). A wading Great White Heron is in the distance, and on the beach are two Wilson's Plovers and a Royal Tern.

F. J. HOUES

Watson's experiments showed that the Noddy, although rarely seen resting on the water, is a much better swimmer than the Sooty Tern, and is able to remain in the water for long periods without injury.

According to Job (1905, p. 94), the Noddy has no note other than a weak little croak. Concerning the flight of this species Chapman (1908, p. 196) says:

> As the only tern with a rounded, instead of a forked tail, the noddy might be expected to differ in flight from other members of its family. In fact, it suggested, when in the air, a light-bodied, long-winged, long-tailed pigeon. They fly rapidly, never hovering with the sooties, and they were often seen pursuing each other high in the air in what were doubtless mating flights.

Watson conducted a series of experiments to determine the homing instincts of these Terns, as already described under the Sooty Tern (p. 266). Six marked Noddies were released at various points between the Tortugas and Key West, and all of them returned to their nests the same or the following day; two birds released in Havana harbor, Cuba, also returned on the following day; while one of three Noddies released off Cape Hatteras, North Carolina, was seen several days later attempting to alight on its nest on Bird Key. In May, 1913, 12 Noddies were released at various points in the Gulf of Mexico, between Key West and Galveston; three of the four released at a point 585 miles from Key West returned to Bird Key in from 3 to 6 days; two birds released at a point 720 miles from Key West returned to the island in 11 and 17 days, respectively; and one of three released in Galveston harbor, 855 miles from Key West, returned in 12 days (Watson and Lashley, 1915, p. 57).

Audubon (1835, vol. 3, p. 264) was informed that this species was called Noddy because of its habit of alighting on the yards of vessels and sleeping there during the night. Watson, however, describes a nodding or bowing action as a part of the courtship ceremony, which seems more likely to be the origin of the name.

Food.—Watson states that the Noddy, like the Sooty Tern, lives almost exclusively on live minnows. Eight stomachs of the Noddy examined in the Biological Survey contained 96 silvery anchovies, 1 flying fish, and 7 unidentified fishes.

BLACK SKIMMER: *Rŷnchops nigra nigra* Linnaeus

Other Names: Shearwater; Scissorbill; Flood Gull

Recognition Marks.—About the size of the Royal Tern (length, 16 to 20 inches; spread, 42 to 50 inches); wings very long, with a broad white bar across secondaries; tail short, slightly forked, mainly white; *bill compressed* to knifelike thinness, *the under mandible longer than upper;* legs and feet orange-vermilion; upperparts fuscous-black; lower parts of forehead and lores white. (Plate 41.)

Range.—The Atlantic and Gulf coasts from New Jersey to Florida and Texas; wintering from northern Florida, southern Alabama, and Texas south to the coast of northern Brazil.

Distribution in Florida.—Although a permanent resident on the coasts of Florida, the Skimmer breeds in only a few localities. On the east coast, colonies are located on Amelia Island, on the coast of Duval County just north of the mouth of the St. Johns River, and on Coronado Beach at Mosquito Inlet. On the Gulf coast, the species nests at present only on Passage Key, on a few small islands in Tampa Bay, and on the coast near Pensacola. In 1922, a colony of about 500 pairs nested on Blind Pass Point, near Pass-a-Grille. The birds formerly nested in Charlotte Harbor, as attested by eggs in the

National Museum, collected by Würdemann about 1858. According to George Roberts of St. Marks, they formerly bred on Dog Island, near Carabelle.

In January, 1917, on Talbot Island, Francis Harper observed a flock of Skimmers estimated to number between 3,000 and 4,000 birds; and on Anastasia Island, in February, he saw about 1,000. Longstreet (1924, p. 33) records about 2,000 seen at Daytona Beach on December 25, 1923. M. S. Crosby reported about 400 Skimmers seen at Hobe Sound, February 15, 1924; 50 at Miami, February 20, 1924; and 200 at Tavernier, on the Upper Keys, February 17, 1926. Holt and Sutton (1926, p. 413) record four flocks of 25 each seen at Flamingo, January 18, 1924. Large numbers were noted by L. B. Hunt in Charlotte Harbor, January 14 and 18, 1924. At Cedar Keys, in January, 1920, I observed a flock of about 100; on Lake Hicpochee, April 19, 1919, a flock of 50 or more; and at Allenhurst, November 28, 1928, a flock of about 100. There is a single record from the Tortugas—a specimen taken about 1888 (Scott, 1890e, p. 306).

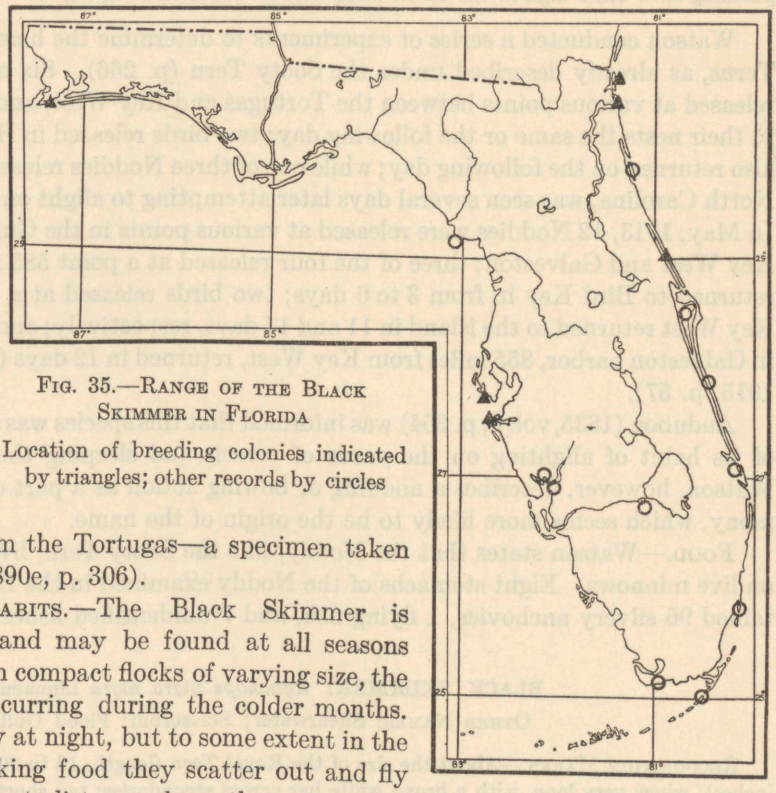


FIG. 35.—RANGE OF THE BLACK SKIMMER IN FLORIDA

Location of breeding colonies indicated by triangles; other records by circles

HAUNTS AND HABITS.—The Black Skimmer is strongly gregarious and may be found at all seasons along the sea coasts in compact flocks of varying size, the largest companies occurring during the colder months. The birds feed mostly at night, but to some extent in the daytime. When seeking food they scatter out and fly in straight lines a short distance above the water, close to shore, the long lower mandible cutting the surface of the water, and ready to pick up fish or other food that may come within its reach. The peculiar bill is evidently specialized for this particular method of feeding, but the Skimmer has been known to wade into shallow pools and pick up small fishes in the same manner as most other birds (Arthur, 1921, p. 571).

In flight, the Skimmers are extremely swift, agile, and graceful; the flock often mounts to a considerable height, twisting and turning in perfect unison, cutting circles in the air and finally alighting in close ranks on a sand bar, holding their long wings high over their backs for a few seconds until all have settled down, facing in the same direction, toward the wind. Their call notes, uttered in flight, are rather harsh and nasal, and have been compared to the barking or baying of a dog.

The birds nest on bare sand flats just above the high water mark, scooping out little hollows in the sand, in which the 4 or 5 eggs are laid. At Passage Key, laying was well under way on June 6, 1918, and Pillsbury reported eggs hatching as late as September 6 (1911). At Mosquito Inlet, in 1922, about 70 pairs were found nesting, the first eggs being noted on June 15, and all the nests containing eggs on June 25. In 1918, nesting had begun there by June 2 (Nicholson). In 1924, Longstreet found eggs in this colony from June 3 to July 28. At Pensacola, Weston and Stoddard noted 30 nests on June 24, 1928, about half of which contained four eggs each.

Food.—Skimmers apparently feed wholly on fish. Of 41 stomachs examined in the Biological Survey, 30 were empty; in the others were found killifishes and blennies—neither of them edible species.

AUKS, MURRES, AND PUFFINS: Family Alcidae

GREAT AUK: *Pláutus impénnis* (Linnaeus)

Range.—The Great Auk, now long extinct, formerly bred on the coasts and islands of the North Atlantic; the last pair of birds was taken in Iceland in 1844. In winter, the species probably ranged south along the Atlantic coast to southern New England and casually to South Carolina and Florida.

Distribution in Florida.—That this bird once occurred in Florida is evidenced by the finding of its bones in a shell heap at Ormond in 1902 (Hay, 1902, pp. 255–258).

DOVEKIE: *Álle álle* (Linnaeus)

Other Names: Little Auk; Ice Bird

Recognition Marks.—Our smallest eastern sea bird; about the size of the Mourning Dove (length, 7 to 9 inches; spread, 14 to 15.5 inches); bill very short and stout; upperparts black; underparts white, sometimes with a broad dusky band on breast; a narrow white wing bar (on secondaries).

Range.—The Dovekie breeds on the coasts and islands of the North Atlantic and Arctic Oceans, and winters along the coast from Greenland south to Long Island, and casually to South Carolina.

Distribution in Florida.—The occurrence in Florida of this northern species rests on the statement of C. J. Maynard that he saw one at close range in the Indian River, presumably in 1871 (Maynard, 1881, p. 499).

Haunts and Habits.—This hardy little bird is a dweller in the sea, where it is perfectly at home, even in times of storm. Forbush (1925, p. 47) says of the birds:

> Dovekies seem to be able to weather an ordinary gale, but now and then a protracted storm rising to hurricane force exhausts them and drives many ashore and even into the interior, where some alight in streams or in ponds if these are open. If the ponds are covered with ice the birds finally fall spent on the snow, ice, or frozen ground, from which it is believed they never rise again, since many have been picked up dead under such circumstances.

PIGEONS AND DOVES: Family Columbidae

WHITE-CROWNED PIGEON: *Colúmba leucocéphala* Linnaeus

Recognition Marks.—Larger than the Mourning Dove (length, 13 to 14 inches; spread, about 23 inches). General color bluish slate; top of head white in male, drab in female. (Plate 44.)

Range.—Southern Florida, the Bahamas, Greater Antilles, some of the Lesser Antilles, Yucatan, and the coast of Honduras.

DISTRIBUTION IN FLORIDA.—Occurs somewhat irregularly on a number of the Keys and on the southern end of the mainland, near Cape Sable. Bonaparte (1828b, p. 19) recorded it from Key Vacas and other keys, stating that the birds bred there in large colonies and that the young were much sought by the "wreckers." Audubon (1834, vol. 2, p. 444) found the birds breeding in abundance on a small key between the Tortugas and Key West, on which island he shot 36 specimens in less than two hours, and 17 more the following morning. Würdemann (1860, p. 427) noted them breeding abundantly in July, 1857, on a small key six miles northwest of Indian Key. He collected 18 specimens, and stated that nearly 200 birds had been killed in a single day by two hunters. Maynard (1881, p. 334) found them breeding on small keys near Key West the middle of June, 1871. Scott (1888b, p. 185) reports the birds common at Key West and gives a record of one taken at Punta Rassa, August 16, 1886—the first record from the mainland. H. L. Ferguson recorded the birds breeding in great numbers on the keys around Big Pine and Torch Keys. Fowler (1906, p. 398) observed the birds in June, 1904, on Boca Grande, Boca Chica, Sugarloaf, No Name, Bahia Honda, Vacas, Summerland, and Marquesas Keys. At the last locality, 25 birds were noted. Doubtless they breed on a number of these keys. Specimens were taken on the Tortugas, July 2, 1857, and May 18, 1922; one individual was seen there August 10, 15, and 22, 1925. In March, 1926, John B. Semple discovered a small flock living in the black mangrove forest about 12 miles north of Cape Sable, and on March 26 he shot a female with undeveloped ovaries near that point and presented it to the Biological Survey. Gilbert R. Rossignol reports seeing small numbers of these Pigeons in the same region on several occasions in January and February, 1929.

Audubon states that these Pigeons arrive on the Florida Keys from Cuba from the 20th of April to the first of May. While becalmed between Cuba and the Tortugas, June 4, 1826, he says: "During all this time flocks of Pigeons were crossing the Gulf between Cuba and the Floridas" (Audubon, 1835, vol. 3, p. 522). Ludwig Bethel, Warden of Key West Reservation, says that the birds arrive during the latter part of April, nest in May, and leave the last of July or the first of August. According to Maynard, they arrive about the first of June and depart late in October. Our records from near Cape Sable indicate that some of these birds winter on the mainland.

HAUNTS AND HABITS.—These Pigeons breed in colonies on the smaller mangrove keys. Audubon (1834, vol. 2, p. 445) describes their nesting habits as follows:

> The nest is placed high or low, according to circumstances; but there are never two on the same tree. I have found it on the top shoots of a cactus, only a few feet from the ground, on the upper branches of a mangrove, or quite low, almost touching the water, and hanging over it. In general the nest resembles that of the *Columba* [*Ectopistes*] *migratoria*, but it is more compact, and better lined. The outer part is composed of small dry twigs, the inner of fibrous roots and grasses. The eggs are two, opaque, white, rather roundish, and as large as those of the domestic Pigeon. . . .
>
> By the first of May the young squabs are nearly able to fly, and it is at this period that the greatest havoc is made among them. The fishermen and the wreckers visit the keys principally resorted to by this species, rifle all the nests they can find, and sometimes also shoot the young birds.

Under such persecution, it is no wonder the birds were described as "extremely shy and wary." The breeding season continues until midsummer, for on July 23, 1857, Würdemann found a number of nests with eggs nearly ready to hatch. He says the birds

were enticed within range by an imitation of their call—*kroo-ko-koo*, with the accent on the last syllable. Audubon says of their notes:

> During calm and clear mornings, when nature appears in all her purity and brightness, the cooing of this Pigeon may be heard at a considerable distance, mingling in full concord with the softer tones of the Zenaida Dove. The bird standing almost erect, full-plumed, and proud of his beauty, emits at first a loud *croohoo*, as a prelude, and then proceeds to repeat his *coo-coo-coo*. These sounds are continued during the period of incubation, and are at all times welcome to the ear of the visitor of these remarkable islands. When approached suddenly, it emits a hollow guttural sound, precisely resembling that of the Common Pigeon on such occasions.

FOOD.—Bonaparte (1828b, p. 19) says these Pigeons feed "on a kind of wild fruit, usually called beach plum, and some few berries of a species of palmetto . . . and especially on those of a tree called sweet-wood." Würdemann found the crops of the males he collected "full of a kind of red, oval berry, which grows on the larger and dry islands." Audubon mentions the sea grape as a favorite food of the bird. The stomach of a specimen taken near Cape Sable contained 19 seeds of Florida privet (*Adelia* sp.); 150 seeds of wild fig (*Ficus* sp.); and a few wasps and flies.

SCALED PIGEON: *Colúmba squamósa* Bonnaterre

RECOGNITION MARKS.—Larger than the domestic pigeon (length, 12.80 to 16.10 inches); tail feathers broad, square-tipped; plumage mainly slate color, the neck feathers purple, with dark margins, producing the effect of scales.

RANGE.—West Indies; accidental in Florida.

DISTRIBUTION IN FLORIDA.—Known from two records, both from Key West. A specimen was taken there by J. W. Atkins, October 24, 1896, and recorded under the name of *Columba corensis* (Atkins, 1899, p. 272). Chapman (1931, p. 116) records another specimen killed there May 6, 1929, the head of which was forwarded to the American Museum of Natural History for identification.

ZENAIDA DOVE: *Zenâida zenâida zenâida* (Bonaparte)

RECOGNITION MARKS.—About the size of the Mourning Dove (length, 10 inches; wing, 6 inches; tail, 4 inches); *tail rounded* (without lengthened middle feathers); neck and breast fawn color; belly russet-vinaceous; a glossy blue-black spot on side of neck.

RANGE.—Bahamas, Greater and Lesser Antilles, Florida Keys, and coast of Yucatan.

DISTRIBUTION IN FLORIDA.—Known only from Bonaparte's description and from Audubon's records of its breeding on the islands near Indian Key and occurrence on a small key between the Tortugas and Key West. Clifford H. Pangburn (1919, p. 400) records two birds seen at Pass-a-Grille, February 11, 1918, but its occurrence there seems unlikely and in the absence of a specimen, the record can not be considered to be established.

HAUNTS AND HABITS.—Audubon (1834, vol. 2, pp. 354–359) has given the best account of this bird's habits, as observed by him on the Florida Keys, from which account the following is quoted:

> The Zenaida Dove is a transient visitor of the Keys of East Florida. Some of the fishermen think that it may be met with there at all seasons, but my observations induce me to assert the contrary. It

appears in the islands near Indian Key about the fifteenth of April, continues to increase in numbers until the month of October, and then returns to the West India Islands, whence it originally came. They begin to lay their eggs about the first of May. The males reach the Keys, on which they breed, before the females, and are heard cooing as they ramble about in search of mates, more than a week before the latter make their appearance. In autumn, however, when they take their departure, males, females, and young set out in small parties together.

The flight of this bird resembles that of the little Ground Dove more than any other. It very seldom flies higher than the tops of the mangroves, or to any considerable distance at a time, after it has made choice of an island to breed on. Indeed, this species may be called a Ground Dove too; for, although it alights on trees with ease, and walks well on branches, it spends the greater portion of its time on the ground, walking and running in search of food with lightness and celerity, carrying its tail higher than even the Ground Dove, and invariably roosting there. The motions of its wings, although firm, produce none of the whistling sound, so distinctly heard in the flight of the Carolina Dove; nor does the male sail over the female while she is sitting on her eggs, as is the habit of that species. When crossing the sea, or going from one Key to another, they fly near the surface of the water; and, when unexpectedly startled from the ground, they remove to a short distance, and alight amongst the thickest grasses or in the heart of the low bushes. So gentle are they in general, that I have approached some so near that I could have touched them with my gun, while they stood intently gazing on me, as if I were an object not at all to be dreaded.

Those Keys which have their interior covered with grass and low shrubs, and are girt by a hedge of mangroves, or other trees of inferior height, are selected by them for breeding; and as there are but few of this description, their places of resort are well known, and are called Pigeon or "Dove Keys." It would be useless to search for them elsewhere. They are by no means so abundant as the White-headed Pigeons, which place their nest on any kind of tree, even on those whose roots are constantly submersed. Groups of such trees occur of considerable extent, and are called "Wet Keys."

The Zenaida Dove always places her nest on the ground, sometimes artlessly at the foot of a low bush, and so exposed that it is easily discovered by any one searching for it. Sometimes, however, it uses great discrimination, placing it between two or more tufts of grass, the tops of which it manages to bend over, so as completely to conceal it. The sand is slightly scooped out, and the nest is composed of slender dried blades of grass, matted in a circular form, and imbedded amid dry leaves and twigs. The fabric is more compact than the nest of any other pigeon with which I am acquainted, it being sufficiently solid to enable a person to carry the eggs or young in it with security. The eggs are two, pure white, and translucent.

Further exploration of the Florida Keys may result in the rediscovery of this species on some of the islands.

EASTERN MOURNING DOVE: *Zenaidúra macroúra carolinénsis* (Linnaeus)

OTHER NAMES: **Turtle Dove; Carolina Dove; Wood Dove**

RECOGNITION MARKS.—Smaller than the domestic pigeon (length, 11 to 13 inches; spread, 17 to 19 inches); middle tail feathers longer than the rest; tail when spread shows much white on ends of shorter feathers; general color above dark drab or olive-brown; breast cinnamon-drab, paler in the female. (Plate 31.)

RANGE.—Breeds from New Brunswick, Nova Scotia, and Ontario south to Florida and the Gulf coast. Winters from Iowa, southern Michigan, and Massachusetts south to the east coast of Mexico, Central America, and Panama.

DISTRIBUTION IN FLORIDA.—Breeds in suitable localities throughout the State; more numerous in winter because of the influx of migrants from the North. Würdemann records the species summering on Indian Key, and Scott reports it rare at Key West in

summer. It is common on Upper Matecumbe Key in winter. Maynard (1881, p. 344) says it is common on all the Keys at that season. We found a flock of 20 to 30 birds at Cape Sable late in March, and the specimens collected were in nonbreeding condition. In June, 1918, Mourning Doves were very rare in southern Florida, only one or two being noted in the pineland around Royal Palm Hammock and about the same number at Kendal and Fort Lauderdale. Farther north, from about Lake Okeechobee northward, they occur commonly in nearly all localities, in both winter and summer. They were common at Miakka Lake in June, 1918; along the canal bank west of Fellsmere, May 13, 1925; and on the Kissimmee Prairie late in April, 1923. Large numbers were seen June 6, 1925, flying along the borders of the wet prairie south of Gainesville. In June, 1926, they were abundant at McIntosh, Mayo, Greenville, and in Leon and Jefferson Counties.

Several breeding birds from Miami have been examined, and these do not differ appreciably from specimens from the Northern States.

HAUNTS AND HABITS.—The Mourning Dove occurs in a variety of situations, but is most likely to be found around cultivated lands, in pastures and stubble fields, and on the prairies. The birds range in flocks during the greater part of the year, and the flocks regularly visit fields containing gravel, which the birds consume in large quantities. They also make special trips in the afternoon to water holes or lakes to drink. At Ritta, on the south shore of Lake Okeechobee, early in March, large numbers were seen between 4 o'clock and sundown, flying to a particular spot on the lake shore. They appeared nervous, and remained but a short time before flying back into the custard-apple jungle to roost. They were reported to be foraging at that season on the saw-grass land —that portion of the Everglades that had been drained and partly cultivated.

By the middle of March, with the approach of the breeding season, the birds pair off and scatter out to nest. Apparently several broods are raised in a season, for Weston found nearly fledged young birds at Pensacola, April 10, 1921, and fresh eggs on July 1, 1923. At Tallahassee, on October 16, 1929, R. W. Williams found a nest with two young birds nearly ready to fly; these birds left the nest on October 19. The nests are very frail, being loosely constructed platforms of twigs, sometimes lined with a little dry grass, leaves, Spanish moss, or pine needles, and placed usually on a horizontal limb of a tree or bush anywhere from a few feet to 40 or more feet above the ground. Stoddard reports a nest *on the ground* in Leon County, April 22, 1927. The eggs are usually two in number.

FOOD.—The food habits of the Mourning Dove were studied by Beal (1904, p. 6), whose summary is as follows:

> The food of the dove consists of seeds of weeds, together with some grain. The examination of the contents of 237 stomachs shows that over 99 per cent of the food consists wholly of vegetable matter, less than 1 per cent being animal. Wheat, oats, rye, corn, barley, and buckwheat were found in 150 of the stomachs, and constituted 32 per cent of the total food. However, three-fourths of this amount was waste grain picked up after the harvesting was over. Of the various grains eaten, wheat is the favorite, and is almost the only one taken when in good condition. Most of it was eaten in the months of July and August. Corn, the second in amount, was all old, damaged grain, taken from the fields after the harvest or from roads or stock yards in summer. The principal and almost constant diet, however, is the seeds of weeds. These are eaten at all seasons of the year. They constitute 64 per cent of the annual food supply, and show very little variation during any month.

WESTERN MOURNING DOVE: *Zenaidúra macroúra marginélla* (Woodhouse)

RECOGNITION MARKS.—Closely similar to the eastern race, but averaging slightly paler, the upperparts slightly grayer, and size slightly larger.

RANGE.—Arid region of western North America from the eastern edge of the Great Plains to the Pacific coast (except the humid coast district of Oregon, Washington, and British Columbia), north to interior British Columbia and south to Central America.

DISTRIBUTION IN FLORIDA.—Known from only a single record—a specimen in the Cleveland (Ohio) Museum taken by Woods King at Wildwood, February 2, 1929 (Oberholser, 1930, p. 14).

PASSENGER PIGEON: *Ectopistes migratórius* (Linnaeus)

OTHER NAME: Wild Pigeon

RECOGNITION MARKS.—Much larger than the Mourning Dove (length, 15 to 18 inches; spread, 23 to 25 inches) with *much longer wings and tail;* underparts darker and more reddish (breast walnut brown); head deep mouse gray (without black spot).

RANGE.—Formerly bred from middle western Mackenzie, northern Manitoba, central Quebec, and Nova Scotia south to Kansas, Mississippi, Pennsylvania, and New York. Wintered from Arkansas and North Carolina south to central Texas, Louisiana, southern Alabama, and northern Florida; now extinct.

DISTRIBUTION IN FLORIDA.—Formerly a winter resident in northern sections, south at least to Alachua County. William Stork, writing in 1769 of northern Florida,[1] says: "The wild pigeons, for three months in the year, are in such plenty here that an account of them would seem incredible." From St. Marks, Pennock (1920a, p. 7) writes: "Within the memory of several of our older inhabitants these birds occurred in great numbers at regular intervals." Chapman (1888a, p. 270) reported them as rare winter visitants at Gainesville and mentioned two specimens in the possession of Roth Reynolds. Pearson (1893, p. 5) records a flock of 50 or more seen at Archer, presumably within recent years. Joseph Hamilton, a hunter of long experience, states that he saw three large flocks of Wild Pigeons, aggregating several thousand, flying over the marshes of the Econfena River in October, about 1907. He killed 4 birds out of the last flock. These were the only pigeons he had ever seen in Florida, although he was familiar with them in Arkansas.

HAUNTS AND HABITS.—The Passenger Pigeon, in former years, ranged in immense numbers over a large part of eastern North America, breeding in dense colonies in certain restricted areas in the forests of the Northern States and southern Canada. Their migrations were performed in enormous flocks, which at times darkened the sky. In winter they visited the Southern States, roving about in search of mast, which formed their principal food.

EASTERN WHITE-WINGED DOVE: *Melopelia asiática asiática* (Linnaeus)

RECOGNITION MARKS.—About the size of the Mourning Dove (length, 11.25 to 12.25 inches; spread, 19 to 20 inches); *tail rounded,* without elongated middle feathers, with *broad white patches* at the end; wings with a broad white bar, very conspicuous.

RANGE.—Breeds from southern Texas south through eastern Mexico to Costa Rica; also in the Bahamas, Cuba, Haiti, and Jamaica. Casual in Florida and Louisiana.

[1] He resided on the shore of Lake George.

DISTRIBUTION IN FLORIDA.—Of casual occurrence in winter in the central and southern parts of the State. Three specimens were taken at Key West by J. W. Atkins, as follows: November 14, 1888, and November 20 and 28, 1895. A specimen was taken in Osceola County, near Kissimmee, in November, 1896 (Ridgway, 1897a, p. 88), and one by E. Stewart Hyer, near Orlando, in the winter of 1908–9.

HAUNTS AND HABITS.—In habits the White-winged Dove is similar to the Mourning Dove, with which species it often associates. Bendire (1892, p. 146), from observations in Arizona, describes its notes as follows:

> Their call notes are varied, much more so than those of any other species of this family found with us; they are sonorous, pleasing, and rather musical. On this account the natives keep many of them as cage birds, calling them *Paloma cantador*, Singing Dove. They soon become very gentle and reconciled to captivity, feeding readily out of one's hand and allowing themselves to be handled without fear.
>
> One of their most characteristic call notes bears a close resemblance to the first efforts of a young Cockerel when attempting to crow, and this call is frequently uttered and in various keys. While thus engaged the performer usually throws his wings upward and forward above the head and also spreads his tail slightly. Some other notes may be translated into "cook for you," or "cook for two," "cook-kara-coo," besides a variety of calls, one of these a querulous harsh one, resembles somewhat the syllables "chaa-haa."

EASTERN GROUND DOVE: *Columbigallina passerina passerina* (Linnaeus)

OTHER NAMES: "Mourning Dove"; Tobacco Dove

RECOGNITION MARKS.—About the size of the Bluebird, but with heavier body (length, 6.5 to 7 inches; spread, 10 to 11 inches); under surface of wings auburn, *very conspicuous in flight. Male:* Underparts light vinaceous-drab, the breast with triangular fuscous spots; back and rump hair brown (dark drab); tail fuscous or fuscous-black, rounded. *Female:* Similar, but underparts mouse gray. (Plate 31.)

RANGE.—Lower Austral Zone of South Atlantic and Gulf States, from eastern Texas to North Carolina; accidental north to New York, Pennsylvania, and New Jersey.

DISTRIBUTION IN FLORIDA.—Resident throughout the State and on most of the Keys. Scott (1889a, p. 246) found it abundant at Key West; Fowler (1904, p. 453) recorded it on Boca Grande, Big Pine, Vacas, Summerland, and the Marquesas; and Bartsch noted it on Plantation, Long, Bahia Honda, and Newfound Harbor Keys. R. W. Williams (1904, p. 453) reported it formerly abundant in Leon County, but very rare in 1904. Weston finds it very rare in the Pensacola region, having noted it only three times in 10 years' residence. Throughout peninsular Florida it is generally distributed and common practically everywhere.

HAUNTS AND HABITS.—Ground Doves, frequently called "Mourning Doves" in the South, are fond of sandy fields, either cultivated or fallow, and are especially numerous on the sandy beaches and islands along the coast. They are very gentle and unsuspicious, often living in dooryards and gardens. Their flight is usually low and not greatly protracted. Their soft, plaintive notes—*coo-oo, coo-oo, coo-oo*—are often uttered for long periods during the day.

The nests of this Dove are placed in a variety of situations—on the ground, in a clump of vines or a bush, or on a horizontal branch of a tree, sometimes as high as 25 feet (Bendire). If on the ground, the nest is likely to be very frail, consisting often of merely a few grasses lining a shallow depression; or if in a tree or bush it is constructed of fine twigs, grasses, and rootlets. Occasionally a deserted nest of some other bird is chosen

for a base, to which are added a few dead grasses or weed stems. D. J. Nicholson reports that the birds frequently use the same nest consecutively for as many as four broods in a single season. The eggs are always two in number, and pure white. The breeding season extends from February to October; eggs have been taken at Orlando, February 27, 1922, March 18, 1922, June 3, 1917, July 6, 1913, and September 17, 1911; and at New Smyrna, September 23, 1925. At Daytona Beach, October 4, 1925, young just out of the nest were seen. Baynard (1909a, p. 5) says he has found eggs in every month of the year, and gives dates of February 5, 1907, October 28, 1907, and November 26, 1908. Rhoads (1895, p. 79) records eggs found at Tarpon Springs, October 19 to 22, 1893, and October 15, 1894.

Food.—Examination of 10 stomachs of the Ground Dove taken in Florida showed its food to consist almost wholly of seeds of various weeds and wild grasses, including crab grass (*Syntherisma sanguinale*), Egyptian grass (*Dactyloctenium aegyptium*), wire grass (*Eleusine indica*), foxtail (*Chaetochloa geniculata*), meadow grass (*Eragrostris* sp.), panic grass (*Panicum* sp.), amaranth, purslane, ragweed, spurge, mallow, sorghum, and sedge. One stomach contained more than 1,600 seeds of purslane, another more than 2,000 seeds of Egyptian grass, and one nearly 1,600 seeds of amaranth. Pine seeds to the number of 94 were found in one stomach.

KEY WEST QUAIL-DOVE: *Oreopeléia chrýsia* (Bonaparte)

Other Names: Key Pigeon; Key West Pigeon

Recognition Marks.—Slightly larger than the Mourning Dove, with *rounded tail;* upperparts deep reddish brown, glossed on hind neck and fore back with green and purple; underparts white, washed on breast with pale vinaceous.

Range.—Bahamas, Cuba, and Haiti; occasional on the Florida Keys.

Distribution in Florida.—Known only from the island of Key West. Audubon found the birds fairly common there in 1832, but since his time only a few have been observed. Maynard (1881, p. 342) made a special search for them there in 1870, but failed to find any. He was informed by an old resident that doves of several varieties were much more common in Audubon's time than at present, their disappearance being attributed to the cutting down of the timber. J. W. Atkins, who has lived and collected birds on the island for many years, has secured all told only three specimens of this Dove, one each on September 15, 1889, and October 20 and November 12, 1897 (Brewster, 1898, p. 185).

Haunts and Habits.—Audubon's account (1834, vol. 2, pp. 384–385) is our only source of information on this bird's habits. He says:

> The flight of this bird is low, swift, and protracted. I saw several afterwards when they were crossing from Cuba to Key West, the only place in which I found them. It flies in loose flocks of from five or six to a dozen, with flappings having an interval apparently of six feet, so very low over the sea, that one might imagine it on the eve of falling into the water every moment. It is fond of going out from the thickets early in the morning, for the purpose of cleansing itself in the shelly sand that surrounds the island; but the instant it perceives danger it flies off to the woods, throws itself into the thickest part of them, alights on the ground, and runs off with rapidity until it thinks itself secure. The jetting motions of its tail are much like those of the Carolina Dove, and it moves its neck to and fro, forward and backward, as pigeons are wont to do.

The cooing of this species is not so soft or prolonged as that of the Common Dove, or of the Zenaida Dove, and yet not so emphatical as that of any true Pigeon with which I am acquainted. It may be imitated by pronouncing the following syllables *whoe-whoe-oh-oh-oh.* When suddenly approached by man, it emits a guttural gasping-like sound, somewhat in the manner of the Common Tame Pigeon on such an occasion. They alight on the lower branches of shrubby trees, and delight in the neighborhood of shady ponds, but always inhabit, by preference, the darkest solitudes.

The nest of the Key West Pigeon is formed of light dry twigs, and much resembles in shape that of the Carolina Dove. Sometimes you find it situated on the ground, when less preparation is used. Some nests are placed on the large branches of trees quite low, while others are fixed on slender twigs. On the 20th of May, one of these nests was found containing two pure white eggs, about the size of those of the White-headed Pigeon, nearly round, and so transparent that I could see the yolk by holding them to the light. How long incubation continues, or if they raise more than one brood in a season, I am unable to say.

Towards the middle of July they become sufficiently abundant at Key West, to enable sportsmen to shoot as many as a score in a day; for, as soon as the young are able to follow their parents, they frequently resort to the roads to dust themselves, and are then easily approached. Dr. Strobel told me he had procured more than a dozen of these birds in the course of a morning, and assured me that they were excellent eating.

Their food consists of berries and seeds of different plants, and when the sea-grape is ripe, they feed greedily upon it. They all depart for Cuba, or the other West India Islands, about the middle of October.

RUDDY QUAIL-DOVE: *Oreopeléia montâna* (Linnaeus)

OTHER NAMES: **Mountain Partridge, Partridge Dove**

RECOGNITION MARKS.—About the size of the Mourning Dove, but with much shorter, nearly square tail. *Male:* Upperparts brick red; breast vinaceous-cinnamon; belly warm buff. *Female:* Upperparts olive-brown; breast snuff brown.

RANGE.—Tropical America, including West Indies; north in Mexico to Vera Cruz and Guerrero; accidental on the Florida Keys.

DISTRIBUTION IN FLORIDA.—Known only from two accidental occurrences on Key West—a specimen shot by a hunter, December 8, 1888 (Scott, 1889a, p. 160), and one taken alive by Ross C. Sawyer in May, 1923, and sent to the National Zoölogical Park in Washington in August of the same year, where it lived until March 5, 1926 (Hollister, 1925, p. 130).

HAUNTS AND HABITS.—Gosse (Birds of Jamaica, 1847, p. 321) says this species inhabits well-wooded country, especially where choked with bushes. He adds:

> It is essentially a ground-pigeon, walking in couples or singly, seeking for seeds or gravel on the earth. . . . Often when riding through the Cotta-wood, a dense and tangled coppice near Content, I have been startled by the loud whirring of one of these birds, and at the same instant its short, thick-set form has shot across on rapid wing, conspicuous for a moment from its bright rufous plumage, but instantly lost in the surrounding bushes. When on the ground it is wary and difficult of approach; but if it takes to a tree, it seems less fearful, and will allow the aim of the sportsman.

PARROTS AND PAROQUETS: FAMILY PSITTACIDAE

CAROLINA PAROQUET: *Conurópsis carolinénsis carolinénsis* (Linnaeus)

OTHER NAME: **Parakeet**

RECOGNITION MARKS.—About the size of the Mourning Dove (length, about 13 inches; spread, 21 to 23 inches); tail conical, feathers pointed (about 7 inches long); body, wings, and tail green; head and neck lemon yellow; forehead and sides of head orange or red. (Plate 1.)

RANGE.—Formerly, the Atlantic coast region of southeastern United States, from Florida north to Pennsylvania and New York, and west to Alabama (another race occupied the Mississippi Valley and ranged westward to Colorado); now believed to be extinct.

DISTRIBUTION IN FLORIDA.—Formerly resident nearly throughout the State; recorded from the Apalachicola River (Koch and McCrary, 1891, p. 183); Waukeenah (Wayne, 1895, p. 367); Matanzas River (Maynard, 1881, p. 249); Cedar Keys (specimen, December 17, 1870); Tampa (March 3, 1883); Blue Cypress Swamp, Indian River County (April 21, 1898, 2 specimens); Cape Florida (specimen, April 5, 1858); Miami (Salvadori, 1891, vol. 20, p. 205); London Island, Polk County (February 17 and 24, and March 24, 1897, J. Dwight collection); and Coconut Grove (common in 1885, Mrs. Kirk Monroe).

Scott (1889a, p. 249) states that the birds were very abundant at Panasoffkee Lake and on the Oklawaha River in the winter of 1875–76, and fairly common near Linden, Sumter County, in the winter of 1888–89. He took 4 specimens on Anclote Keys, March 8, 1880. Chapman (1890c, p. 4) collected 15 specimens and observed about 50 birds near the head of the Sebastian River in March, 1889. Cory (1895, p. 188) found the birds not uncommon in Broward County in the winter of 1894–95, collecting 6 specimens on the south branch of Middle River. E. J. Brown reported the birds plentiful in March, 1896, near Campbell, Osceola County. Dr. E. A. Mearns took 6 specimens on Padgett Creek, Brevard County, April 18, 1901. Apparently their last stronghold was in the vicinity of Taylor Creek, on the northeastern side of Okeechobee Lake. Here on February 29, 1896, Robert Ridgway collected 13 specimens, and in April, 1904, Frank M. Chapman saw two flocks aggregating 13 birds (1912, p. 318). W. W. Worthington hunted along both sides of Taylor Creek on March 26, 1907, without seeing any Paroquets. He learned from Frank Low, a resident there, that two birds had been killed from a bunch of five several months previously.

Capt. F. W. Sams, an old resident of Florida, told Dr. Amos W. Butler that he saw a flock of 8 or 10 Paroquets in 1909 at Cabbage Slough, on the west side of Turnbull Hammock, about 12 or 15 miles southwest of New Smyrna. E. Stewart Hyer, of Orlando, reports seeing one bird at Istokpoga Lake on February 16, 1910. A late and apparently authentic record is published by Chapman (Bird-Lore, 1915, p. 453) on the authority of W. J. F. McCormick, who claims to have seen about a dozen birds in March and April, 1915. The locality is not stated, but probably is Dade County. Henry Redding, who knows the birds well, reported a flock of about 30 seen on Fort Drum Creek in February, 1920. Doubt is cast on recent observations of this species unverified by specimens, particularly in southern Florida, because of the reported occurrence there in the wild state of a flock of *Aratinga holochlora*, a Mexican species quite similar in appearance to the Carolina Paroquet (Barbour, 1925, p. 132).

HAUNTS AND HABITS.—Carolina Paroquets in early times were found in the hammocks and swamps of Florida in flocks often numbering hundreds of birds. They visited, also, the prairies, cultivated fields, orange groves, and even the dooryards of the settlers to feed on mulberries. Bendire (1895, p. 2) has given a concise account of their flight and actions, based on personal observation, as follows:

> Although clumsy-looking birds on the ground, it is astonishing how readily they move about on the slenderest limbs in trees, frequently hanging head down, like Crossbills and Redpolls, nipping off the

seed bulbs of the sycamores, etc., and swinging themselves, with the assistance of their powerful beaks, from the extremity of one branch to another.

Their flight, which is more or less undulating, resembles both that of the Passenger Pigeon and again that of the Falcons; it is extremely swift and graceful, enabling them, even when flying in rather compact flocks, to dart in and out of the densest timber with perfect ease. Their call notes are shrill and disagreeable, a kind of grating, metallic shriek, and they are especially noisy while on the wing. Among the calls is one resembling the shrill cry of a goose, which is frequently uttered for minutes at a time. Formerly they moved about in good-sized and compact flocks, often numbering hundreds, while now it is a rare occurrence to see more than twenty together, more often small companies of from six to twelve. When at rest in the middle of the day on some favorite tree they sometimes utter low notes, as if talking to each other, but more often they remain entirely silent, and are then extremely difficult to discover as their plumage harmonizes and blends thoroughly with the surrounding foliage.

They are most active in the early morning and again in the evening, while the hotter parts of the day are spent in thick-foliaged and shady trees. They are partial to heavily timbered bottom lands bordering the larger streams and the extensive cypress swamps which are such a common feature of many of our Southern States. Social birds as they are, they are rarely seen alone, and if one is accidentally wounded, the others hover around the injured one until sometimes the whole flock is exterminated. This devotion to one another has cost them dearly, and many thousands have been destroyed in this way.

The Paroquets roosted at night in large hollow trees or stubs. Audubon (1831, vol. 1, p. 137) says:

> At dusk, a flock of Parakeets may be seen alighting against the trunk of a large Sycamore or any other tree, when a considerable excavation exists within it. Immediately below the entrance the birds all cling to the bark, and crawl into the hole to pass the night. When such a hole does not prove sufficient to hold the whole flock, those around the entrance hook themselves on by their claws, and the tip of the upper mandible, and look as if hanging by the bill.

Walter Hoxie tells me that in 1888 he knew of a large hollow cypress standing in Lake Okeechobee, some distance from the shore, which the Paroquets were accustomed to use regularly as a roosting place.

Strangely enough, no naturalist has ever been able to give a complete account of the nesting habits of this species. Audubon (1831, vol. 1, p. 139) states that their eggs are laid in the cavities in hollow trees where the birds roost, many females depositing their eggs together, but apparently he never personally examined a nest. Maynard (1881, p. 252) describes a nesting site found by one of his correspondents in a cypress swamp in Florida about the middle of June. A large number of the birds were seen about a huge, hollow cypress which they had been seen entering on a previous occasion, and the hole being opened, it was found to contain young. Bendire (1895, p. 4) mentions a set of two eggs said to have been taken April 26, 1855, from a hollow tree in Georgia. Amos W. Butler furnishes the following information on the nesting of the Paroquets, obtained from old residents of Florida: Alfred Grover found the birds nesting in a hollow cypress on the Tomoka River about 1892; he took their eggs and hatched them and had about 20 young birds. John Saul, of Enterprise, found their nests in a hollow tree; the parents were carrying food to the young. John Lewis Childs (1906, p. 65) has published an account of the finding of a set of 3 eggs by Dr. H. E. Pendry, April 2, 1896, near the head of the Caloosahatchee River. The nest was in a cavity of a sycamore tree, 40 feet up, "on the outskirts of the Great Swamp." Doctor Pendry was not sure of the identity of these eggs, as he saw no Paroquets at the nest, but they were in the swamp, and he had frequently taken

young birds in the same locality. The eggs were sent to Mr. Childs, who states: "there seems to be not the slightest doubt but that they are genuine." The account published by Brewster (1889b, p. 336) of this bird's nesting on horizontal limbs of cypress trees, although detailed and apparently authentic, is so widely at variance with the testimony of other observers and with the known habits of most parrots that we are obliged to believe it must be based on erroneous identification.

Robert Ridgway kept three Carolina Paroquets in captivity for several years, 1896–1903. They roosted in a nail keg provided for their use, clinging to supports that had been nailed on the inside, with the tail pressed against the side of the keg and the tip of the bill hooked over some projection as an additional support. The birds bred in two successive years, and one clutch of 5 eggs was hatched and the young reared to maturity.

The causes of this bird's extermination are well summarized by Maynard (1881, p. 253), as follows: ". . . in Florida, their enemies are legion; bird catchers trap them by hundreds for the northern market, sportsmen shoot them for food, planters kill them because they eat their fruit, and tourists slaughter them simply because they present a favorable mark." McCrary (1891, p. 183) tells of 200 birds having been killed by one man in 1889 in an orange grove in Hernando County.

Food.—Maynard (1881, p. 249) says that in central Florida the birds spent much time during the winter in cypress swamps, feeding on the cypress "balls." In February they visited the pine woods to obtain the seeds of the pine, and the borders of rivers to feed upon the seeds of maples and elms. He describes, also, his observation of a flock that visited a plantation on the Matanzas River to feed on "sand-spurs" (*Cenchrus* sp.). Chapman (1890, p. 5) writes of their habit of "skillfully dissecting the thistles they held in their feet, biting out the milky seed while the released fluffy down floated away beneath them." Their fondness for the seeds of cockleburs has been attested by numerous observers. According to Bendire, they fed on the seeds of sycamore and cypress, pecan and beech nuts, the fruit of the papaw (*Asimina*), mulberries, wild grapes, and other wild berries, and acquired a taste for oranges and bananas. W. J. Hoxie states (in letter) that they were very fond of the acorns of the low shrub oak that grows on the Kissimmee Prairie.

CUCKOOS and ANIS: Family Cuculidae

MAYNARD'S CUCKOO: *Cóccyzus mínor máynardi* Ridgway

Other Names: **Black-eared Cuckoo; Rain Bird**

Recognition Marks.—About the size of the Yellow-billed Cuckoo (length, 10.88 to 12.75 inches; tail, 6 to 7 inches); top of head and sides of neck light neutral gray; *a broad blackish brown stripe underneath and behind eye;* underparts white, *washed with pinkish buff and cinnamon-buff;* tail feathers with broad white patches at tips. (Plate 44.)

Range.—Bahama Islands, Cuba, Florida Keys, and southwest coast of Florida.

Distribution in Florida.—A summer resident in southern Florida, north to Anclote Keys. Specimens have been examined from Key West, Alligator Lake (near Cape Sable), Ten Thousand Islands, Cape Romano, Marco, Everglade, and Punta Rassa.

Scott (1888, p. 185) recorded the species from Tampa and Anclote Keys. Fowler (1906, p. 399) observed the birds in June on Key West, Boca Grande, Boca Chica, Sugar Loaf, Grassy Key, and Snipe Key. Bartsch reports one on Marquesas Keys, May 7, 1913, and Maynard describes his seeing one on Bamboo Key, in May, 1871. The birds apparently arrive in Florida in March, the earliest dates being March 15, 1919 (Everglade) and March 22, 1924 (Alligator Lake); the latest date on which the species was noted in autumn is September 19, 1887 (Key West).

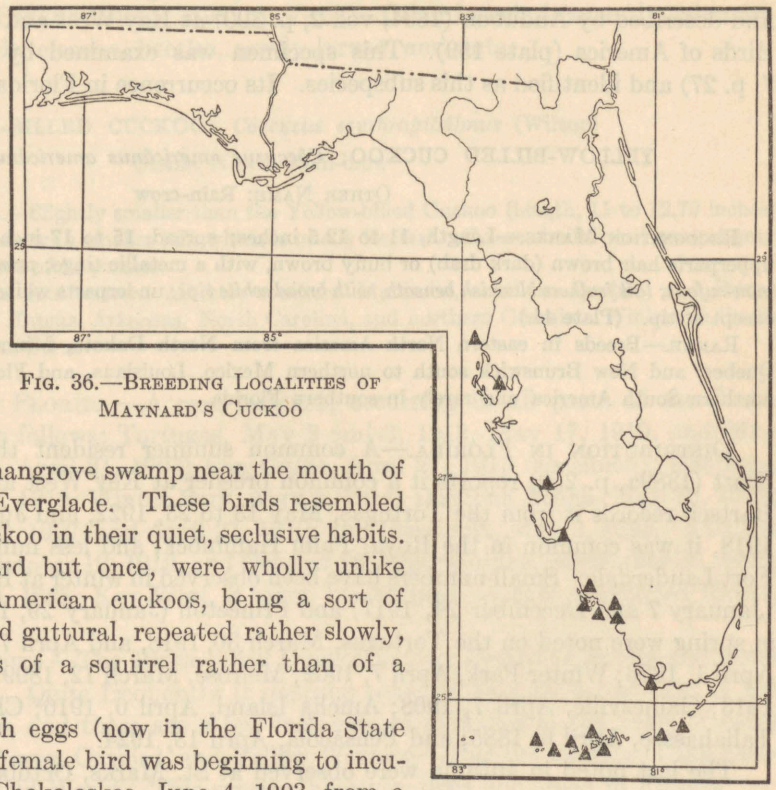


FIG. 36.—BREEDING LOCALITIES OF MAYNARD'S CUCKOO

HAUNTS AND HABITS.—The Mangrove Cuckoo (of which this form is a race) is well named, for all observers agree that it is found almost exclusively in mangrove forests. The only individuals I ever saw in life were two birds, a male and a female, collected in a black mangrove swamp near the mouth of Allens River, below Everglade. These birds resembled the Yellow-billed Cuckoo in their quiet, seclusive habits. Their call notes, heard but once, were wholly unlike those of the other American cuckoos, being a sort of clucking note, low and guttural, repeated rather slowly, suggesting the notes of a squirrel rather than of a bird.

A set of two fresh eggs (now in the Florida State Museum), which the female bird was beginning to incubate, was taken at Chokoloskee, June 4, 1903, from a nest 7 feet up in a red mangrove. Audubon (1834, vol. 2, p. 390) writes of the bird's nesting habits, as follows:

> The nest is slightly constructed of dry twigs, and is almost flat, nearly resembling that of the Yellow-billed Cuckoo. The eggs are of the same number and form as those of that species, but somewhat larger. It raises two broods in the season, and feeds its young on insects until they are able to go abroad.

FOOD.—The stomachs of two birds taken at Everglade, Florida, in March, were examined in the Biological Survey; the food in one consisted mainly of hairy caterpillars (Arctiidae), the stomach being well lined with caterpillar spines; the remains of 3 mantids (*Stagmomantis*) composed the remainder. The other stomach contained 4 long-horned grasshoppers, lepidopterous larvae, locustid eggs, mantids, and spiders.

JAMAICAN MANGROVE CUCKOO: *Cóccyzus minor nesiótes* (Cabanis)

RECOGNITION MARKS.—Similar to Maynard's Cuckoo, but more deeply colored below, the under parts of body much deeper buff, and the chest, fore neck, and throat distinctly buffy.

RANGE.—Resident in Jamaica, Haiti, Porto Rico, and other neighboring West Indian islands; accidental on Key West.

DISTRIBUTION IN FLORIDA.—Known from a single record—a specimen examined and described by Audubon (1834, vol. 2, p. 390) at Key West and figured by him in his Birds of America (plate 159). This specimen was examined by Ridgway (1916, vol. 7, p. 27) and identified as this subspecies. Its occurrence in Florida is purely accidental.

YELLOW-BILLED CUCKOO: *Cóccyzus americánus americánus* (Linnaeus)

OTHER NAME: Rain-crow

RECOGNITION MARKS.—Length, 11 to 12.5 inches; spread, 15 to 17 inches; tail, 5.5 to 6 inches; upperparts hair brown (dark drab) or buffy brown, with a metallic tinge; *primaries marked with cinnamon-rufous; tail feathers blackish beneath, with broad white tips;* underparts white; under mandible yellow, except at tip. (Plate 44.)

RANGE.—Breeds in eastern North America from North Dakota, Minnesota, southern Ontario, Quebec, and New Brunswick south to northern Mexico, Louisiana, and Florida. Winters mainly in northern South America and rarely in southern Florida.

DISTRIBUTION IN FLORIDA.—A common summer resident throughout the State. Scott (1889a, p. 250) reports it a common breeder at Key West and on the Gulf coast. Bartsch records it from the Tortugas, May 13 to 23, 1922, and June 9, 1921. In June, 1918, it was common in the Royal Palm Hammock, and less numerous at Miami and Fort Lauderdale. Small numbers have been observed in winter at Royal Palm Hammock (January 7 and December 24, 1917) and Princeton (January 29, 1917). First migrants in spring were noted on the Tortugas, March 30, 1918, and April 7, 1890; Punta Gorda, April 1, 1926; Winter Park, April 7, 1902; Melrose, March 12, 1899; De Land, March 30, 1913; Gainesville, April 7, 1908; Amelia Island, April 6, 1916; Chipley, April 8, 1903; Tallahassee, April 6, 1885; and Pensacola, April 13, 1924.

The last noted in autumn were observed at St. Marks, October 18, 1919; Daytona Beach, October 23, 1924; Pensacola, October 26, 1925, and November 2, 1919; and Orlando, November 17, 1929. Ten birds struck the light on Sombrero Key, October 9, 1885.

HAUNTS AND HABITS.—The Yellow-billed Cuckoo is a common inhabitant of heavy deciduous forests, river-bottom swamps, upland thickets, and hammocks. Along the marshy shores of the St. Johns River, near Lake Washington, I found the birds numerous on May 8, 1923. They are shy and secretive in their habits, remaining quietly concealed in thick shrubbery much of the time, but easily located by their characteristic notes, resembling the syllables *kow, kow,* repeated many times, at first slowly, gradually accelerated, and retarded at the finish. Their flight is straightforward, noiseless, and graceful.

The nests are very flimsy structures—mere shallow platforms of sticks or rootlets, with a few dry leaves or pieces of moss, placed in bushes or on the horizontal limbs of

trees, 8 to 12 feet above the ground. Nesting begins early in May (St. Marks, May 2, 1919; Seven Oaks, May 10, 1907) and may continue until August (Leon County, August 11, 1900). The eggs are commonly 3 or 4 in number, rarely 5 or 6.

FOOD.—The food habits of this Cuckoo place it in the class of highly beneficial species. The birds are mainly insectivorous and are particularly partial to caterpillars, including even many hairy and spiny species that most birds reject. Caterpillars composed nearly half of the total food in 155 stomachs examined in the Biological Survey, being found in 83 per cent of them (Beal and Judd, 1898, pp. 7–14.[1] Other insects frequently eaten are grasshoppers, katydids, cicadas, beetles, sawfly larvae, and ants.

BLACK-BILLED CUCKOO: *Cóccyzus erythropthálmus* (Wilson)

OTHER NAME: Rain-crow

RECOGNITION MARKS.—Slightly smaller than the Yellow-billed Cuckoo (length, 11 to 12.70 inches; spread, 15 to 16.75 inches), with smaller bill, which is *wholly blackish.* Colors similar; tail neutral gray beneath, *without prominent white patches.*

RANGE.—Breeds from southeastern Alberta, southern Manitoba, southern Quebec, and Prince Edward Island south to Kansas, Arkansas, North Carolina, and northern Georgia. Winters in South America from Colombia to Peru.

DISTRIBUTION IN FLORIDA.—A rare migrant, occurring in all parts of the State. Spring records are as follows: Tortugas, May 2 and 3, 1913, May 17, 1919, and May 14 to 22, 1922; Alva, April 21, 1907; Eau Gallie, April 27, 1910 (specimen); Hastings, April 13 and May 10, 1919; Winter Park, May 4, 1914; Daytona Beach, May 15, 1928; Amelia Island, May 2, 1907, and April 27, 1910; and Pensacola, May 2, 1925. Autumn records: Pensacola, October 19, 1919, and October 16, 1926; Quincy, September 30, 1900; Sunbeam, August 10, 1888; Key West, 3 taken by Atkins—no date mentioned (Scott, 1889a, p. 250).

HAUNTS AND HABITS.—The Black-billed Cuckoo is very similar in habits and notes to the Yellow-billed. Quite frequently it deposits some of its eggs in the nest of the Yellow-billed Cuckoo, and there are a few instances of it laying in the nests of other species—the Wood Pewee, Catbird, and Yellow Warbler—after the manner of the parasitic cuckoos of the Old World. This species, however, does not breed in Florida.

FOOD.—In its feeding habits, the Black-billed Cuckoo is very similar to the Yellow-billed. Beal states that the greatest difference is that the Yellow-billed eats more beetles and fewer bugs than the Black-billed does.

SMOOTH-BILLED ANI: *Crotóphaga áni* Linnaeus

OTHER NAMES: Black Parakeet; Black Witch; Savanna Blackbird; Tickbird

RECOGNITION MARKS.—About the size of the Florida Grackle (length, 13 to 15 inches; tail, 8 to 8.5 inches); bill compressed, *the upper mandible forming a thin, high crest;* tail feathers broad at tips; plumage uniform brownish black with purple or greenish reflections.

RANGE.—Eastern South America, Yucatan, and West Indies; rare or casual in Louisiana and southern Florida.

[1] Of these, 109 were of the Yellow-billed Cuckoo and 46 of the Black-billed.

DISTRIBUTION IN FLORIDA.—Occurs casually in southern Florida from Brevard County and Tampa Bay southward. The records are as follows: Pepper Hammock, near head of Banana River, one bird killed by Charles B. Cory in the late '90's; Brevard County, one shot by Thomas Barbour in the spring of 1901; Fort Pierce, one seen by W. J. Hoxie, between September 24 and 30, 1888; Lake Worth (in scrub), two specimens, male and female, taken December 21, 1897, by W. R. Collins (U. S. National Museum collection); New River, two killed by C. B. Cory (date not stated); Flamingo, one taken, June, 1916, by H. L. Ferguson; Key West, June, 1904, two seen by H. W. Fowler (1906, p. 399); Tortugas Keys, specimen taken, June 24, 1857, by G. Würdemann (U. S. National Museum collection); Buckingham, specimen taken about November, 1917, by Capt. J. F. Menge (collection of Ike Shaw, Fort Myers); Charlotte Harbor, specimen taken by G. A. Boardman (U. S. National Museum collection); and Long Key (near Pass-a-Grille), one taken, February 25, 1929, by W. G. Fargo (1929, p. 388). H. H. Bailey (1925a, p. 78) mentions two specimens taken by himself in Monroe and Dade Counties, and adds a record from Palm Beach County in August, 1923.

HAUNTS AND HABITS.—In Jamaica, according to Charles B. Taylor (Scott, 1892c, p. 369), the Ani is one of the commonest birds, frequenting in small flocks open or sparsely wooded lands or the vicinity of cultivated clearings. The birds are commonly found with herds of cattle, picking ticks from the backs of the animals or insects from the ground beneath. They are described as awkward in their movements, their flight slow and gliding, somewhat labored, and of short duration. Their call is said to suggest "the wailing of a young cat." They nest in colonies, many individuals working together in the construction of a large nest, in which all the females of the flock lay their eggs. Frequently 20 or more eggs are found in a single nest, deposited in layers, with dry leaves between each. The Ani is not known to breed in Florida, and little seems to be known of its habits there.

FOOD.—Concerning the food of this species in Jamaica, Taylor writes (quoted by Scott, 1892, p. 370):

> Insects of all orders and their larvae, ticks, grubs, etc., form their chief food. Occasionally, perhaps a few small lizards are taken, and, I believe, the eggs of other birds, as I once found in the stomach of a female portions of an egg, apparently that of some small bird. Gosse records having seen these birds eating the ripe berries of the fiddle wood, but I have not noticed them at any time eating vegetable food.

The stomach of the specimen taken by Fargo on Long Key contained one large grasshopper.

GROOVE-BILLED ANI: *Crotóphaga sulciróstris sulciróstris* Swainson

OTHER NAME: Jewbird

RECOGNITION MARKS.—Similar to the Smooth-billed Ani, but with three distinct grooves on upper mandible.

RANGE.—Breeds from the lower Rio Grande Valley, Texas, south to Peru. Casual in Arizona, Kansas, Louisiana, and Florida.

DISTRIBUTION IN FLORIDA.—Of accidental occurrence and very rare. A specimen taken at Jupiter Inlet early in January, 1891, is recorded by Packard (1891, p. 313).

PLATE 45

EXPLANATION OF PLATE 45

THE SMALLER WOODPECKERS

The upper figure at the left is an adult Red-headed Woodpecker and at its right is an immature bird of the same species; at the left center is a pair of Southern Downy Woodpeckers, male (upper) and female (lower); at the right center is a Red-bellied Woodpecker; the two lower figures are Southern Hairy Woodpeckers, male (left) and female (right).

F. L. JAQUES.

H. H. Bailey (1925a, p. 50) reports a specimen taken at Cape Sable, where it had been noticed for several days around a sugar mill.

BARN OWLS: Family Tytonidae

AMERICAN BARN OWL: *Tyto alba pratincola* (Bonaparte)

Other Names: **Monkey-faced Owl; White Owl**

Recognition Marks.—About the size of the Red-shouldered Hawk (length, 15 to 21 inches; spread, 43 to 47 inches); legs and wings very long. Face white, with a rim of cinnamon-buff feathers forming an elongated facial disk; upperparts and wings ochraceous-buff or cinnamon-buff, mottled with neutral gray; underparts cinnamon-buff or white, sparingly spotted with hair brown (dark drab); lining of wings chiefly white, the primaries with fuscous spots.

Range.—Resident from northern California, Colorado, Nebraska, Illinois, southern Wisconsin, New York, and Connecticut south to southern Mexico (casually to Oregon, Minnesota, Michigan, Ontario, Vermont, and Massachusetts).

Distribution in Florida.—A rather common permanent resident in all parts of the State. Audubon (1834, vol. 2, p. 403) describes finding this bird breeding in the old fort at St. Augustine on November 8, 1832, and Maynard (1881, p. 255) mentions finding the birds inhabiting the same building in 1869. The species has been reported from Pensacola, St. Vincent Island, Tallahassee, Goose Creek, Gainesville, Tarpon Springs, Fernandina, Waukeenah, Kissimmee, Canaveral, Ritta, Citrus Center, Siesta Key (near Sarasota), St. Petersburg, Royal Palm Hammock, Cape Sable, and Key West. It is doubtless more common than reports indicate, since by reason of its nocturnal habits it is not often seen.

Haunts and Habits.—The Barn Owl is mainly nocturnal and is scarcely ever seen abroad before dusk. During the day the birds remain hidden in hollow trees or in the loft of some building; in these situations they lay their eggs and bring up their young. The breeding season covers a large part of the year and young birds have been found in the nest in October and November, as well as throughout the winter and spring. At Istokpoga Lake, March 24, 1923, we found two young Barn Owls, about a month old, in a hollow live oak. At Fort Kissimmee, on March 27, we collected a set of 4 eggs from a dead oak stub, and on April 27, found the bird sitting on 6 more eggs in the same hollow. A pair of Barn Owls occupied a chamber of the old fort at St. Augustine in 1907, laying their eggs in August.

Barn Owls often live in towns or cities, but they seek their prey mainly in the open country, about farm lands and hammocks and over prairies and marshes. Their flight is swift and noiseless as they search the ground for their favorite food of small rodents. At such times, according to Bendire, the birds give vent to a "peevish scream." Like all the owls and hawks, this species disgorges the indigestible portion of its food in the form of pellets, and considerable quantities of such castings are usually found in or near their nests.

Food.—The Barn Owl is one of the most useful birds of its tribe, and its presence about the farm or town should always be encouraged. Its favorite food consists of rats, mice, shrews, pocket gophers, and other small mammals, and these are consumed in large

numbers. In the South, its destruction of cotton rats, as well as of the common brown rats, specially commends the bird to the farmer. Small birds are very rarely captured, and chickens are apparently never molested. Insects, particularly locusts and grasshoppers, are eaten to some extent, and in other countries bats form a considerable part of the food (Fisher, 1893, p. 136). A bird taken at Bassenger had eaten a rice rat (*Oryzomys palustris*).

TYPICAL OWLS: Family Strigidae

FLORIDA SCREECH OWL: *Ótus ásio floridánus* (Ridgway)

Other Names: **Squinch Owl; Death Owl; Cat Owl; Shivering Owl; Mottled Owl**

Recognition Marks.—The smallest of the Florida owls (length, about 8.5 inches; wing, 5.60 to 6.40 inches); ear tufts long. *Red phase:* Upperparts russet, indistinctly streaked with fuscous-black; underparts white, heavily mottled with tawny and marked with a little fuscous-black. *Gray phase:* Upperparts hair brown (dark drab), indistinctly lined with fuscous; underparts white, heavily mottled with hair brown and with narrow streaks of fuscous.

Range.—Gulf and South Atlantic States, from eastern Texas to South Carolina, and north in the Mississippi Valley to southern Illinois.

Distribution in Florida.—A common resident in all parts of the State, but less numerous in the northwestern part than in the central and southern parts. Specimens have been taken on Tottens Key, and the species is reported from Key Largo, Tavernier, Upper Matecumbe Key, and Key West.

Haunts and Habits.—The Florida Screech Owl is found in a variety of situations—the open pine forest, oak hammocks, orange groves, and the palmetto scrub along the ocean beaches. For a nesting site, the birds select an abandoned woodpecker's hole or a natural hollow in a dead stub, the entrance being anywhere from 6 to 25 feet above the ground. Doctor Ralph (Bendire, 1892, p. 359) once found a nest 80 feet above the ground, but this altitude is quite unusual. During the daytime, the birds are commonly found in their holes, and when incubating they can scarcely be induced to leave their charges. In southern Florida, the birds frequently spend the day in the thickest part of an orange or mango tree, sitting close to the trunk, and I once saw one sitting in a bush in the scrub at Sebring. When the Owls venture into the open in daylight, they are set upon at once by all the small birds in the vicinity—Mockingbirds, Crested Flycatchers, Blue Jays, and others.

At dusk the Screech Owls begin to forage for food and at such times their soft, weird whistle may frequently be heard. I have heard also from one of these Owls a weaker and lower pitched call, a sort of drumming note. They often live about farm buildings, and seek their prey in dooryards or gardens. Nesting begins early in March, and fresh eggs may be found in central Florida from about March 10 to the last of April, or in northern Florida from April 1 to May 1. The usual number of eggs is 3, sometimes 2 or 4.

Food.—Screech Owls feed very largely on mice and insects, and to a lesser extent on small birds. They rarely attack poultry, and in the main are considered beneficial. Of 255 stomachs examined by A. K. Fisher (1893, p. 173), 1 contained a pigeon; 38, other birds; 91, mice; 11, other mammals; 2, lizards; 4, batrachians; 1, fish; 100, insects; 5, spiders; 9, crawfishes; 2, scorpions; and 2, earthworms.

GREAT HORNED OWL: *Búbo virginiánus virginiánus* (Gmelin)

OTHER NAMES: Cat Owl; Hoot Owl

RECOGNITION MARKS.—The largest of the Florida owls (length, 18 to 25 inches; spread, 36 to 60 inches; wing, 13 to 16 inches); ear tufts very long; upperparts fuscous, finely mottled with white and shaded with ochraceous-buff; underparts white, shaded with ochraceous-buff and fuscous; feathers of abdomen with narrow fuscous crossbars.

RANGE.—Resident in eastern North America from Ontario, Quebec, New Brunswick, and Newfoundland south to the Gulf States, and west to South Dakota, Kansas, Oklahoma, and eastern Texas.

DISTRIBUTION IN FLORIDA.—Occurs in moderate numbers in all parts of the State. Recorded from Pensacola, Tallahassee, St. Marks, St. Vincent Island, Daytona Beach, Lake Apopka, Lake Butler, Sebastian, Bassenger, Jupiter, Immokalee, Bradenton, Fort Lauderdale, West Lake (near Cape Sable), and other places.

HAUNTS AND HABITS.—In central Florida, according to Doctor Ralph (Bendire, 1892, p. 379), the Great Horned Owl lives almost wholly in the pine forests. In northwestern Florida, Weston reports the birds inhabiting the big river swamps. On one occasion on the coast of Wakulla County in January, we saw one of these Owls sitting in a low bush on the edge of a marsh island. The birds are rather solitary in habit, living in the wildest sections and nesting usually in tall pines in old nests of the Bald Eagle or of one of the large hawks. Hallman (1929b, p. 99) describes a nest found *on the ground* in pine woods near St. Augustine, March 2, 1929; this nest was composed of a few parts of dry palmetto fans, grass stems, and small sticks, and contained two young birds less than a week old. The food of these birds consisted mainly of "large gray wood rats."

The eggs, usually two in number, are laid in midwinter, from about the middle of December to February. The hooting of this species is not so loud or so prolonged as that of the Barred Owl. Maynard says of its call (1881, p. 261):

> The usual cry consists of four notes which may be expressed as follows: *who-ho-ho-whoo*, the first two being given quite rapidly, then a pause of a second or two ensues and the third syllable comes out with emphasis, quickly followed by the last which is dwelt upon, often with a rising inflection just as though the birds were asking a question.

FOOD.—Concerning the Great Horned Owl in Florida, Doctor Ralph says (Bendire, 1892, p. 380): ". . . they feed almost entirely on waterfowl and the smaller mammals, such as rabbits, squirrels, gophers, mice, etc. I have never heard of their catching poultry in this region, and believe that they do not." In other sections, however, this big Owl has the reputation of being quite destructive to poultry and game birds. It feeds largely, also, on mice, cotton rats, wood rats, rabbits, and sometimes on skunks.

FLORIDA BURROWING OWL: *Speotýto cuniculária floridâna* Ridgway

OTHER NAME: Ground Owl

RECOGNITION MARKS.—About the size of the Screech Owl (length, 8.5 to 9 inches; spread, about 20 inches); *legs long* (tarsus, 1.75 inches). Upperparts drab, with large white spots on back and wings; underparts white, heavily blotched with snuff brown. (Plate 30.)

RANGE.—Resident locally on the prairies of central and southern Florida from northern Osceola County (St. Cloud) and Hillsborough County (Plant City) south to southern

Hendry County (Rocky Lake); recorded as breeding, also, at Hialeah and Miami Beach. The birds are most numerous on the Kissimmee Prairie, from the east side of Lake Kissimmee to Okeechobee and westward to Lake Istokpoga; on the prairies west of Lake Okeechobee, near Citrus Center; in Sarasota County, around Miakka and Miakka Lake; and in Charlotte County, near Bermont. A few were seen on Passage Key in 1906, 1907, 1910, and 1912, and they were reported nesting there, but this island has since been nearly washed away. A few birds have been seen on Sanibel Island, and one was recorded at Flamingo in 1921. Henry S. Gane mentions a single bird seen at Winter Park, February 28, 1902. Mrs. Byrd reported the species nesting at Erie, Manatee County, and we observed a nesting pair, May 14, 1929, near Plant City. Blatchley (1931, p. 295) states that a pair nested on Hog Island, near Dunedin, in 1929.

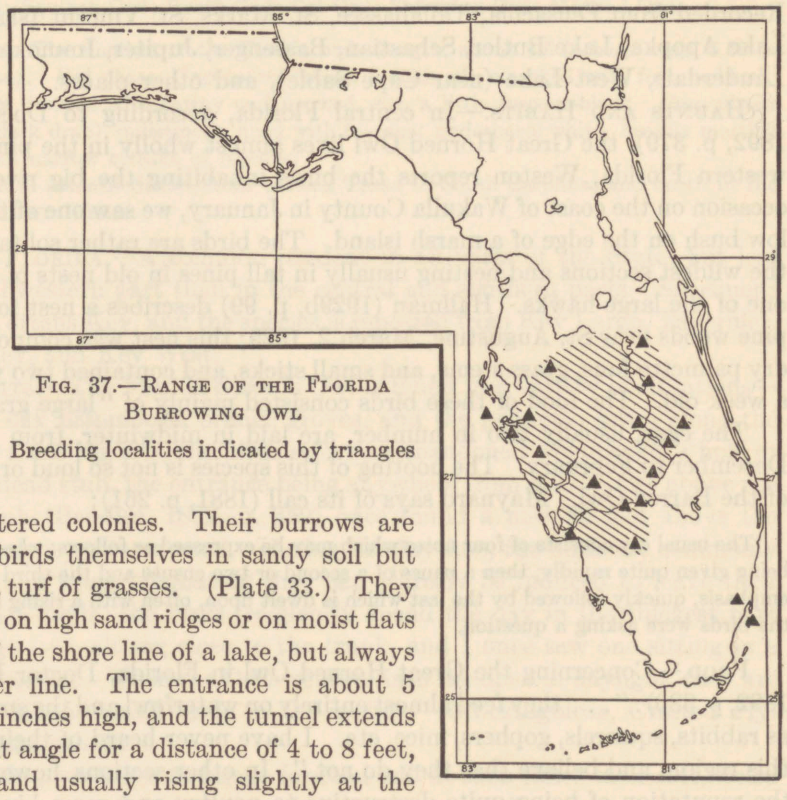


FIG. 37.—RANGE OF THE FLORIDA BURROWING OWL

Breeding localities indicated by triangles

HAUNTS AND HABITS.—The Florida Burrowing Owl is rather strictly confined to prairies or prairie-like regions, where the birds live in small, rather scattered colonies. Their burrows are usually dug by the birds themselves in sandy soil but often where there is a turf of grasses. (Plate 33.) They may be located either on high sand ridges or on moist flats within a few yards of the shore line of a lake, but always above the high-water line. The entrance is about 5 inches wide and 3½ inches high, and the tunnel extends downward at a slight angle for a distance of 4 to 8 feet, sometimes curving and usually rising slightly at the farther end, where the nest is placed in a circular cavity lined with pieces of dried cow dung, horse manure, grass roots, and bunches of hair. The nest cavity may be from six inches to nearly three feet beneath the surface. When the burrow is occupied there is certain to be considerable dried cow dung about the entrance. The sand scratched out of the burrow makes a rather conspicuous mound at the entrance, and on this mound one of the birds spends much of its time as a lookout. On the approach of a person, it usually flies a short distance and alights, facing the intruder, bows solemnly and often utters a tremulous, chuckling call, somewhat like the notes of the Upland Plover. The other one of the pair soon runs out of the burrow also and flies a short distance. Even when there is no bird on guard, the sitting bird nearly always leaves before

one can reach the entrance. The eggs, from 3 to 7 in number, are laid from about the middle of March to the last of May (fresh eggs at Miami, May 20, 1931).

These Owls apparently forage mainly during the twilight hours, but do some hunting in the daytime. Their flight is performed at no great height and in an irregular fashion with some periods of volplaning.

FOOD.—This little Owl is decidedly useful, since it feeds mainly on insects, varied with an occasional mouse or bird. Palmer (1896, p. 105) says all the stomachs examined by him contained the remains of crawfishes and beetles. Near one burrow examined at Citrus Center I found a part of a Red-winged Blackbird, together with numerous insect remains. In several burrows examined by D. J. Nicholson on the Kissimmee Prairie were found the remains of beetles, several crawfishes, one minnow, and two frogs (*Rana grylio*). The stomachs of 12 birds from the Kissimmee Prairie, examined in the Biological Survey, all contained insects, chiefly ground beetles of the genera *Strategus* and *Pterostichus;* one contained the remains of 25 caterpillars; one, a moth; one, a cricket; and one, only spiders. Three contained frogs; two, lizards; one, a toad; and one, the remains of a mouse or rat.

FLORIDA BARRED OWL: *Strix vāria ālleni* Ridgway

OTHER NAMES: **Hoot Owl; Swamp Owl**

RECOGNITION MARKS.—Smaller than the Great Horned Owl (length, 17 to 24 inches; spread, 40 to 50 inches; wing, 12.5 to 14.5 inches); head large, round, *without tufts;* wings relatively shorter than in the Short-eared Owl. Upperparts snuff brown or sepia, the feathers broadly edged with white or pale buff; *breast barred crosswise* with snuff brown and white; belly white or pale cinnamon-buff, *streaked lengthwise* with snuff brown.

RANGE.—Resident in southeastern United States from eastern Texas to North Carolina, and north to northern Alabama and Arkansas.

DISTRIBUTION IN FLORIDA.—A common resident in all sections. Specimens have been examined from St. Marks, Goose Creek, Gainesville, Ritta, Braden River, and Royal Palm Hammock. The species has been reported from Tavernier, on the Florida Keys.

HAUNTS AND HABITS.—The Florida Barred Owl dwells in the deepest swamps and in hammocks on the prairies. The birds often leave the woods at dusk and hunt their prey in open fields or even among the houses of small settlements. The loud hooting calls and catlike squallings of these birds may be heard on almost any night, particularly when the moon is bright, and occasionally also in the daytime. The eggs are laid usually in hollow limbs of trees or in the top of broken-off cabbage-palm stubs, or not infrequently in deserted nests of the Crow or the Red-shouldered Hawk. Nesting begins in December or January and continues through February and March. Eggs were found on Merritt Island, December 23, 1928; at San Mateo, January 15, 23, and 25, February 4 and 15, and March 3, 1892; on Kissimmee Prairie, January 14 and February 25, 1893; and on Miakka River, February 15, 1902. Two or three eggs constitute the set and but one brood is raised in a season.

FOOD.—Although this Owl has frequently been accused of capturing poultry, stomach examinations have shown that such instances are exceptional and that the ordinary food of the bird consists of mice, shrews, moles, squirrels, rabbits, frogs, crawfishes,

insects, and occasionally wild birds. Of the 109 stomachs examined by A. K. Fisher (1893, p. 156), 5 contained poultry or game; 13, other birds; 46, mice; 18, other mammals; 4, frogs; 1, a lizard; 2, fish; 14, insects; and 9, crawfishes. Among the birds eaten were a number of Screech Owls, showing an unusual taste bordering on cannibalism. Four stomachs of birds taken at Gainesville, Florida, contained the remains of mice, frogs, a lizard, crawfishes, grasshoppers, and a beetle. Of 9 stomachs recently examined in the Biological Survey from various parts of Florida, 3 contained crawfishes; 3, mammals—cotton rat (*Sigmodon hispidus*), deer mouse (*Peromyscus*), and water rat (*Neofiber alleni*); 3, the remains of fishes; and 1, a large beetle. Holt and Sutton (1926, p. 430) state that the Barred Owls at Cape Sable fed mainly on cotton rats.

LONG-EARED OWL: *Asio wilsonianus* (Lesson)

Recognition Marks.—Size, between that of the Barred Owl and the Screech Owl (length, 13 to 16 inches; spread, 36 to 42 inches; wing, 11 to 13 inches); *feather tufts on head very long.* Upperparts and wing coverts hair brown (dark drab), mottled with white and pinkish buff; underparts white, streaked with fuscous and washed with cinnamon-buff; underside of wings creamy white, the primaries mainly hair brown.

Range.—Breeds from central British Columbia, southern Mackenzie, southern Quebec, and Newfoundland south to southern California, northern Texas, Arkansas, and Virginia. Winters from southern Canada to Florida, Louisiana, and central Mexico.

Distribution in Florida.—A rare and irregular winter visitant. A specimen was taken at Cape Florida by Würdemann, and one at Key West, November 3, 1898, by Atkins. H. L. Ferguson states that he has collected this species at Cape Sable and at the Chassahowitzka River.

Haunts and Habits.—The Long-eared Owl inhabits wooded regions, living in dense thickets or bushy trees and hunting entirely at night. During the winter the birds sometimes gather into flocks up to 30 in number, all resting near together in a single tree. Bendire says (1892, p. 328):

> Except during the mating season it is rather a silent bird, and the few notes which I have heard them utter, when at ease and not molested, are low toned and rather pleasing than otherwise. . . . In the early spring they hoot somewhat like a Screech Owl, and may be often heard on a still evening, but their notes are more subdued than those of the latter.

Food.—The food of this Owl consists almost entirely of mice and other small mammals with a few small birds, chiefly sparrows. It never attacks poultry and should therefore be rigidly protected.

SHORT-EARED OWL: *Asio flammeus flammeus* (Pontoppidan)

Recognition Marks.—Larger than the Long-eared Owl; smaller than the Barred Owl (length, 12.5 to 17 inches; spread, 38 to 44 inches; wing, 11 to 13.5 inches); *ear tufts very short.* Entire plumage ochraceous-buff, streaked with fuscous; underside of wings pale pinkish buff, with large patches of hair brown (dark drab).

Range.—Nearly cosmopolitan. In North America, breeds locally from northern Alaska, northern Mackenzie, and Greenland south to California, Colorado, Kansas, Missouri, Indiana, and New Jersey. Winters from California, Wyoming, Minnesota, Ohio, and Massachusetts south to Cuba and Guatemala.

DISTRIBUTION IN FLORIDA.—A rare and irregular winter visitant. Specimens were taken by Worthington on Amelia Island, February 13 and March 13, 1906. Pennock saw but one bird at St. Marks (December 5, 1913). Williams (1914, p. 496) records 6 seen by Ludlow Griscom at Horseshoe Plantation, Leon County, in winter; and M. S. Crosby reports single birds seen at East Goose Creek, December 31, 1921, and January 3, 1922. Weston mentions a bird killed near Pensacola, November 26, 1930. R. D. Hoyt told me he had seen the species on several occasions at Seven Oaks. W. G. Fargo reported one seen on a marsh near Passage Key, February 2, 1926; and Worthington took a specimen at Miami Beach, November 28, 1922. I saw a single bird at Cape Sable, February 19, 1918, and Holt and Sutton (1926, p. 430) recorded two seen there March 14, 1924.

HAUNTS AND HABITS.—The Short-eared Owl is a lover of prairies and marshes and is never found in woods. These birds are not so strictly nocturnal as are most of the owls, but on cloudy days they may frequently be seen sailing and flapping low over the marshes in search of their prey. Their long wings give them the appearance of being larger than they really are.

FOOD.—Because of its fondness for mice and shrews, this species is considered mainly beneficial. Meadow mice are most often captured in its northern habitat, and in the South it destroys cotton rats. Of 101 stomachs examined by A. K. Fisher (1893, p. 149), 77 contained mice; 7, other mammals; 11, small birds; and 7, insects. Ground-dwelling sparrows are the birds most frequently captured.

GOATSUCKERS: FAMILY CAPRIMULGIDAE

CHUCK-WILL'S-WIDOW: *Antróstomus carolinénsis* (Gmelin)

OTHER NAMES: **Dutch Whip-poor-will; Spanish Whip-poor-will**

RECOGNITION MARKS.—Much larger than the Whip-poor-will and the Nighthawk (length, 11 to 12 inches; spread, about 25 inches). *Male:* Upperparts mouse gray, finely vermiculated with fuscous and cinnamon-buff and blotched with irregular spots and streaks of blackish brown; primaries fuscous-black with cinnamon spots; throat with a transverse band of white or pinkish buff; three outer tail feathers on each side with large white patches on inner webs; underside of tail mainly light pinkish cinnamon. *Female:* Similar, but lacking the white areas on tail feathers.

RANGE.—Breeds from southern Missouri, southern Indiana, southern Ohio, and southern Virginia south to the Gulf States and central Texas. Casual in Kansas and Maryland. Winters from Florida to the Greater Antilles, Central America, and Colombia.

DISTRIBUTION IN FLORIDA.—A common summer resident throughout the mainland and on some of the Upper Keys; winters in small numbers, chiefly in the southern half of the State. Some unusual winter records are: Lake Jackson, December 5, 1911 (R. W. Williams, 1914, p. 496); Orlando, December 1, 1885 (Browne, 1886b, p. 34); Clearwater, February, 1880 (Scott, 1881, p. 16); and Okeechobee, February 6, 1917. The bulk of the spring migrants arrive in March and April, some early dates of first appearance being as follows: Bassenger, March 1, 1907; Orlando, March 3, 1929; Palma Sola, March 5, 1911; Eau Gallie, March 6, 1910; Seven Oaks, March 9, 1902; Amelia Island, March 14, 1916; Daytona Beach, March 17, 1925; St. Marks, March 20, 1919; and Pensacola, March 25, 1918. Atkins, at Key West, noted the first birds on March 3, and

found them common from August 28 to September 18 (Scott, 1889a, p. 252). On the Tortugas, Scott (1890e, p. 310) records specimens taken, April 8 and 19, and May 1, 1890. It is difficult to obtain accurate dates of departure in the fall, but the records of Atkins at Key West, quoted above, indicate a rather early migration. The last individuals observed in autumn were recorded at St. Marks, September 24, 1915; Pensacola, October 21, 1916; and St. Vincent Island, November 1, 1910 (specimen). E. J. Court states that the birds breed on Manofwar Key, where he saw 3 pairs, March 29, 1925. A few were living in the Royal Palm Hammock in June, 1918.

HAUNTS AND HABITS.—The Chuck-will's-widow is a lover of dense hammocks and the borders of swampy woodland. The birds remain concealed in some secluded thicket or dark woods during the day, and at dusk they begin to utter their monotonous calls from which their name has been derived. These notes are entirely different from those of the Whip-poor-will, which are occasionally heard in Florida, but the two birds are very frequently confused under the name of the latter species, and few people in the South realize that they are not the same. The song of the Chuck-will is less vigorous than that of the Whip-poor-will; it consists of three notes, which sound to me like *chuck', will, will,* with a slight accent on the first syllable.

The birds seek their food near the ground, winging their way silently through copses and fields ready to snap up any flying insects that may come within reach of their capacious mouths. The eggs, two in number, are laid on the bare ground or on dead leaves, in hammocks or pine woods, with no attempt at a nest. Eggs were found at Miami, March 7, 1928; Dania, April 16, 1927; Seven Oaks, April 20 and June 10, 1908, and May 1, 1905; Gainesville, May 8, 1894; Malabar, April 17 and 24, 1927; and Titusville, June 30.

FOOD.—The food of this species consists mainly of large, night-flying moths, beetles, winged ants, and other insects. Numerous instances are on record of its capturing and swallowing small birds, such as hummingbirds, warblers, and sparrows. In the main, however, it is considered beneficial.

EASTERN WHIP-POOR-WILL: *Antróstomus vocíferus vocíferus* (Wilson)

RECOGNITION MARKS.—About the size of the Nighthawk (length, 9 to 10 inches; spread, 16 to 18 inches); smaller than the Chuck-will's-widow, which it much resembles in color, but the outer tail feathers have the *entire tip white* for 1.5 to 2 inches. Distinguished from the Nighthawk by *longer, rounded tail,* absence of white mark in wing, and mottled rather than barred underparts.

RANGE.—Breeds from Manitoba, southern Quebec, New Brunswick, and Nova Scotia south to northern Louisiana, northern Alabama, and northern Georgia; and west to Kansas, Nebraska, and North Dakota. Winters from lower South Carolina and Louisiana south to British Honduras and Salvador.

DISTRIBUTION IN FLORIDA.—An uncommon migrant and winter resident nearly throughout the State. First arrivals in fall were noted at Pensacola, October 9, 1918; Oxford, October 3, 1920; De Leon Springs, October 9, 1905; Princeton, October 4, 1917; and Royal Palm Hammock, October 11, 1917. Some of the winter records are: Northern Leon County, January 3, 1926; St. Marks, December 25, 1916, and January 6, 1918; Pensacola, December 25, 1928; Amelia Island, January 14, 1906; Orlando, January 10, 1913; Seven Oaks, December 18, 1907; Oxford, December 26, 1920; and Key Largo,

November 10, 1930. The last seen in spring were noted at De Funiak Springs, May 2, 1909, and at New Smyrna, May 15, 1924.

HAUNTS AND HABITS.—The Whip-poor-will is always a very shy and seclusive bird and during the winter season, when it is not in song, its presence is easily overlooked. It is difficult to distinguish in life from the Chuck-will's-widow, except by its voice, which is distinctive—a vigorous, sharply accented song, quite unlike the soft, monotonous notes of its larger cousin. The birds remain hidden during most of the day in a shady thicket or hammock, and at dusk often come out into an open road to feed and to dust themselves. At Royal Palm Hammock in January, 1918, I saw several at close range in the road leading through the dense jungle, and one in the open pine forest on Long Key, in the Everglades near the Hammock. At daybreak on January 28, a bird was heard singing a few times, and at Cape Sable, on February 11, one was heard singing for several minutes.

FOOD.—The food of the Whip-poor-will consists very largely of nocturnal moths; in addition, it is reported to capture cutworm moths, cranberry moths, ants, mosquitoes, May beetles, potato beetles, and grasshoppers (Forbush).

EASTERN NIGHTHAWK: *Chordeiles minor minor* (Forster)

OTHER NAMES: Bull-bat; Mosquito-hawk

RECOGNITION MARKS.—Nearly the size of the Whip-poor-will (length, 8.5 to 10 inches; spread, 21 to 23 inches), but with longer wings and shorter *forked* tail. *Male:* Upperparts fuscous-black, mottled with grayish white and pinkish buff; throat with a white band; belly dull white, with narrow crossbars of fuscous; primaries fuscous, *with a large white patch* across the middle; tail with a narrow white band near the tip. *Female:* Similar, but throat patch pale cinnamon-buff; white patch in wings smaller, and no white on tail.

RANGE.—Breeds from southern Yukon, central Mackenzie, northern Quebec, and Newfoundland south to northern Arkansas, southern Missouri, south-central Illinois, eastern Tennessee, and northern Georgia, and west to the edge of the Great Plains. Migrates through the Greater Antilles and Central America, and winters in South America from Colombia to Argentina.

DISTRIBUTION IN FLORIDA.—Doubtless an abundant spring and fall migrant, but since few specimens have been collected, it is not possible to give the dates of arrival and departure of this race as distinguished from the breeding form (*chapmani*). Oberholser (1914, p. 43) lists specimens of this race from the Dry Tortugas, April 13 and 14, 1890; Whitfield, April 15, 23, and 28, and May 2, 1903; and Amelia Island, April 20 and May 16, 1906. R. J. Longstreet observed a heavy flight of Nighthawks at Daytona Beach on May 11, 1926; in about an hour, from 6 to 7 p.m., he estimated that about 3,000 birds passed north over the beach. E. J. Brown, at Coconut Grove, noted a pronounced southward migration of this species on August 15, and from August 21 to 30, 1929. Late in the afternoons of August 26, 27, and 29 the birds streamed by in large numbers until dark. Doubtless some of the migration dates given under the Florida race (*chapmani*) may refer to the present form.

FLORIDA NIGHTHAWK: *Chordeiles minor chapmani* Coues

OTHER NAME: Bull-bat

RECOGNITION MARKS.—Closely similar to the northern race (*minor*), but smaller (length, 8.25 to 9.25 inches; wing, 6.77 to 7.56 inches).

RANGE.—Southeastern United States, breeding from Florida west to eastern Texas, and north to central Arkansas, southern Illinois, and eastern North Carolina. Winters in South America from Colombia to northern Argentina.

DISTRIBUTION IN FLORIDA.—An abundant summer resident throughout the State. Recorded by Scott (1889a, p. 252) from Key West in summer and from the Tortugas (1890e, p. 310) in migration.[1] Fowler reports one bird seen on Knights Key in June, 1904, and Audubon speaks of the species as a migrant on Indian Key. The birds seem to be irregular in their time of arrival from the South, but the majority appear during April. There are, however, several exceptionally early records, as follows: Eau Gallie, February 17, 1910 (Worthington); Orlando, March 20, 1909 (E. S. Hyer); and Palma Sola, March 29, 1909 (Eleanor Earle). Other dates of arrival are: Daytona Beach, April 3, 1923; St. Marks, April 4, 1916; Old Town, April 5, 1892; Bassenger, April 6, 1907; Whitfield, April 7, 1903; and Pensacola, April 8, 1919. The last seen in fall were noted at Tallahassee, October 13, 1904; Pensacola, October 26, 1918; Fernandina, October 23, 1906; Orlando, October 13, 1911; Royal Palm Hammock, November 4, 1917; and Pinellas County, November 10, 1924.

HAUNTS AND HABITS.—The Florida Nighthawk frequents open pine forests, old fields, pastures, prairies, cultivated lands, marshes, and ocean beaches. Although most active early in the morning and late in the evening, the birds frequently may be seen flying about in search of food in bright sunshine. As a rule, however, they spend the hotter parts of the day resting quietly on a horizontal limb of a tree, on a rail fence, or on the ground. Nighthawks are most graceful and skillful flyers, and all their food is taken on the wing. When the birds are feeding, the flight is erratic, as they twist and turn in pursuit of their prey, but when migrating they move with steady, straightforward strokes. During the nesting season, the birds frequently mount to a considerable elevation and dive with great speed toward the earth, arresting their flight with a quick movement of the wings, which produces a loud booming sound that resembles the noise made by blowing into the bunghole of an empty barrel. The common note, uttered by the birds in flight, sounds like the syllables *be-ub*. I once heard a Nighthawk, which was resting on a limb during the middle of the day, utter frequently a series of faint croaks, like *bah, bah, bah,* which were sometimes answered by the familiar *be-ub* note of its mate.

The two eggs are deposited on the ground, with no semblance of a nest, in an open situation, often in a pasture, broomsedge field, or wood lot, or in palmetto scrub in open forest or on the prairie, or sometimes among sparse grasses on or near the ocean beaches. Eggs were found at Thonotosassa, April 10, 1887; Bassenger, April 13, 1913; Carnestown, April 29, 1928; San Mateo, May 9, 1885; Daytona Beach, June 13, 1927; Orlando, May 15, 1911, June 13 and 24, 1917, and July 4, 1913; Seven Oaks, June 16 and 28, 1908; Marco, June 28, 1902; and Hillsborough County, July 29, 1888.

FOOD.—The Nighthawk is one of the most useful of our native birds, having no objectionable food habits. Winged ants appear to be a favorite food, these being found in nearly half of the stomachs examined in the Biological Survey. Other insects frequently eaten are May beetles, leaf hoppers, grasshoppers, gnats, and mosquitoes. Potato beetles and squash beetles are occasionally taken, as well as the destructive cotton-boll weevil.

[1] Specimens recorded from the Tortugas, April 17, 1890; April 20, 1902 (Oberholser, 1914, p. 78).

SWIFTS: Family Micropodidae

CHIMNEY SWIFT: *Chaetúra pelágica* (Linnaeus)

Other Names: Chimney Swallow; Chimney Bat

Recognition Marks.—About the size of the Barn Swallow (length, 4.75 to 5.5 inches; spread, 12 to 12.5 inches); wings very long and narrow; tail short, spiny-tipped; flies swiftly; resembles in appearance a cigar on wings. Plumage mainly sooty drab; throat pale smoke gray.

Range.—Breeds from central Alberta, southeastern Saskatchewan, Manitoba, central Quebec, and Newfoundland south to the Gulf coast, and west to the Plains (eastern Montana to eastern Texas). Winters south of the United States, at least to Vera Cruz and Cozumel Island, and probably in South and Central America.

Distribution in Florida.—A locally common summer resident over the greater part of Florida as far south as Homestead (H. H. Bailey, 1925a, p. 86). First arrivals in spring were reported at Okeechobee, February 24, 1930; Orlando, March 6, 1930; Lake Worth, March 21, 1894; lower Suwannee River, March 22, 1890; Daytona Beach, March 19, 1925; Tallahassee, March 21, 1905; and Pensacola, March 21, 1924. The last observed in fall were noted at Pensacola, November 8, 1921 (average date of departure, October 20); Tallahassee, October 26, 1906; Daytona Beach, October 23, 1924; Coconut Grove, October 23, 1929 (large flight); Cape Canaveral, October 24, 1905; and Sombrero Key, October 29, 1888. The last two records were of birds that struck the lighthouses. Large flights were noted at Orlando on October 7, 1927, and October 15, 1928.

Haunts and Habits.—The Chimney Swift formerly built its nests in hollow trees, and in thinly settled regions still does so, but at present it commonly uses chimneys for its home and is thus most numerous about towns and farmsteads. In some sections the Swifts place their nests in the lofts of barns or outhouses, these being fastened to rough boards near the roof. Ralph (Bendire, 1895, p. 178) obtained a set of eggs at San Mateo from a nest attached to the sides of a well and 4 feet below the surface of the ground, and was informed that this was a frequent practice of the birds in that locality. Nicholson reports a similar instance from Orlando, the nest being 10 feet below the surface in a boarded-up well. The nests are shallow, shaped like a half saucer, and made of small dead twigs that the birds break from trees while in flight, these being glued together and to the sides of the chimney by the birds' saliva. The pure white eggs, 4 to 6 in number, are deposited on the bare twigs. The only nesting dates at hand are from De Land, June 1, 1928 (4 fresh eggs), St. Marks, June 22, 1913 (6 eggs), and Eastport, June 23, 1930.

Swifts are accomplished flyers, and spend the greater part of the day on the wing, coursing rapidly back and forth, often at a great height, in search of their insect food, and constantly uttering sharp, twittering notes. They never alight in trees, but easily cling to the rough sides of a chimney or to a hollow tree. For several weeks prior to their departure for the South, the birds gather into large flocks and roost at night in a body in some large chimney or hollow stub. When the birds are about to enter a chimney, their flight is arrested suddenly and with wings raised high above the body, they drop perpendicularly into the opening. The noise produced as they enter or leave the chimney resembles the rumbling of distant thunder.

FOOD.—The food of the Chimney Swift consists of insects captured in the air; these include flies, mosquitoes, winged ants, beetles, bugs, and grasshoppers. The birds are wholly beneficial and their presence around the home should be encouraged.

McAtee (Pearson, 1911a, p. 117) writes of this species:

> The bird's food consists almost wholly of insects, . . . beetles, flies and ants are the principal items. It gets many beetles (*Scolytidae*), the most serious enemies of our forests, when they are swarming, and takes also the old-fashioned potato beetle (*Lema trilineata*), the tarnished plant-bug (*Lygus pratensis*), and other injurious insects.

HUMMINGBIRDS: FAMILY TROCHILIDAE

RUBY-THROATED HUMMINGBIRD: *Archilochus colúbris* (Linnaeus)

RECOGNITION MARKS.—The smallest Florida bird (length, 3 to 3.5 inches; spread, 4 to 5 inches). *Male:* Upperparts metallic bronze green; throat brilliant metallic red. *Female:* Similar, but throat buffy white.

RANGE.—Breeds from central Saskatchewan, Alberta, Manitoba, central Quebec, and Cape Breton Island south to the Gulf coast, and west to North Dakota, Nebraska, Kansas, and central Texas. Winters from Florida and Louisiana south to Panama.

DISTRIBUTION IN FLORIDA.—A common migrant and moderately common summer resident nearly throughout the State; a not uncommon winter resident in the southern part, and rarely as far north as Orlando (December 13, 1910), New Smyrna (December 18, 1925), and Coronado (January 24, 1926). Maynard (1881, p. 214) found the birds very abundant at Key West in winter, and Brown (1901, p. 199) reported them present all winter at Lemon City. They have been recorded also from Coconut Grove (January 8 to February 7, 1925, Chapman); Royal Palm Hammock (January 24, 1918); St. Lucie (December 15, 1918); and Passage Key (December 22, 1911).

Migration begins early in March or even in February. Helmuth (1920, p. 258) saw a Ruby-throat 6 miles off shore from Palm Beach, February 27, 1918; and Weston noted single birds at Pensacola, February 20 and March 6, 1927. The average date of arrival at Melrose for 12 years was March 13, the earliest date, February 24, 1906. One bird was seen at Chipley, February 28, 1910, although the usual date of arrival is about March 17. Other first arrivals were noted at Palma Sola, March 5, 1909; Gainesville, March 8, 1887; Whitfield, March 10, 1903; Tallahassee, March 11, 1903; Palatka, March 13, 1885; Amelia Island, March 17, 1906; Warrington, March 23, 1885; and Pensacola, March 28, 1922. Scott (1890e, p. 310) records the species common on the Tortugas, March 24 to April 2, 1890; Bartsch noted two birds there May 18 and 19, 1922. Seven birds struck the light on Sombrero Key on April 16, 1902. The last observed in fall were noted at Pensacola, October 25, 1925; Chipley, October 27, 1903; Tallahassee, October 25, 1906; and De Land, November 7, 1914.

HAUNTS AND HABITS.—The Ruby-throat may be found in a variety of situations, being attracted mainly by the presence of flower blooms, in which it obtains its food. It frequents dooryards and flower gardens, orchards, hammocks, and the borders of wooded swamps. The nest, a delicate and beautiful little structure, is placed on a hori-

zontal limb of a tree, at a height varying from 6 to 50 feet above the ground. Bendire (1895, p. 196) describes its composition as follows:

> The circular foundation is composed of bits of lichens, mixed with fine vegetable fibers, which are apparently firmly glued to the twig on which the nest is saddled, presumably with saliva secreted by the bird for this purpose, and the structure is built upon this, the inner portions of it being composed of soft, downy plant fibers. . . . After these have been well worked together in a sort of vegetable felt, the outer walls of the nest are profusely covered with a coating of bits of lichens obtained from the trunks and limbs of trees in the vicinity, and then are firmly fastened in place with spider webs, giving the nest the appearance of a small lichen-covered knot, which for this reason is rather difficult to detect.

There seems to be no available information regarding the species of trees preferred as nesting sites by the Florida hummers. Baynard (1913a, p. 245) says the birds nest in Alachua County from May 10 to June 25, and Longstreet found a nest with young near Ormond, May 20, 1925. The eggs, always two in number, are pure white.

Food.—This tiny bird feeds both on the nectar of flowers and on minute insects and spiders obtained from the blossoms. The stomachs examined by Beal (1918, p. 15) contained spiders, 43 per cent; Hymenoptera (ants, bees, etc.), 36 per cent; Hemiptera (leaf-hoppers, etc.), 8 per cent; and Diptera (gnats), 2 per cent.

KINGFISHERS: Family Alcedinidae

EASTERN BELTED KINGFISHER: *Megacéryle álcyon álcyon* (Linnaeus)

Recognition Marks.—Length, 11 to 14 inches; spread, 21 to 23 inches; bill, 1.75 to 2.25 inches; bill stout, longer than head; head with double-pointed crest. Upperparts and a wide band across breast blue-gray; underparts white; female with an additional band of russet across and down the sides of the belly.

Range.—Breeds from Mackenzie, central Quebec, and Newfoundland south to the southern border of the United States. Winters from British Columbia, Nebraska, Illinois, Ohio, and Virginia south to the West Indies, Colombia, and British Guiana.

Distribution in Florida.—A common resident throughout the State, except on the Florida Keys, where it occurs as a migrant or winter resident. Scott (1890e, p. 310) reports the species numerous on the Tortugas late in April; specimens have been taken there, October 8, 1917, and March 13, 1918; and Bartsch records the birds present May 2 to 5, 1913; May 16 to 19, 1922, and August 16 to 23, 1925. At Key West, Atkins reported them common in winter, but saw none between May 22 and August 30, 1888 (Scott, 1889a, p. 251). Five birds struck Sombrero Key Light on November 29, 1886, and one March 4, 1889. Mrs. Brodhead found the birds common on Upper Matecumbe, January to April, 1906, and M. S. Crosby noted two individuals at Newfound Harbor, February 26, 1925. In northern Florida, Kingfishers are less numerous in winter than in summer, but in southern Florida the reverse is true, owing probably to lack of suitable nesting sites in the latter region.

Haunts and Habits.—Kingfishers are found on all the streams, lakes, bays, and bayous in the State. They frequent the ponds and ditches on the salt marshes and in the Everglades, and are seen sometimes about little sloughs or pools in the timbered swamps or the pine woods. On the Keys they live largely in the mangroves that fringe the islands. They are rather solitary in habit, and usually a pair preempts a certain

range, keeping other birds away, but sometimes several pairs may be found living around a single pond. The birds spend much time sitting on some favorite perch over the water, intently scanning the surface until a fish is discovered, when the bird launches into the air, hovers for a few moments over its prey, then plunges into the water, disappearing from sight, and emerges with a wriggling fish in its bill, which it carries to a convenient perch to devour or to its nest to feed the young. The flight of the Kingfisher is swift and well sustained, the bird giving vent as it flies to a loud, rattling call.

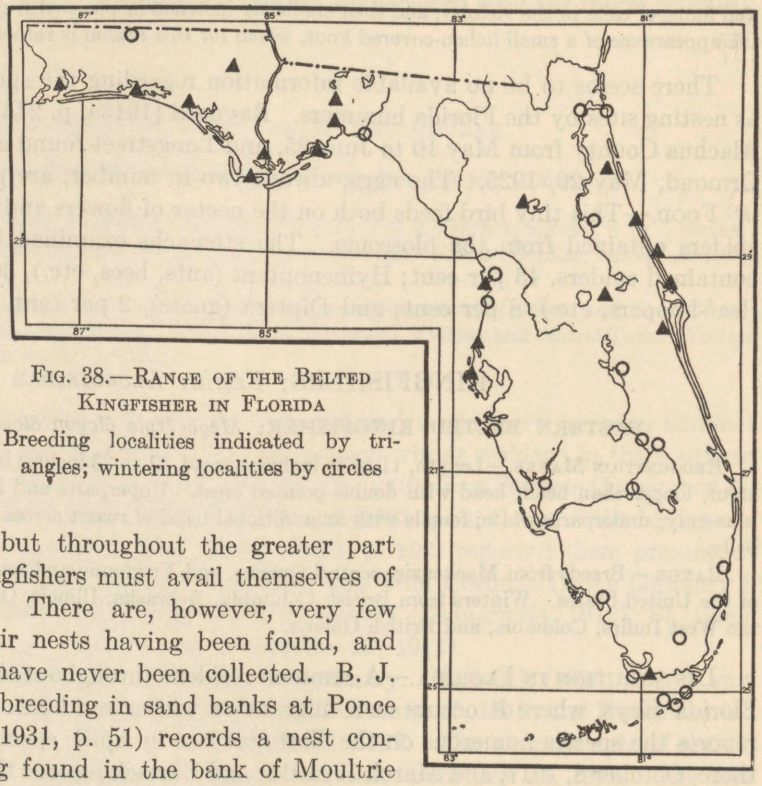


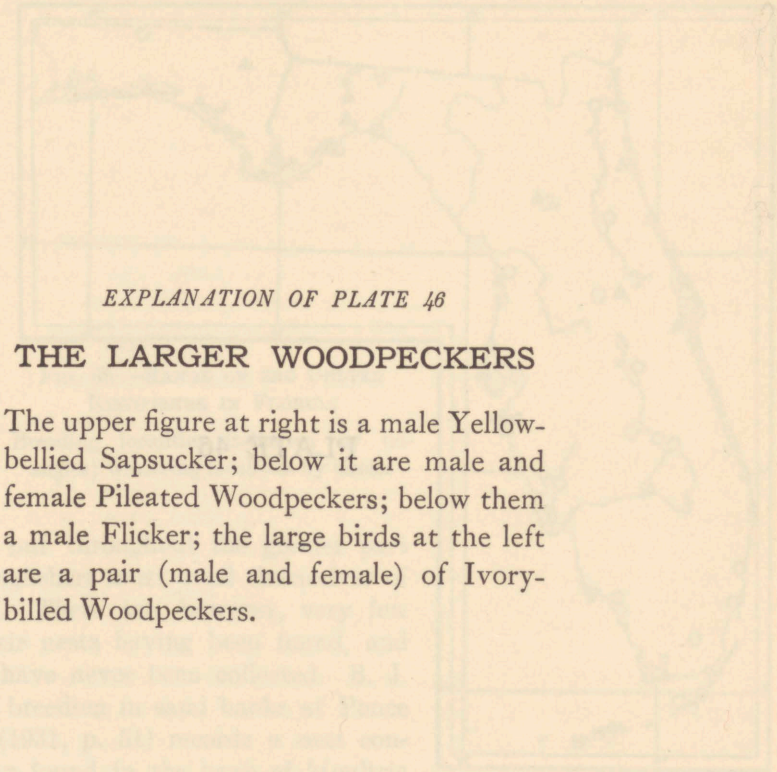
FIG. 38.—RANGE OF THE BELTED KINGFISHER IN FLORIDA

Breeding localities indicated by triangles; wintering localities by circles

The usual nesting site of the Kingfisher is a burrow dug by the birds in the face of a sand or clay bank. The tunnels are nearly circular in outline, averaging about 4 inches in diameter and from 3 to 15 feet in length. Banks of this character are found in parts of northern Florida, but throughout the greater part of the State the Kingfishers must avail themselves of other nesting places. There are, however, very few actual records of their nests having been found, and apparently the eggs have never been collected. B. J. Pacetti reports them breeding in sand banks at Ponce Park, and Hallman (1931, p. 51) records a nest containing 3 large young found in the bank of Moultrie Creek, St. Johns County, May 16, 1930. Maynard (1881, p. 197) mentions seeing a dozen holes in a shell bank along the canal connecting Indian River with Mosquito Lagoon, one of which was occupied by a pair of birds. Doctor Ralph stated that he had found Kingfishers occupying old burrows of the Rough-winged Swallow. Bryant Cox reports the nesting of two pairs on a shelf of a rocky embankment at Rock Ledge; the eggs, in this instance, could be seen from the outside. H. L. Ferguson says that he has found eggs of the Kingfisher in a hollow mangrove stub at Flamingo. Baynard (1913a, p. 245) writes that in Alachua County the Kingfisher nests early in April in holes in dead trees or stubs over water. He states, also (verbally), that he once found a nest at Clearwater, 4 feet above water in a leaning stub, the entrance hole being on the under side; this nest contained 4 eggs on May 6.

FOOD.—A study of the food habits of the Kingfisher by E. R. Kalmbach, based on the examination of 313 stomachs in the Biological Survey, showed that nearly three-

PLATE 46



EXPLANATION OF PLATE 46

THE LARGER WOODPECKERS

The upper figure at right is a male Yellow-bellied Sapsucker; below it are male and female Pileated Woodpeckers; below them a male Flicker; the large birds at the left are a pair (male and female) of Ivory-billed Woodpeckers.

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fourths of the bird's food obtained under natural conditions (i.e., away from fish hatcheries) consisted of fishes, about two-fifths of which were of edible varieties. Perch (mainly *Perca flavescens*) were found in 16 stomachs; catfishes in 15; flounders in 13; sunfishes in 9; and carp in 3. Nonedible fishes were identified in 82 of the 162 stomachs taken under natural conditions; small minnows were present in 57 stomachs; sculpins in 8; and sticklebacks, killifishes, and menhaden comprised the remainder. Crawfishes were present in 39 stomachs, furnishing about 16 per cent of the total food; frogs formed more than 5 per cent, and insects, mainly dragon-fly nymphs and water beetles, 4 per cent.

According to an observer at Green Cove Springs, a Kingfisher living on the river close to a dwelling was seen to visit a sour-gum tree and feed on the berries when the roughness of the water made it difficult to procure fish (Coues, 1878, p. 92).

WOODPECKERS: Family Picidae

SOUTHERN FLICKER: *Colăptes aurâtus aurâtus* (Linnaeus)

Other Names: **Yellowhammer; Highhole; Golden-winged Woodpecker; Yellow-shafted Flicker; Cotton-backed Yellowhammer**

Recognition Marks.—Larger than the Red-headed Woodpecker (length, 12 to 13 inches; spread, 18 to 21 inches; bill, 1.25 to 1.45 inches); bill rather slender and more curved than in most woodpeckers. Shafts and underside of flight feathers bright yellow; underside of tail feathers mustard yellow, the tips black; throat and breast wood brown (light brown), *bordered below by a black crescent* (male has a black patch on each side of face); a scarlet crescent on nape; underparts yellowish white, *with large round black spots; rump patch white*, very conspicuous in flight. (Plate 46.)

Range.—Lower Austral Zone of South Atlantic and Gulf States, from central Texas and the Gulf coast north to North Carolina and southern Illinois.

Distribution in Florida.—A common resident throughout the State, though less numerous in the southern counties, and not known to breed on the Florida Keys. Specimens of the typical race have been examined from St. Marks (June 9, 1913), Wilson (April 4, 1923), Jupiter (March 15, 1918), Manatee (June 12, 1918), Miakka Lake (June 18, 1918), Royal Palm Hammock (June 17, 1918), and Long Key (Everglades) (January 28, 1918). The birds have been seen in the breeding season at Fort Pierce, Fort Lauderdale, Larkin, Coconut Grove, and other places. Holt and Sutton (1926, p. 431) record a nest found at Flamingo, March 15, 1924. Mrs. Brodhead reports one bird seen on Upper Matecumbe Key, February 7, 1910, and Atkins (Scott, 1889a, p. 252) says this species is rare at Key West, being seen only in the fall.

Haunts and Habits.—Flickers are generally distributed in Florida and may be found in a variety of situations. They are perhaps most numerous in open pine forests, but occur also in hammocks, on the borders of swamps, in clumps of trees on the prairies, and in the Everglades wherever trees are growing. The nests are placed in pines, oaks, cabbage palms, or other trees, at heights varying from a few feet to 60 feet above the ground. At Ponce Park, in May, 1925, I observed a Flicker using a hole in a palmetto pile under the dock on the shore of the Halifax River, only 2 feet above the salt water at high tide. Nicholson found a nest 12 inches above the ground in a sawed-off stump of a palmetto on a ditch bank, 4 miles west of Indian River City. Nesting begins late in March or

early in April; eggs have been found on Merritt Island, March 29, 1925; at San Mateo, April 2 and 12, and May 1 and 10, 1893; Winter Park, April 9, 1914; Archer, April 20, 1888, and July 18, 1889; and Seven Oaks, May 5, 1903. The eggs vary in number from 5 to 9.

Flickers are sociable and friendly birds, often living close to human habitations and feeding extensively in gardens, cultivated lands, orchards, and pastures. Much of their food is obtained from dead stubs where ants abound, and from the ground. They have a variety of interesting notes, the commonest being their loud, penetrating *clape* and the *whick-ah, whick-ah* notes when at play.

Food.—The Flicker takes a great variety of food, which extensive stomach examinations by Beal (1911, pp. 52–58) have shown to consist of approximately 61 per cent animal matter and 39 per cent vegetable. Ants seem to be the favorite food and are eaten in every month. They constitute almost exactly half of the total food and were found in 524 of the 684 stomachs examined. Ninety-eight stomachs contained no other food. Professor Beal mentions one stomach and crop filled with very small ants, which he estimated to number more than 5,000. The Flicker's fondness for these insects doubtless furnishes the principal reason for its habit of feeding on the ground. The remainder of the animal food is made up of beetles, grasshoppers, and crickets, with a few caterpillars, spiders, myriapods, crustaceans, and snails.

The vegetable food consists mainly of small wild fruits, of which 31 species have been identified. Mast is taken only occasionally, chiefly in winter, and corn was found in only 17 stomachs. On the Kissimmee Prairie, Hoxie observed Flickers feeding on the acorns of a species of dwarf oak that grows about 8 inches high.

NORTHERN FLICKER: *Colăptes aurâtus lûteus* Bangs

Recognition Marks.—Similar to the resident race (*auratus*), but slightly larger (wing, 5.90 to 6.50 inches).

Range.—Breeds throughout northern and central United States east of the Rocky Mountains, except North Dakota and Minnesota, south to northern Alabama and northern Georgia. Winters south to southern Texas and the Gulf coast of Alabama and Florida. (Another race ranges north to tree limit in Alaska and Canada.)

Distribution in Florida.—Probably of regular occurrence in winter in the northern part; known at present only from two specimens collected at St. Marks, March 17, 1917, and March 10, 1919 (Pennock, 1920a, p. 11), and one taken at Whitfield, January 23, 1903.

PILEATED WOODPECKER: *Ceóphloeus pileâtus pileâtus* (Linnaeus)

Other Names: Logcock; Woodcock; Woodchuck; Wood-cady; Good-god; Lord-god

Recognition Marks.—Smaller than the Ivory-bill (length, 15 to 17 inches; spread, 25 to 28 inches; bill, 1.65 to 2.00 inches). Head crested, scarlet red; plumage mostly fuscous-black, except for white throat and a white stripe from base of bill down sides of the neck; *lining of wings white*, conspicuous in flight. (Plate 46.)

Range.—The forests of southeastern United States from North Carolina south to Florida, and west to middle Texas and western Oklahoma.

DISTRIBUTION IN FLORIDA.—Resident throughout the State.[1] Recorded from Blue Cypress Lake, Immokalee, Little River, Miami River, Royal Palm Hammock, and many other places. J. T. Nichols reports one seen on Manofwar Bush.

HAUNTS AND HABITS.—The Pileated Woodpecker in Florida inhabits several different types of country—pine woods, cypress swamps, hardwood swamps, and hammocks of cabbage palmetto and other trees. The birds are perhaps most numerous in hammocks or swamps, where there is an abundance of decaying trees. We found a number of pairs breeding in cypress trees along the borders of Lake Istokpoga. The nests are excavated either in living trees or in rotten stubs, from 12 to 75 feet from the ground. The trees commonly used for nesting sites are cypress, pine, black gum, oak, and cabbage palmetto. The eggs, numbering from 3 to 5, are laid from March to May (Istokpoga Lake, March 24, 1923; Putnam County, April 20, 1892; Everglade, May 4, 1928).

Although in most sections a very wary bird, this species in the wilder parts of the South is remarkably tame. A bird whose nest we were examining in a rotten stub in the swamp along Istokpoga Creek persisted in returning to the nest hole in spite of our efforts to scare her. During the mating season these Woodpeckers are rather noisy, and in addition to uttering their loud flicker-like call, they do considerable drumming on dry stubs. The flight of the birds is strong and steady, with rather slow flappings, and with less undulating than in that of the other species of woodpeckers.

FOOD.—This large Woodpecker is a decidedly useful species. It never injures farm crops, but feeds entirely in the forests, rendering good service there in the destruction of wood-boring beetles. It eats, also, ants and wild fruits and berries, including the fruit of the sour gum, tupelo gum, dogwood, persimmon, frost grape, holly, poison ivy, sumac, and hackberry (Beal, 1911, p. 170). Maynard (1881, p. 235) states that the birds are very fond of palmetto berries.

RED-BELLIED WOODPECKER: *Centúrus carolínus* (Linnaeus)

OTHER NAMES: **Zebra Woodpecker; Guinea Sapsucker; Orange Sapsucker; Cham-chack**

RECOGNITION MARKS.—About the size of the Red-headed Woodpecker (length, 8.5 to 10 inches; spread, 16 to 18 inches). *Male:* Top of head and nape scarlet; underparts and wings black, barred with white; underparts pale smoke gray, tinged with yellow (or sometimes with red), with a strong wash of red on the abdomen. *Female:* Similar, but top of head smoke gray, only the nape and back of head being scarlet. (Plate 45.)

RANGE.—Breeds from southeastern South Dakota, southeastern Minnesota, southern Ontario, western New York, and Delaware south to central Texas, the Gulf coast, and southern Florida.

DISTRIBUTION IN FLORIDA.—An abundant resident throughout the State, including most of the Keys. Recorded from Upper Matecumbe, Indian Key, Tea Table, Grassy,

[1] Careful study of a large series from Florida in comparison with a series of typical *pileatus* from the Middle States shows no constant difference in color, as claimed by Ridgway for the subspecies "*floridanus*"; evidently specimens kept for some years become more brownish (less sooty), which fact probably explains Ridgway's mistake, he having compared fresh Florida skins with older skins from the Middle States. Measurements taken of the bills of 40 specimens from Florida and of 50 specimens from the Middle States show only slight differences; bills of the Florida birds averaged .9 mm. smaller in the males and 1.5 mm. smaller in the females.

Knights, Ramrod, Newfound Harbor, Pigeon, Boca Chica, and Big Pine Keys, and Key West.

HAUNTS AND HABITS.—In Florida, Red-bellied Woodpeckers are found chiefly in hammocks, groves, and wet bottomland timber, less commonly in the pine woods and the cypress swamps. They are numerous in the hammocks on the borders of the Everglades and in the coconut groves at Cape Sable. Almost any kind of a tree will satisfy the birds for a nesting site, but a partly decayed stub seemingly is preferred. Where cabbage palms occur, a dead stub of that tree is often chosen, and cavities in oaks, cypresses, pines, and other trees are frequently utilized, the entrance hole being anywhere from 5 to 70 feet from the ground, usually, however, under 40 feet. Nesting begins in April and continues until June. Six eggs, half incubated, were found at Turkey Lake, Orange County, April 22, 1917; two nests with young at Seven Oaks, April 26, 1905; and five nearly fresh eggs at Micanopy, June 12, 1910.

These Woodpeckers are not particularly shy, and they often visit dooryards and orchards. They are active and noisy, their call notes resembling those of the Red-head very closely.

FOOD.—The food of the Red-bellied Woodpecker comprises both insects and vegetable matter, the latter forming more than two-thirds of the total. Acorns, beechnuts, hazelnuts, and pecans together amounted to about 30 per cent of the total food in the stomachs examined by Professor Beal (1911, pp. 47–52), and a great variety of wild fruits and berries, with a little corn, made up the remainder. The birds cause some damage to the orange crop by puncturing the ripe fruit. They destroy many insects, however, including ants, grasshoppers, and caterpillars, as well as the eggs of cockroaches.

RED-HEADED WOODPECKER: *Melanérpes erythrocéphalus* (Linnaeus)

OTHER NAMES: **Redhead; Whitewing**

RECOGNITION MARKS.—Length, 8.5 to 9.5 inches; spread, 16 to 18 inches. *Adult:* Head, neck, and breast carmine; back and fore part of wings glossy blue-black; *ends of secondaries white,* forming a very prominent patch; underparts white. *Immature:* Head drab, streaked with black; throat streaked with mouse gray; back fuscous, blotched with white; secondaries with fuscous bars. (Plate 45.)

RANGE.—Breeds from southeastern British Columbia, central Alberta, Manitoba, and southeastern Ontario south to the Gulf coast; west to central Montana, central Colorado, and central Texas; and east to the Valleys of the Hudson and Delaware Rivers. Rare and local in New England. Irregularly migratory in the northern parts of its range.

DISTRIBUTION IN FLORIDA.—A locally common resident over most of the State, except the extreme southern portion. Irregularly migratory in winter, and less numerous in winter in the northern parts. Weston reports it abundant in summer at Pensacola, a few remaining all winter. Williams (1904, p. 455) records it as common in summer in Leon County, but less numerous in winter. Chapman (1888a, p. 271) says it is common some winters, rare in others, at Gainesville. It is reported as common in winter at Winter Park, Homosassa, Moore Haven, La Belle, Sanibel Island, and Miami, but has not been recorded from the Cape Sable region or from the Keys, except for a single occurrence on the Tortugas—a bird seen there on a number of days early in June. It has been noted in the breeding season as far south as Punta Gorda and Hypoluxo, and from Orange County northward it is a common breeder.

HAUNTS AND HABITS.—The Red-head is the most domestic of our woodpeckers, living frequently in the heart of populous towns and nesting in telephone poles on village streets. The birds are especially attracted to newly cleared lands, where many dead or girdled trees are left standing. They are common, also, in open pine forests in certain sections, but in other seemingly suitable localities are not to be found. They are usually quite unsuspicious, and are sociable and frolicsome, playing hide-and-seek with one another and amusing themselves by drumming on dead stubs or on tin roofs or cornices of buildings. Their ordinary note is a loud *tchur-tchur*, resembling the notes of the tree frog. Most of their food is obtained from rotten stubs or from the ground, but the birds are experts at catching insects on the wing.

Nesting begins about the first of May and continues through the summer until August, two broods being sometimes reared. The eggs commonly number 4 or 5, rarely as many as 7. D. J. Nicholson found young birds in a hollow electric light pole at Orlando on August 29, 1912, an earlier brood having been raised in the same nest. Fresh eggs were taken at Gainesville, May 23, 1900.

FOOD.—An exhaustive study of the food habits of the Red-head by Beal (1911, p. 42) showed that about two-thirds of its food consists of vegetable matter and one-third of insects. The vegetable matter is composed chiefly of corn and other grains, fruits, berries, and mast (acorns, beechnuts, etc.). The bird is frequently condemned by farmers on account of its habit of destroying corn, and numerous observers have described its attacks on the eggs and young of other birds, such as the Cliff Swallow, Tufted Titmouse, nuthatches, and chickadees (cf. Bendire, 1895, p. 108). Professor Beal sums up its economic status as follows:

> No species of woodpecker in this country, with the possible exception of the yellow-bellied sapsucker (*Sphyrapicus varius*), has been the subject of so much adverse criticism as the redhead. It has been accused of eating nearly every variety of cultivated fruit from strawberries to oranges, of pecking corn from the ear, of eating the eggs of poultry and pigeons, of pecking open the skulls and devouring the brains of young poultry, and of destroying the eggs or young of eaves swallows and other birds. These accusations are well grounded, but the habits are probably only local. These reports have been received from hundreds of localities, but in thousands of other places where the bird abounds no such acts have been observed. Stomach examination confirms to some extent the corn-eating habit, and to a less degree the fruit-eating, but fails entirely to show that the bird habitually eats young birds or eggs. Where this bird has done appreciable harm, it has probably been due to new and unusual conditions likely to be temporary. . . . On the whole, there seems to be no reason to condemn the woodpecker except under very unusual conditions. (Beal, 1911, p. 42.)

YELLOW-BELLIED SAPSUCKER: *Sphyrapicus vârius vârius* (Linnaeus)

OTHER NAME: **Yellow-bellied Woodpecker**

RECOGNITION MARKS.—The size of the Red-cockaded Woodpecker (length, 7.25 to 8.25 inches; spread, 14 to 16 inches). Underparts pale yellow or yellowish white, *with a large black patch on breast;* throat red in the male, whitish in the female; *crown carmine*, bordered with black; a large longitudinal patch of white on the wing. (Plate 46.)

RANGE.—Breeds from central Mackenzie, central Alberta, southern Quebec, and Cape Breton Island south to central Missouri, central Indiana, western Massachusetts (mountains), and western North Carolina (mountains). Winters from Iowa, Michigan, and Massachusetts south to the Gulf coast, Bahamas, Cuba, western Mexico, and Costa Rica.

DISTRIBUTION IN FLORIDA.—An abundant spring and fall migrant and a fairly common winter resident in all sections. The first migrants in fall were noted at Pensacola, October 4, 1929, and October 11, 1925; De Funiak Springs, October 7, 1908; Tallahassee, October 9, 1904; Orlando, October 12, 1910; St. Lucie, October 27, 1918; and Sombrero Key, October 29, 1888. Scott (1889a, p. 251), on the authority of J. W. Atkins, states that the species arrives at Key West early in September and can be found there occasionally throughout the winter, but this early date seems inconsistent with the above dates from the mainland.

Considerable numbers of this species have been recorded from the Sombrero Key Light on various dates in March, April, October, and November. On the night of November 4, 1888, 16 birds struck the light; on April 3, 1889, 25 birds; and on March 25, 1887, 40 birds; although in each case only a few were killed. Scott took 6 specimens on the Tortugas between March 25 and April 8, 1890.

The last seen in spring were noted at Alligator Lake, Monroe County, March 26, 1924; Gainesville, April 21, 1887; Wakulla County, March 26, 1914; Whitfield, March 30, 1903; Pensacola, April 13, 1926; Daytona Beach, April 29, 1929; and Key Largo, May 5, 1919.

HAUNTS AND HABITS.—During their sojourn in Florida the Yellow-bellied Sapsuckers frequent the pine woods and cypress swamps and to a lesser extent, the hammocks. They are rather quiet, unobtrusive birds, not especially active, and easily recognized by their peculiar "mewing," or squealing, calls. Some of their notes, also, resemble a weak call of the Blue Jay. These Sapsuckers are less truly woodpeckers than most other members of the family, for they never dig deeply beneath the bark of trees for the wood-boring larvae, but puncture the bark with a series of small holes, which they visit regularly to drink the sap that flows from the holes and to pick up insects that may be attracted by the sap.

FOOD.—The habit this species has of puncturing forest trees results in serious damage to the trees and sometimes causes their death. The wood of such trees is disfigured and its value as lumber is thus reduced. According to McAtee (1911d, p. 21), the trees most often attacked in the South are long-leaf pine, cypress, black walnut, hickory, oak, maple, holly, and basswood. In addition to the sap, the birds consume some of the inner bark of the punctured trees. They eat, also, many insects, chiefly ants, and a variety of wild fruits and berries, including the fruit of the sour gum and dogwood, frost grapes, blackberries, and blueberries.

SOUTHERN HAIRY WOODPECKER: *Dryóbates villósus aúduboni* (Swainson)

OTHER NAMES: **Big Sapsucker; Big Guinea Woodpecker**

RECOGNITION MARKS.—Length, 7.5 to 8.5 inches; spread, about 14 to 15 inches. Upperparts black or fuscous-black, with a white stripe on side of neck and another above the eye, reaching on to the back of the head; middle of back with broad white stripe; wings with large squarish spots; underparts white; male with a red band across the occiput; underside of tail white, *unspotted.* (Plate 45.)

RANGE.—Lower Austral Zone of South Atlantic and Gulf States north to southeastern Virginia, southern Illinois, and southeastern Missouri, and west to southeastern Texas.

DISTRIBUTION IN FLORIDA.—A rather uncommon resident, but generally distributed in wooded sections throughout the State, except on the Florida Keys. Specimens have been examined from St. Marks, Amelia Island, Jacksonville, New Smyrna, Enterprise, Welaka, Eau Gallie, Tarpon Springs, Seven Oaks, Fort Myers, Miakka Lake, and Immokalee. Holt and Sutton (1926, p. 431) record a specimen taken on Long Pine Key (in the Everglades, near Royal Palm Hammock), and another seen at 'Gator Lake. T. D. Burleigh saw one at Miami, December 9, 1929.

HAUNTS AND HABITS.—The Southern Hairy Woodpecker, though not particularly shy, prefers the wilder sections for its home. It occurs in a variety of situations—the open pine forests, oak hammocks, and the hardwoods of the deep river swamps. The birds are of a rather solitary disposition, and rarely is more than a single bird or a pair found near together. The nests are located 12 to 45 feet from the ground in holes excavated in dead oaks or willow stubs, or in cypresses growing on the edge of a swamp. Doctor Ralph collected 5 sets of eggs in Putnam County between April 23 and 28, the eggs numbering 3 or 4 in a set, and on those dates being well advanced in incubation, (Bendire, 1895, p. 51). D. J. Nicholson took fresh eggs at Apopka, May 3, 1910, and April 18, 1920.

FOOD.—The food habits of this species indicate clearly its usefulness as a destroyer of harmful insects. A large percentage of its food consists of ants and the larvae of wood-boring beetles, and caterpillars and weevils make up most of the remainder of the animal food. The vegetable food comprises chiefly wild fruits, seeds of various plants, mast, and some corn, largely waste grain taken in winter (Beal, 1911, pp. 13–17). Bendire (1895, p. 51), apparently referring to the species in Florida, states that the young are fed mainly on figs.

SOUTHERN DOWNY WOODPECKER: *Dryóbates pubéscens pubéscens* (Linnaeus)

OTHER NAME: Little Sapsucker

RECOGNITION MARKS.—Much smaller than the Hairy Woodpecker (length, 5.50 to 6.10 inches; spread, about 10 to 11 inches), but essentially like it in coloration, except for the under tail coverts, which are barred with fuscous. (Plate 45.)

RANGE.—The South Atlantic and Gulf States from North Carolina to eastern Texas (except in the higher Alleghenies where another subspecies occurs).

DISTRIBUTION IN FLORIDA.—A moderately common resident in all sections except on the Keys; more common in the northern than in the southern part of the State. Specimens have been examined from Southport, Seven Oaks (near Safety Harbor), Braden River, Caxambas, Jupiter, and Fort Lauderdale. Holt and Sutton (1926, p. 431) collected a specimen on Long Pine Key, in the southern Everglades, and saw several birds at Flamingo. Nicholson observed the species on Turners River, Collier County.

HAUNTS AND HABITS.—The Downy Woodpecker is the smallest and perhaps the best known of the woodpeckers. It occurs alike in pine woods, hammocks, orchards, roadside hedges, and dooryards. It is not shy, and is of a sociable disposition, often associating in winter with little companies of other small birds, such as chickadees and nuthatches. In its voice and general appearance it much resembles its larger relative, the Hairy

Woodpecker. The tattoo that it often beats on some resonant stub is similar also to that produced by the Hairy, though not so loud.

The nest of the Downy is usually dug in a decaying limb of a tree or occasionally in a fence post, and may be anywhere from 5 to 50 feet above the ground. The eggs, from 3 to 6 in number, are laid about the last of April. Doctor Ralph took a set of 5 in Putnam County, April 30, 1892, and C. J. Pennock found young birds just hatched at St. Marks, May 20, 1914.

Food.—Although commonly referred to as a "sapsucker," the Downy Woodpecker is wholly insectivorous and is one of our most beneficial species. Its diet, as shown by studies in the Biological Survey, is made up of 76 per cent animal matter and 24 per cent vegetable. Of the insect food, beetles and ants constitute the largest items, each amounting to about 21 per cent; caterpillars form about 16 per cent. Other animal food eaten includes bugs, scale insects, plant lice, and the eggs of grasshoppers, crickets, katydids, and cockroaches. Fruit amounted to only about 6 per cent of the total food contained in the stomachs examined, and most of it was of useless wild varieties. Corn in small quantities was found in 20 stomachs. (Beal, 1911, pp. 18–22.)

RED-COCKADED WOODPECKER: *Dryóbates boreális* (Vieillot)

Other Name: Sapsucker

Recognition Marks.—Slightly smaller than the Hairy Woodpecker (length, 7 to 8 inches; spread, 14 to 15 inches). Top of head black; a black stripe from base of bill to sides of breast, thus enclosing a broad white patch on side of head; back and wings fuscous-black, barred crosswise with white; underparts dull white, with blackish spots along the sides; the male has a bright red streak (mostly concealed) on each side of the occiput. (Plate 49.)

Range.—The South Atlantic and Gulf States (except in the mountains) north to southeastern Virginia, Tennessee, and southern Missouri. Casual in New Jersey and Pennsylvania.

Distribution in Florida.—A locally common resident in the open pine forests throughout the mainland of Florida. Weston records it as rare in the Pensacola region, but Pennock found it abundant in northern Leon County. It has been reported from Apalachicola, Farmdale, Amelia Island, Lake City, Green Cove Springs, Middleburg, Gainesville, Orlando, Tarpon Springs, Eau Gallie, Auburndale, Miakka Lake, Miami, Royal Palm Hammock, Long Key (southern Everglades), and Cape Sable.

Haunts and Habits.—The Red-cockaded Woodpecker is a lover of open pine forests and is scarcely ever found outside their boundaries. The nests of this species are always located in a living pine, from 20 to 70 feet above the ground. The eggs, numbering usually 3 or 4, are laid late in April or early in May (Seven Oaks, April 26, 1905; Largo, May 1, 1905; San Mateo, May 9, 1891). Wayne (1910, p. 89) describes the nesting of the birds in South Carolina as follows:

> This bird never lays its eggs until the pine gum pours freely from beneath and around the hole, and in order to accelerate the flow the birds puncture the bark to the "skin" of the tree, thereby causing the gum to exude freely. This species, unlike the Pileated Woodpecker, returns to the same hole year after year until it can no longer make the gum exude. But like the Pileated Woodpecker, it is much attached to the tree in which it has first made its nest, and as long as it can find a suitable spot it will continue to excavate new holes until the tree is killed by this process of boring. I have frequently counted as many

as four holes in one tree, and in two instances I have seen as many as eight. These birds seem to know by instinct when the centre of the tree is rotten, or has what lumbermen call "black-heart," and never make a mistake in selecting a tree. The hole is bored through the solid wood, generally a little upward, to the centre of the tree (which is always rotten), then downward to the depth of from nine inches to a foot or more.

These Woodpeckers are not wild, but will allow a person to approach them rather closely. They are active in their search for insects, and as they climb about the trunk and limbs of the pines, they utter a rather shrill, querulous *churr*. At times they indulge in an animated "conversation," when their chattering somewhat resembles the notes of the Brown-headed Nuthatch.

Food.—This Woodpecker does not frequent orchards or cultivated lands, and its destruction of insects in the pine forests places it in the class of beneficial species. The insects most frequently eaten are ants, larvae of wood-boring beetles, grasshoppers, crickets, and caterpillars. The vegetable food consists of mast—chiefly pine seeds—and seeds of magnolia, bayberry, and poison ivy. (Beal, McAtee, and Kalmbach, 1916, p. 34.)

IVORY-BILLED WOODPECKER: *Campéphilus principâlis* (Linnaeus)

Recognition Marks.—The largest of the North American woodpeckers (length, 19 to 21 inches; spread, 30 to 33 inches; bill, 2.5 inches); bill stout, chisel-like, light horn color. Plumage glossy blue-black, glossed with green below; head crested, red in the male, black in the female; a white stripe extends down each side of the neck on to the fore back; *wings with large white patches.* (Plate 46.)

Range.—Formerly the South Atlantic and Gulf States from eastern Texas to North Carolina, and north in the Mississippi Valley to Missouri, southern Illinois, and southern Indiana; now nearly exterminated except in a few localities in Florida; possibly still exists in parts of Texas, Louisiana, and Mississippi.

Distribution in Florida.—Formerly resident in suitable situations over the greater part of the State except on the Florida Keys;[1] now nearing extinction and found in very small numbers in a few remote sections. As long ago as 1887, Scott (1888b, p. 186) speaks of this species as comparatively rare, although in March of that year he observed 11 individuals in a swamp near Tarpon Springs. In April, 1893, Wayne (1893, p. 338) collected 13 specimens and saw about 10 more in the vicinity of Old Town, but in 1895, he wrote of the Wacissa region:

> This magnificent bird was once very common in this region—a country especially adapted to its wants—where it was in a large measure secure, but it is now rapidly becoming extinct on the Wacissa. Every one is shot by being systematically followed up. They are shot for food, and the people—the crackers—consider them "better than ducks!" The bill is also prized and many fall victims for that reason.

C. J. Pennock, who lived for several years at St. Marks, had some difficulty in obtaining a single specimen (May 30, 1917) from the Aucilla River. In 1920, and again in 1926, I explored a considerable area of heavy swamp and hammock country on the Aucilla and Wacissa Rivers in an intensive search for this Woodpecker without seeing or hearing a single one. A resident of the region, who spends most of his time in the forest,

[1] The record published by Bartsch (1919, p. 499) from the Tortugas is apparently based on an error of a copyist; the original entry in the museum catalogue is without locality.

stated that the last individuals he had seen in the Wacissa swamps were two young birds, about 1923. The big swamps along the Apalachicola River harbored a few of the birds as late as 1920, according to the reports of two men residing at Apalachicola. B. H. Kinser, while hunting Turkeys in the Oklawaha Swamp in the fall of 1923, saw several Ivory-bills. W. H. Mann, of St. Cloud, saw four birds on Taylor Creek, Osceola County, in 1923, and in the spring of 1924 Arthur A. Allen went into this region and was fortunate in observing and photographing a pair of the birds (A. A. Allen, 1924, p. 211). Several birds were seen there in the fall of 1924, and two or more specimens taken by hunters, but the following spring (May, 1925) I searched the swamps along Taylor Creek without finding any Ivory-bills. Not far from there, near Lake Poinsett, D. J. Nicholson observed a pair of Ivory-bills, February 23, 1924, and obtained authentic reports of a few others that had recently been seen in northern Osceola and southern Orange Counties. Mrs. F. W. Sams reported seeing two birds in 1907 and one in 1911, in Turnbull Swamp, near New Smyrna.

The "Big Cypress" country in Collier County was reputed in former years to be a favorite resort for the Ivory-bill, but there, as in other sections, the birds have now become very rare. In February, 1898, Robert Ridgway spent two months in that region, and was able to obtain only two specimens and to find two nests (Ridgway, 1898, p. 35), and in the spring of 1914, F. H. Kennard (1915a, p. 10) made a long journey through the "Big Cypress" and obtained but a single specimen of this bird. The most southerly records are from Naples, where a specimen was taken in April, 1902, by W. S. Dickinson, and from the Royal Palm Hammock, where a pair was reported with young in May, 1917 (Howell, 1921, p. 257).

Haunts and Habits.—These splendid birds are now absolutely protected by the laws of Florida, but it is very doubtful whether the remnant can be saved from extinction. They haunt the deep cypress swamps, nesting and roosting usually in cavities dug by themselves high up in a tall cypress in the midst of the swamp. Occasionally they choose a pine standing near the border of a swamp, or a palmetto, a bay, or a gum in a hammock. The entrance hole is usually oval in shape, 30 to 50 feet from the ground, and the nest cavity is from 14 inches to 3 feet in depth. A living tree is usually chosen, sometimes a dead one, but the nest is never dug in rotten wood. The eggs are usually 3 or 4 in number, rarely 5. Nesting may begin as early as the latter part of January and continues until April. Scott (1888b, p. 186) records a young bird about one-third grown found in a nest at Tarpon Springs, March 17, 1887, and mentions (1881, p. 16) an incubating female taken at the mouth of the Withlacoochee River, January 20, 1880. Ridgway (1898, p. 35) found two pairs nesting in the Big Cypress region, February 15, 1898, but did not examine the nests. Incubated eggs were taken by R. D. Hoyt in Lafayette County, April 19, 1893.

The Ivory-bills feed largely in the open pine forests or in the palmetto hammocks near the swamps, and are said to be found frequently about burned tracts. Audubon describes their flight as follows (1831, vol. 1, p. 343):

> The flight of this bird is graceful in the extreme although seldom prolonged to more than a few hundred yards at a time, unless when it has to cross a large river, which it does in deep undulations, opening its wings at first to their full extent, and nearly closing them to renew the propelling impulse. The

transit from one tree to another, even should the distance be as much as a hundred yards, is performed in a single sweep, and the bird appears as if merely swinging itself from the top of the one tree to that of the other, forming an elegantly curved line.

Of its voice, Ridgway (1898, p. 36) says:

The Ivory-bill . . . is comparatively quiet and secluded, and its notes would not attract attention except from one keenly alert for new sounds, being notable for their nasal tone and perfect monotony rather than any other quality. In fact, so far as my own experience indicates, the notes of the Ivory-bill are not as loud as those of the Red-bellied Woodpecker, as I was convinced by hearing them both at the same time. They resemble nothing else so much as the toot of a child's penny trumpet, as described by Wilson, or a false high note on a clarionet, as Audubon describes it, repeated three or more times (like pait, pait, pait), with absolute monotony; but instead of being audible at a distance of half a mile, as Audubon states, I am sure that those heard by me would have been inaudible beyond half that distance.

S. C. Graham (1909, p. 892), describing the actions of a pair seen feeding on a decaying pine tree, says: "All the while they were incessantly talking to each other, 'Pee-peep-peah, peep,' the sounds resembling the burry reed notes of a Scotch bagpipe. The birds descended the tree as they fed, inching down, with the sharp spine feathers of their tail sticking into the bark."

Food.—Comparatively little is known of the food habits of this vanishing species, but there can be no doubt that it was valuable as a conservator of the forests. Like most other woodpeckers, they procure most of their living from dead or dying trees. Audubon states that they eat, in addition to insects, wild grapes, persimmons, and hackberries. Two stomachs examined from Texas contained wood-boring larvae, engraver beetles, pecan nuts, and the fruit of the big magnolia. McIlhenny says (Bendire, 1895, p. 44) that in Louisiana the Ivory-bill feeds to some extent on the mast of the live oak and stores acorns in holes for its winter supply.

TYRANT FLYCATCHERS: Family Tyrannidae

KINGBIRD: *Tyrannus tyrannus* (Linnaeus)

Other Names: **Bee Martin; Bee Bird**

Recognition Marks.—Length, 8 to 8.5 inches; spread, 14 to 15 inches; upperparts dark neutral gray, becoming nearly black on head and tail; a concealed patch of orange-red on crown; tail slightly rounded, *white tipped;* underparts white. (Plate 47.)

Range.—Breeds from southern British Columbia, southern Mackenzie, northern Ontario, central Quebec, and Newfoundland south to central Oregon, northern New Mexico, central Texas, and the Gulf States. Winters from southern Mexico to Colombia, Peru, and Bolivia. Casual in Cuba in migration.

Distribution in Florida.—Resident in summer throughout the peninsula. Breeding specimens have been examined from Royal Palm Hammock, Goulds, Fort Lauderdale, Punta Gorda, Tarpon Springs, Citrus Center, Kenansville, Southport, Osceola County, Lake Kissimmee, St. Marks, Whitfield, and Pensacola.[1]

[1]The difference in size of bill claimed for a Florida race, *Tyrannus t. vexator* (Bangs, 1898, p. 178), proves to be too slight for recognition; measurements of 16 breeding specimens from central and southern Florida are as follows: Length of bill, males, 17.2 mm. (17–18); females, 17.2 (17–18); width of bill at base, males, 10 mm. (9–11); females, 9.5 (9–10). Measurements of 30 specimens from the middle Atlantic States: Length of bill, males, 16.4 mm. (15–17); females, 15.5 (14.5–17); width of bill at base, males, 9.8 mm. (9–10); females, 9.6 (9–10).

Migrants from the South arrive during March; first arrivals were reported on the Tortugas, March 16, 1923; Fakahatchee River (Collier County), March 12, 1919; Bassenger, March 14, 1907; Kissimmee, March 20, 1902; Orlando and Micanopy, March 1, 1909 (independent observers); Titusville, March 21, 1905; Lake Iamonia, March 24, 1926; De Funiak Springs, March 21, 1909; and Pensacola, March 21, 1921. Scott (1890e, p. 311) reported migrant Kingbirds abundant on the Tortugas throughout April to May 2, 1890, and Bartsch observed them there May 2 to 4, 1913.

In fall migration, the first was noted on the Tortugas, August 15, 1925, and others on August 18, 19, and 24. At Key West, Atkins (Scott, 1889a, p. 318) recorded their appearance in large flocks on August 30, and they remained common until October 15. The last birds observed in fall were noted at Pensacola, October 6, 1929; St. Marks, October 4, 1918; Daytona Beach, September 28, 1910; Orlando, October 12, 1911; and St. Lucie, October 21, 1918.

HAUNTS AND HABITS.—In Florida, Kingbirds are found in open pine forests, on cultivated lands, about ponds and sloughs on the prairies, and on the brushy borders of lakes, rivers, and marshes. In the St. Johns River marshes above Lake Washington, we found them living in bushes over the water and around the clumps of lily pads in the river. The nests are frequently placed in bushes or trees overhanging water, 3 to 10 feet above the ground. Weston says that in the region around Pensacola the birds regularly place their nests among the needles of the long-leaf pine, at the outer ends of horizontal branches, where they are entirely inaccessible. The eggs, numbering 3 or 4 in a set, are laid about the first of May. Fresh eggs were taken at Seven Oaks, May 5, 1903, and at Orlando, May 7, 1911. Grimes (1931, p. 81) records young just out of a nest near Jacksonville, August 17, 1930.

Kingbirds are rather noisy and restless, and not at all shy. Their common name was given to them because of their habit of driving other birds away from their territory. They are particularly keen to attack hawks, crows, or jays, and lose no opportunity to chase and worry any of these birds that may come into their chosen domain. Most of their food is procured on the wing as the birds make short sallies from some favorite perch on which they sit, surveying the landscape with eyes keen to detect any moving insect.

In the fall migration, the birds often gather into loose flocks numbering several hundred. R. J. Longstreet thus describes a flight observed at Daytona Beach, August 26, 1923:

> After a heavy rain and windstorm at noon, with a light rain still falling, thousands of Kingbirds were seen, all flying south at a considerable altitude. At first I was unable to identify them, but many stopped to hover inquiringly over a group of poke-berry bushes, a few alighting. It was these that I identified. I observed the flight for at least ten minutes before the birds were gone.

H. L. Stoddard noted a large gathering of Kingbirds at Lake Jackson on September 3, 1926, associating with Grackles and Redwings in a roost on a wooded island in the lake. At 7 p.m. on that date he estimated that 2,000 Kingbirds had gathered, all leaving nearly together to enter the roost with the other birds. E. J. Brown saw a large flight of migrating Kingbirds at Coconut Grove from August 27 to 31, 1929; hundreds passed on each of these days, many stopping to feed on the fruits of the wild fig and Virginia creeper.

FOOD.—The food of the Kingbird consists principally of insects, including beetles, boll weevils, grasshoppers, butterflies, bees, wasps, flies, mosquitoes, and caterpillars. In the examination of more than 600 stomachs, Beal (1912, pp. 11–19) found only 61 bees in 22 stomachs, thus indicating that the habit of visiting bee hives is by no means common. Wild fruits and berries are eaten in small quantities, including wild cherries, elderberries, mulberries, blackberries, huckleberries, pokeberries, bayberries, frost grapes, and the fruit of the sassafras, dogwood, Virginia creeper, buckthorn, and red cedar.

GRAY KINGBIRD: *Tyránnus dominicénsis dominicénsis* (Gmelin)

OTHER NAME: **Pipiry Flycatcher**

RECOGNITION MARKS.—Larger than the common Kingbird (length, 8 to 9 inches; spread, 14 to 16 inches); *bill very large;* upperparts neutral gray, with a concealed orange patch on crown; underparts white; wings and tail hair brown (dark drab), or fuscous; lining of wings tinged with pale yellow; no white on tail. (Plate 47.)

RANGE.—Breeds in the coast region of Florida and of South Carolina (rarely); also in the Bahamas, West Indies, Yucatan, and northern South America. Winters from Jamaica and Haiti southward.

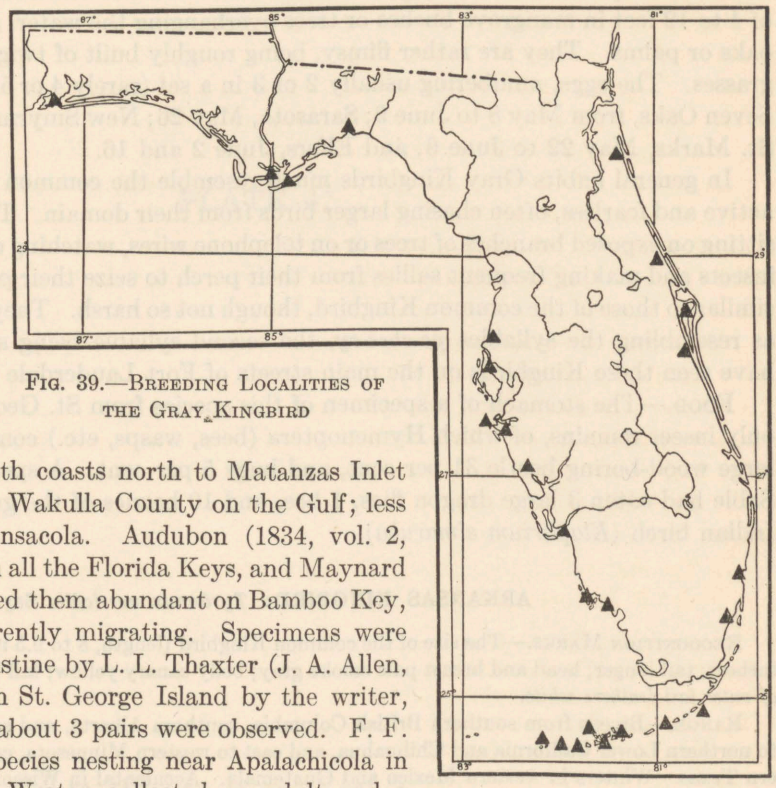

FIG. 39.—BREEDING LOCALITIES OF THE GRAY KINGBIRD

DISTRIBUTION IN FLORIDA. — An abundant summer resident on the Florida Keys and on both coasts north to Matanzas Inlet on the east side and Wakulla County on the Gulf; less common west to Pensacola. Audubon (1834, vol. 2, p. 392) found them on all the Florida Keys, and Maynard (1881, p. 176) recorded them abundant on Bamboo Key, about May 1, apparently migrating. Specimens were obtained at St. Augustine by L. L. Thaxter (J. A. Allen, 1871, p. 300), and on St. George Island by the writer, May 9, 1926, where about 3 pairs were observed. F. F. Gander noted the species nesting near Apalachicola in June, 1928. F. M. Weston collected an adult and a young specimen and saw several other birds at Pensacola, August 7, 1927, and in 1928 he observed two pairs, each of which raised a brood of young. On Santa Rosa Island, July 4, 1931, he observed six pairs within a few miles.

The earliest record of spring migration is that of a specimen taken on the Tortugas, March 16, 1923. Scott (1890e, p. 311) collected two there March 23, 1890, but observed

no others until during the last of April and the first week of May, at which time they became common. Bartsch noted migrants there from May 14 to 20, 1922. Fowler (1906, p. 399) recorded the birds present in June on Marquesas, Boca Grande, Boca Chica, Sugar Loaf, Big Pine, Grassy, and Snipe Keys. Atkins (Scott, 1889a, p. 318) mentions them as breeding at Key West, arriving about April 11. The first migrants were reported at Fort Lauderdale, March 25, 1918; Chokoloskee, April 5, 1928; Palma Sola, April 7, 1913; New Smyrna, April 3, 1924; St. Marks, April 14, 1919; and Pensacola, May 7, 1916. A single bird that I observed in the Everglades, about 25 miles south of Lake Okeechobee, April 17, 1923, was probably a migrant. The last seen in autumn were noted at St. Marks, September 26, 1917, and at New Smyrna, September 18, 1924. Dr. H. C. Burgess saw one at Royal Palm Hammock, December 26 to 28, 1917, which occurrence seems to indicate that a few pass the winter in extreme southern Florida.

HAUNTS AND HABITS.—The Gray Kingbird is strictly confined to the shores of the salt-water bays and inlets along the coast. The nests are commonly placed at a height of 4 to 12 feet in mangrove bushes or trees overhanging the water, and less frequently in oaks or palms. They are rather flimsy, being roughly built of twigs and stems of marsh grasses. The eggs, numbering usually 2 or 3 in a set (rarely 4 or 5), have been taken at Seven Oaks, from May 8 to June 9; Sarasota, May 26; New Smyrna, May 24 to July 18; St. Marks, May 22 to June 6; and Elfers, June 2 and 16.

In general habits Gray Kingbirds much resemble the common Kingbird. They are active and fearless, often chasing larger birds from their domain. They spend much time sitting on exposed branches of trees or on telephone wires, watching constantly for passing insects and making frequent sallies from their perch to seize their prey. Their notes are similar to those of the common Kingbird, though not so harsh. They have been described as resembling the syllables *pe-cheé-ry*, the second syllable being strongly accented. I have seen these Kingbirds on the main streets of Fort Lauderdale and Miami.

FOOD.—The stomach of a specimen of this species from St. George Island contained only insect remains, of which Hymenoptera (bees, wasps, etc.) composed 61 per cent, a large wood-boring beetle 31 per cent, and bugs 5 per cent. A specimen taken at Cape Sable had eaten 3 large dragon flies, 1 bee, and 10 berries of the gumbo limbo, or West Indian birch (*Elaphrium simaruba*).

ARKANSAS KINGBIRD: *Tyrânnus verticâlis* Say

RECOGNITION MARKS.—The size of the common Kingbird (length, 8 to 9.5 inches; spread, 15 to 16.5 inches); tail longer; head and breast pale smoke gray; belly canary yellow; tail black, with the *outer web of outer tail feathers white.*

RANGE.—Breeds from southern British Columbia, southern Alberta, and southern Manitoba south to northern Lower California and Chihuahua, and east to western Minnesota, central Kansas, and western Texas. Winters in western Mexico and Guatemala. Accidental in Wisconsin, Maine, New York, New Jersey, Maryland, and Florida.

DISTRIBUTION IN FLORIDA.—Apparently rather frequent as a straggler. Known from the following records: Cape Sable, February 18, 1918, specimen taken by the writer; Miami Beach, December 2, 1922, two specimens taken by W. W. Worthington (Brodkorb, 1931, p. 270); Daytona Beach, November 2, 1923, one seen (Ainsworth and Longstreet,

PLATE 47

EXPLANATION OF PLATE 47

FLYCATCHERS

The figure at the upper right is a Phoebe; below it in the center is an Acadian Flycatcher and at the upper left a Wood Pewee; in the center, from left to right, a Kingbird and a Gray Kingbird; below, at the right, a Crested Flycatcher.

F. B. Jaques

1924, p. 9); St. Marks, October 11, 1919, two specimens taken (Pennock, 1920a, p. 143); Pensacola, October 17, 1920, and September 27 and November 17 to 28, 1925, three individuals seen by Francis M. Weston; and Key West, January 18, 1919, two seen by Paul Bartsch.

HAUNTS AND HABITS.—The Arkansas Kingbird is a bird of the prairies and the open country generally, having habits similar to those of the common Kingbird. Mrs. Bailey (1902, p. 249) describes the bird as "a masterful, positive character, . . . always screaming and scrimmaging. . . . When perched he is on the lookout for insects, and dashes out for one to soar back on outspread wings and tail, shrieking triumphantly as he comes."

The bird that I observed at Cape Sable was first seen on February 8 in a clump of bushes on the coastal prairie; on February 18 it was again seen in the same place and collected.

SCISSOR-TAILED FLYCATCHER: *Muscivora forficâta* (Gmelin)

OTHER NAME: Swallow-tailed Flycatcher

RECOGNITION MARKS.—About the size of the Kingbird (length, 11.5 to 15 inches; spread, 14 to 15.5 inches; tail, 6.5 to 12 inches), but with *very long, deeply forked tail.* Head and shoulders pale gull gray; back washed with pinkish vinaceous; underparts white, the sides of body and lining of wings deep salmon color.

RANGE.—Breeds from southern Nebraska to southern Texas, and casually to southwestern Missouri, western Arkansas, and western Louisiana. Winters from southern Mexico to Panama. Accidental north to Colorado and New Brunswick and south to Florida.

DISTRIBUTION IN FLORIDA.—Of casual but rather frequent occurrence in southern Florida and on the Keys; accidental in northern Florida. The records are as follows: Key West, specimen, January 15, 1885 (Ridgway, 1886a, p. 134); Key West, five seen, two taken, by J. W. Atkins, December 10, 1888 (Scott, 1889a, p. 161); Key West, three seen, January 18, 1919, by Paul Bartsch; Key West, four seen by D. J. Nicholson, November 18, 1930 (these last were reported by a local resident to have been seen about six weeks prior to the date mentioned); Cape Sable, specimen taken, March 2, 1885 (Goss, 1886, p. 134); Cape Sable, one seen by the writer, February 11, 1918; Miami, specimen taken by A. Lechevallier (Scott, 1889a, p. 318); Tamiami Trail, near Miami, specimen taken, November 29, 1922 (H. H. Bailey, 1925a, p. 88); Fulford, specimen taken, December 14, 1924 (Bailey, l.c.); Sumner, one seen by A. B. Cannon, November 2, 1921; and Whitfield, one seen by Worthington, May 15, 1903 (Worthington and Todd, 1926, p. 214).

HAUNTS AND HABITS.—The Scissor-tail is a bird of the prairies and open, cultivated lands, where scattered trees or telephone wires furnish convenient perches. The birds rarely alight on the ground, but procure most of their food on the wing. Their ordinary flight is straightforward and rather moderate, but they frequently indulge in astonishing aerial gyrations. Concerning this bird Mrs. Bailey (1902, p. 247) says:

> One of his favorite performances is to fly up and, with rattling wings, execute an aerial seesaw, a line of sharp-angled VVVVVVV's, helping himself at the short turns by rapidly opening and shutting his long white scissors. As he goes up and down he utters all the while a penetrating scream *ka-quee-ka-quee-ka-quee-ka-quee-ka-quee*, the emphasis being given each time at the top of the ascending line.

Food.—A study of the food of this Flycatcher by Beal (1912, pp. 8–11) showed the bird to be highly beneficial, as it feeds almost wholly upon insects, with a small amount (3.88 per cent) of small fruits and seeds. Grasshoppers and crickets evidently constitute the favorite food, for of the 129 stomachs examined, 88 contained grasshoppers or crickets and 8 held no other food. Other insects frequently eaten are beetles, bugs, and caterpillars, including the cotton-leaf worm, the cotton bollworm, and the cotton-boll weevil.

SOUTHERN CRESTED FLYCATCHER: *Myiarchus crinitus crinitus* (Linnaeus)

Other Name: Yellowhammer

Recognition Marks.—Larger than the Kingbird (length, 8.00 to 9.00 inches; spread, 12.75 to 14 inches); upperparts citrine-drab (olive-drab); throat and upper breast pale neutral gray; belly reed yellow (greenish yellow); wings and tail fuscous, edged with cinnamon and showing two buffy wing bars. (Plate 47.)

Range.—Breeds in peninsular Florida, north on the Atlantic coast to southern South Carolina (Howell, 1924, p. 187). Winters in the southern part, and probably also in Central America.

Distribution in Florida.—An abundant summer resident throughout the peninsula; recorded once from Sands Key, off Cape Sable, May 8, 1919, a pair being noted (Bartsch). Winters in smaller numbers in the southern part of the State. Breeding specimens of this race have been examined from St. Marks, Lake Iamonia, Amelia Island, Kenansville, Seven Oaks, Anclote Key, Pass-a-Grille, Braden River, Charlotte Harbor, Miakka Lake, La Belle, Deep Lake, Caxambas, and Royal Palm Hammock. Three specimens from Amelia Island (April 27 and 30, 1923) are intermediate, approaching *boreus* in color and size of bill, but best referred to *crinitus*.

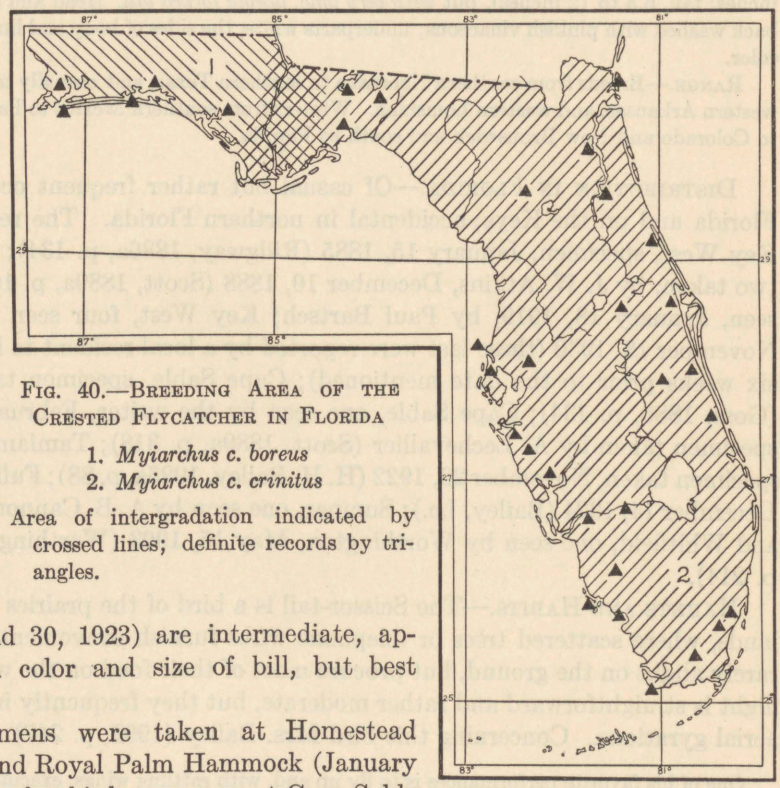

Fig. 40.—Breeding Area of the Crested Flycatcher in Florida

1. *Myiarchus c. boreus*
2. *Myiarchus c. crinitus*

Area of intergradation indicated by crossed lines; definite records by triangles.

Wintering specimens were taken at Homestead (January 15, 1918) and Royal Palm Hammock (January 18 to 24, 1918), and a few birds were seen at Cape Sable (February 11, 1918). Maynard (1881, p. 171) says that these Flycatchers spend the entire winter on the Florida Keys. Atkins (Scott, 1889a, p. 319) took one specimen at Key West,

January 24, 1889. One bird was seen at Tavernier, January 16, 1926, by M. S. Crosby, and one on Upper Matecumbe, February 4, 1910, by Mrs. Brodhead. Other winter records are as follows: Miami, February 7, 1901 (common, Torrey, 1904, p. 108); Fort Lauderdale, February 5, 1918 (Mrs. Byrd); La Belle, January 5, 1926 (Crosby); Lake Okeechobee, January, 1912 (Nicholson); Sanibel Island, February 25, 1924 (Miss Mitchell); and New Smyrna, February 14, 1922 (two, S. R. Ingersoll). Scott (1889a, p. 319) records the birds common in winter at Punta Rassa.

First arrivals in spring migration were reported at Bassenger, March 8, 1907; Punta Gorda, March 14, 1921; Palma Sola, March 19, 1909; Orlando, March 20, 1928; lower Suwannee River, March 23, 1890; Micanopy, March 15, 1909; Gainesville, March 31, 1887; Lake Iamonia, March 31, 1926; and New Smyrna, March 25, 1907.

HAUNTS AND HABITS.—The Crested Flycatchers in Florida inhabit a variety of situations—open pine forests, cypress swamps, hammocks of oak or cabbage palmetto, the custard apple forest on the shores of Lake Okeechobee, and the black mangrove swamps near Cape Sable. Their nests are placed usually in hollow trees or stubs, 6 to 40 feet above the ground, occasionally in bird boxes or in deserted houses or outbuildings. A nest found by Doctor Ralph at San Mateo was "composed of dry cypress leaves, pine needles, grasses, sphagnum moss, dead leaves, bunches of hair, snake exuviae, strips of cypress bark, weeds, grass roots, palmetto fiber, and feathers" (Bendire, 1895, p. 261). Nicholson has found several nests composed mainly of feathers, and others of feathers and hair, but always containing pieces of cast-off snake skin, which latter material appears to be almost invariably used by these birds. The eggs usually number from 4 to 6. Fresh sets were found at Cape Sable, March 14, 1927; Chokoloskee Bay, April 7, 1903; Orlando, May 2, 1915, and May 20, 1918; Gainesville, May 8, 1900; Seven Oaks, June 1, 1905; Pensacola, May 11, 1924; and Daytona Beach, June 11, 1908.

These Flycatchers are rather solitary in habit and they resent the presence of other species near their nests, but they do not chase hawks or crows as the Kingbirds do. Their usual call is a loud, spirited, and rather musical whistle, given with a rising inflection, in addition to which they have a variety of characteristic notes. Their food is procured in the usual manner of the flycatchers, the bird sitting on some favorite perch or a dead limb well up in a tree in the woods, from which it sallies forth to capture some flying insect, the sharp snapping of the mandibles indicating a successful effort.

FOOD.—This species is mainly beneficial in its food habits, consuming principally insects, with small quantities of wild fruit. In 265 stomachs examined in the Biological Survey, animal matter formed 93.7 per cent of the total contents, and vegetable matter, 6.3 per cent. Among the insects eaten were beetles, weevils, sawflies, horseflies, stink bugs, cicadas, leaf hoppers, grasshoppers, crickets, katydids, caterpillars, and moths. The vegetable food consisted of wild fruit, such as mulberries, pokeberries, blackberries, huckleberries, elderberries, chokecherries, grapes, and the fruit of the sassafras, Virginia creeper, and dogwood (Beal, 1912, pp. 24–27).

NORTHERN CRESTED FLYCATCHER: *Myiárchus crinítus bóreus* Bangs

RECOGNITION MARKS.—Similar to the southern race, but bill smaller and upperparts averaging more brownish (less greenish).

RANGE.—Breeds from southern Manitoba, central Ontario, southern Quebec, and New Brunswick south to southern Texas and the Gulf coast. Winters from eastern and southern Mexico to Panama and Colombia.

DISTRIBUTION IN FLORIDA.—Breeds in the northwestern part and probably migrates throughout the peninsula. Breeding specimens have been examined from Destin (Okaloosa County), Whitfield, and Pensacola. Specimens of this race from New Smyrna, April 2, 1877, and Tarpon Springs, April 17, 1890, were probably belated migrants. The earliest arrivals in spring were noted at Warrington, March 28, 1885; De Funiak Springs, March 27, 1908; and Tallahassee, March 30, 1902. The last observed in fall were reported at Tallahassee, September 13, 1904, and at Pensacola, September 22, 1918. Fresh eggs were found at Pensacola, May 11, 1924.

EASTERN PHOEBE: *Sayórnis phoébe* (Latham)

OTHER NAMES: **Bridge Pewee; Tick Bird**

RECOGNITION MARKS.—Slightly larger than the Wood Pewee (length, 6.5 to 7 inches; spread, 10.5 to 11.25 inches); top of head clove brown (dark olive-brown), back grayish olive-brown; *bill blackish* above and below; wings without conspicuous bars; underparts yellowish white or pale yellow; sides washed with grayish olive. Distinguished from the Wood Pewee by its habit of flirting its tail on alighting. (Plate 47.)

RANGE.—Breeds from western Mackenzie, Ontario, Quebec, New Brunswick, and Nova Scotia south to central Texas, northern Mississippi, northern Alabama, and northern Georgia. Winters in southeastern United States (south of latitude 37°) and south to southern Mexico.

DISTRIBUTION IN FLORIDA.—A common winter resident throughout the State. Reported common on Upper Matecumbe Key and Key West, and recorded from Indian Key and the Tortugas (one record, 1864). Migrants in fall appear in Florida about the last of September, the first having been noted at Chipley, September 28, 1903; Pensacola, September 30, 1923; St. Marks, October 1, 1917; Orlando, September 28, 1910; Palma Sola, October 1, 1912; Princeton, October 7, 1916; and Sombrero Key, October 27, 1886. An unusually early arrival was reported at De Funiak Springs, September 6, 1909. The last seen in spring were noted 10 miles north of Flamingo, March 26, 1926; Everglade, March 21, 1919; Sanibel Island, March 22, 1924; Orlando, March 26, 1909, and April 7, 1911; Gainesville, April 4, 1887; Daytona Beach, April 17, 1925; and Pensacola, March 28, 1924.

HAUNTS AND HABITS.—During their stay in the South, Phoebes are found in cultivated lands, in shrubbery along streams, ponds, and sloughs, and on the borders of timbered swamps. They are said to alight on the backs of cattle and to catch insects that may be attracted by the animals. The birds are expert flycatchers, spending much time on some low perch, such as a weed stalk, fence post, or a branch of a tree overhanging water, scanning the surroundings keenly, and making frequent sallies for some passing insect. Immediately on alighting and frequently when sitting on a perch the birds lower and raise their tail with a characteristic flirt. They are quiet and unassuming birds, and during the winter season their only note is a soft, metallic *tschip*.

FOOD.—The food of the Phoebe, as studied by Professor Beal (1912, pp. 30–35), consists of animal matter, 89.23 per cent, and vegetable matter, 10.77 per cent. The

animal food is composed of spiders, ticks, millipeds, and a large variety of insects, including ants, flies, mosquitoes, stink bugs, leaf hoppers, click beetles, May beetles, boll weevils, grasshoppers, crickets, moths, and caterpillars. The vegetable food includes a large number of fruits and seeds, such as the berries of juniper, greenbrier, wax myrtle, hackberry, pokeweed, sassafras, wild cherry, sumac, poison ivy, poison sumac, holly, Virginia creeper, dogwood, and elder.

YELLOW-BELLIED FLYCATCHER: *Empidonax flaviventris* (Baird)

RECOGNITION MARKS.—About the size of the Wood Pewee (length, 5 to 5.75 inches; spread, 8 to 8.5 inches), with shorter tail. Upperparts yellowish olive; *a conspicuous yellow eye-ring;* two conspicuous pale yellowish wing bars; throat and breast yellowish olive; belly primrose yellow; the only small eastern flycatcher with *entire* underparts yellow.

RANGE.—Breeds from northern Alberta, Manitoba, Quebec, and Newfoundland south to North Dakota, northern Minnesota, northern Michigan, northern New York, northern Vermont, southern New Hampshire, and the mountains of Pennsylvania. Winters from southern Mexico to Panama.

DISTRIBUTION IN FLORIDA.—A very rare migrant; known from two records, as follows: Tallahassee, October 11, 1901, specimen taken by R. W. Williams (1904, p. 457); St. Marks, May 2, 1919, one seen near the coast by C. J. Pennock and T. S. Palmer (Pennock, 1920a, p. 48).

HAUNTS AND HABITS.—In its northern home this Flycatcher inhabits tamarack swamps and heavy coniferous forests, living mainly in the dense undergrowth. The notes of this species are weak, and the birds are of very retiring disposition, and thus difficult to observe.

ACADIAN FLYCATCHER: *Empidonax virescens* (Vieillot)

OTHER NAME: **Green-crested Flycatcher**

RECOGNITION MARKS.—About the size of the Yellow-bellied Flycatcher (length, 5.5 to 6.25 inches; spread, 9 to 9.5 inches); bill usually larger; upperparts slightly paler (light yellowish olive); underparts white, washed with pale yellow on lower abdomen, and breast with an indistinct grayish or yellowish band; *wing bars pinkish buff* or buffy white. (Plate 47.)

RANGE.—Breeds from northeastern Nebraska, central Iowa, Michigan, southern Ontario, New York, and Connecticut south to southern Texas and the Gulf States. Winters in Colombia and Ecuador. Accidental in the Bahamas and Cuba in migration.

DISTRIBUTION IN FLORIDA.—A moderately common migrant and summer resident in northern and central Florida, as far south at least as Osceola County; recorded from the Tortugas in migration. Few notes are available on its migrations, so the dates of arrival and departure are not accurately known. First arrivals were noted at Gainesville, April 20, 1887; Old Town, April 11, 1893; St. Marks, April 10, 1918; Whitfield, April 6, 1903; Pensacola, April 25, 1926; and Amelia Island, April 26, 1916. The species was seen by Bartsch on the Tortugas, August 19 and 22, 1925, indicating an early fall migration. It was recorded at Punta Rassa, September 13, 1886 (Scott, 1889a, p. 319), and at Tallahassee, October 9, 1904.

Late in April and early in May, 1925, I observed the birds, apparently settled for the summer, at Taylor Creek, Lake Gentry, and Illahaw, Osceola County, and quite possibly

they breed still farther south in that region, although we failed to find any around Istokpoga Lake in May, 1923. They were found in June, 1925, at Silver Spring, Old Town, Orange Park, Yulee, and Boulogne, and in May, 1926, were common in the big swamps on the Apalachicola and Aucilla Rivers. Weston reported the species as a rare summer resident in Escambia County; and Stoddard and Grange noted one bird at Lake Miccosukee, June 20, 1926. Late in May, 1929, we found the birds at Brooksville, Panasoffkee Lake, Tacoma, Genoa, and Lake Cherry.

HAUNTS AND HABITS.—The Acadian Flycatcher lives in heavily timbered river bottoms and in cypress swamps. The birds occupy the lower branches of the trees, and suspend their frail, shallow nests from the forks of a horizontal limb, 4 to 20 feet above the ground. The eggs, 2 to 4 in number, may usually be seen through the nest from beneath. A nest found by Chapman (1888a, p. 272) at Gainesville, May 9, 1887, was constructed almost entirely of Spanish moss, and contained, on May 27, two eggs with half-formed embryos. Stoddard discovered a nest in Thomas County, Georgia, close to the Florida line, located about 15 feet up on a drooping limb of a small gum tree; it was composed entirely of Spanish moss and lined with the black inner parts of the same plant. Grimes (1931, p. 81) describes a nest with two eggs found near Jacksonville, June 5, 1930; this likewise was constructed of Spanish moss.

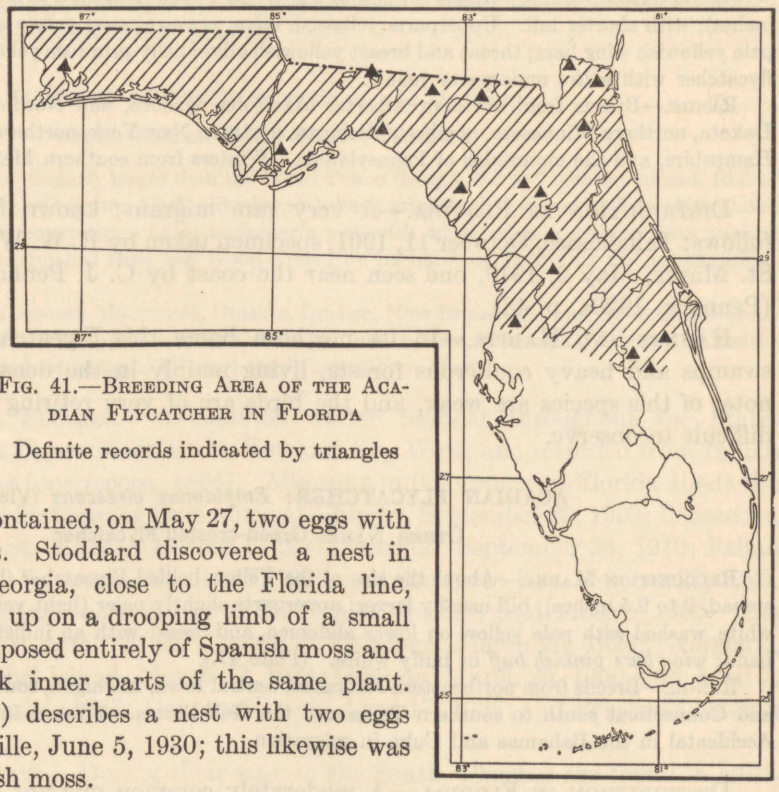

FIG. 41.—BREEDING AREA OF THE ACADIAN FLYCATCHER IN FLORIDA
Definite records indicated by triangles

These birds are rather shy and quiet, but are easily identified by their abrupt note, *qu-reép*, the two syllables closely connected and the last strongly accented. Frequently, as the birds fly from perch to perch, they flutter their wings rapidly and utter a series of soft, twittering notes.

FOOD.—A study of the food of this bird in the Biological Survey (Beal, 1912, pp. 58–60) showed that its food consists almost entirely of insects. In the stomachs examined, the animal portion constituted 97 per cent of the whole; of this only about 3 per cent was made up of spiders and millipeds, the remainder being insects. Wasps, bees, and ants were the most important items, furnishing 40 per cent of the bird's food. Moths and caterpillars were next in importance and amounted to nearly 19 per cent. Beetles are

eaten frequently, and grasshoppers and crickets occasionally. A small amount of wild fruit is consumed.

ALDER FLYCATCHER: *Empidonax trâilli trâilli* (Audubon)

OTHER NAME: Traill's Flycatcher

RECOGNITION MARKS.—About the size of the Acadian Flycatcher (length, 5.25 to 6 inches; spread, 7.5 to 9 inches); back much more brownish (light brownish olive); underparts very similar; *wing bars whitish.*

RANGE.—Breeds from central Alaska, northwestern Mackenzie, central Quebec, and Newfoundland south to east central British Columbia, eastern Montana, central Arkansas, New York, New Jersey, and the mountains of West Virginia. Winters in Central America south to Panama.

DISTRIBUTION IN FLORIDA.—A very rare spring and autumn migrant. Known from only two records, as follows: A specimen in the collection of Col. John E. Thayer, taken at Kissimmee, May 3, 1893, and a specimen taken at Tallahassee, August 6, 1900, by R. W. Williams (1904, p. 457.)

HAUNTS AND HABITS.—This little Flycatcher is a retiring and inconspicuous member of the fauna, and is easily overlooked in migration. In its summer home, however, where the male calls attention to his presence by his spirited notes, it is more readily located. In the North, it is usually found in alder thickets along small streams or in wet meadows, or in dense hazel thickets on higher ground. In the Middle West (Missouri and Arkansas), it is less retiring and is often found nesting in parks, orchards, and prairie thickets. Although the bird is difficult to distinguish in life from the Least Flycatcher, its notes are characteristic, consisting of a three-syllabled utterance, which has been written *eaze-we-up.*

EASTERN WOOD PEWEE: *Myiochanes virens* (Linnaeus)

RECOGNITION MARKS.—Smaller than the Phoebe (length, 6 to 6.5 inches; spread, 10 to 11 inches); under mandible light horn color; *wings with two whitish bars* (buffy in the young). Upperparts dark olive or grayish olive, the head more brownish; underparts yellowish white clouded on breast with olive-gray. (Plate 47.)

RANGE.—Breeds from Manitoba, Ontario, southern Quebec, and Prince Edward Island south to southern Texas and central Florida, and west to central Nebraska. Winters from Nicaragua to Colombia and Peru. Accidental in migration in Cuba.

DISTRIBUTION IN FLORIDA.—A rather uncommon migrant throughout the State, and a rare summer resident in the northern and central parts; more common in summer in Wakulla and Jefferson Counties. Scott (1889a, p. 319) records it as breeding sparingly about Tarpon Springs, and this is verified by a specimen taken there June 12, 1888. R. D. Hoyt, however, who lived many years at Seven Oaks, never found the birds in the breeding season. We took breeding specimens at Tacoma (May 27, 1929) and Middleburg (June 4, 1929). Other localities in which it has been reported as a breeder are Gainesville (Chapman, 1888a, p. 272); Waukeenah (Wayne, 1895, p. 365); St. Marks (Pennock, 1920a, p. 48); Boulogne (June 23, 1925); Cherry Lake (May 30, 1929); and northern Escambia County (Weston).

A few of these birds may winter in southern Florida, as Christy records 3 or 4 seen in pine woods near Stuart, March 6 to 7, 1927. First migrants in spring were observed

at Palma Sola, March 26, 1909; Orange Springs, March 19 to 22, 1910; Gainesville, April 7, 1887; De Funiak Springs, April 2, 1909; Whitfield, April 4, 1903; and Pensacola, March 24, 1926. The last seen in autumn were noted at Pensacola, October 22, 1925, and November 2, 1929; Tallahassee, October 12, 1904; St. Marks, October 26, 1919; Fort Pierce, November 1, 1918; and Punta Rassa, November 23, 1885. Bartsch reports the Wood Pewee a common migrant on the Tortugas, birds being seen there May 25 to 30, 1916; May 18 to 22, 1922; September 4, 1923; and August 13 to 23, 1925.

HAUNTS AND HABITS.—The Wood Pewee lives in dry upland woods, and often in groves and orchards close to dwelling houses. It is a gentle and confiding bird, with a soft, plaintive, drawling song, *peé-a-wee*, which has given it its common name. This simple little ditty may be heard at all hours of the day, and in the early morning is often elaborated and uttered with much vigor. The birds procure most of their food on the wing, after the usual manner of the flycatchers, and they rarely descend to the ground. The nest is an artistic structure, built of grasses and covered with lichens, and saddled firmly on a horizontal limb of a tree, usually a deciduous one, from 5 to 50 feet above the ground, though ordinarily between 12 and 20 feet. Chapman (1888a, p. 272) mentions a nest found at Gainesville, May 9, 1887, and Baynard says the birds nest early in June in Alachua County. Grimes (1931, p. 81) records two nests with small young in pine trees near Jacksonville, June 1 and 2, 1930.

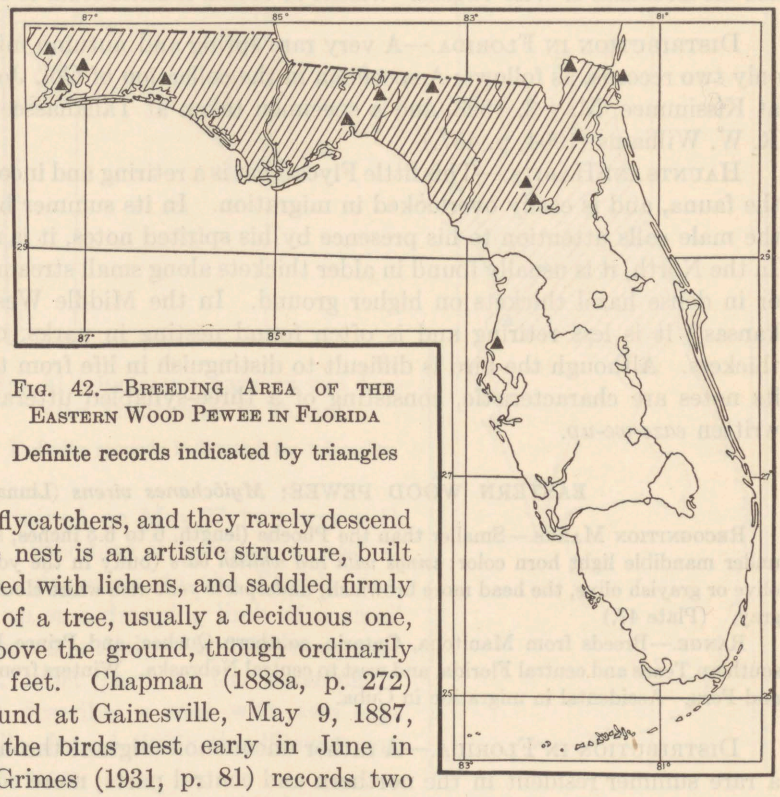

FIG. 42.—BREEDING AREA OF THE EASTERN WOOD PEWEE IN FLORIDA

Definite records indicated by triangles

FOOD.—Examination in the Biological Survey of 359 stomachs of this bird showed that nearly 99 per cent of its food is composed of animal matter, chiefly insects, with a few spiders. Hymenoptera (including ants, bees, wasps, and sawflies) formed more than 25 per cent of the total food, and Diptera (including house flies, horse flies, and other species) about 30 per cent. Moths, caterpillars, grasshoppers, bugs, and beetles made up the remainder of the insect food. The vegetable food consisted of a few kinds of wild berries, including pokeberries, elderberries, blueberries, and berries of the dogwood and poison ivy (Beal, 1912, pp. 44–49).

OLIVE-SIDED FLYCATCHER: *Nuttallórnis mesoleúcus* (Lichtenstein)

RECOGNITION MARKS.—Larger than the Phoebe or the Wood Pewee (length, 7 to 8 inches; spread, 12.5 to 13.5 inches); bill noticeably larger. Upperparts deep grayish olive, the head clove brown (dark olive-brown); wings fuscous, without bars; underparts white or pale yellow, heavily washed on sides with grayish olive (paler than back) or mouse gray, this color meeting on chest.

RANGE.—Breeds from central Alaska, southern Mackenzie, central Quebec, and Cape Breton Island south in coniferous forests of western United States to southern California, Arizona, and western Texas; in northern Michigan, New York, Massachusetts; and in the mountains south to North Carolina. Winters in northern South America from Colombia to Peru.

DISTRIBUTION IN FLORIDA.—A very rare migrant. Known from two records, as follows: Chokoloskee, October 12, 1915, specimen taken by J. B. Ellis (1915, p. 209); Oxford, August 20 and 21, 1917, one bird seen by Mrs. Hiram Byrd.

HAUNTS AND HABITS.—In its summer home, this Flycatcher lives about openings in the forests, where it is commonly seen perched on a dead limb near the top of a tall tree, commanding a good outlook over the surrounding territory. From such a perch it utters frequently its loud and vigorous call consisting of three notes—*put'-pee-wee.*

VERMILION FLYCATCHER: *Pyrocéphalus rubínus mexicánus* Sclater

RECOGNITION MARKS.—Length, about 5.5 inches. *Male:* Head crested; underparts and crest scarlet; back dark drab. *Female:* Upperparts light drab; throat and breast white, with drab streaks; belly washed with buff-pink.

RANGE.—Breeds from southeastern California, southern Nevada, southwestern Utah, western and southern Arizona, southern New Mexico, and southern Texas south to Lower California, Guatemala, Honduras, and Yucatan.

DISTRIBUTION IN FLORIDA.—Accidental; known from only one record—a specimen taken by R. W. Williams (1901, p. 273; 1904, p. 457) at Tallahassee, March 25, 1901.

HAUNTS AND HABITS.—Mrs. Bailey (1928, p. 447) says of this little Flycatcher: "In the nesting season he mounts high above the earth and puffing out his scarlet feathers hovers twittering in midair as if to call all spectators to witness, after which he floats down with inimitable grace."

LARKS: FAMILY ALAUDIDAE

PRAIRIE HORNED LARK: *Otócoris alpéstris praticola* Henshaw

OTHER NAME: Shore Lark

RECOGNITION MARKS.—About the size of the Bluebird (length, 6.5 to 7 inches; spread, 12 to 13 inches); back light drab, faintly streaked with fuscous; occiput, nape, shoulders, rump, and sides vinaceous-fawn; *forehead, patch on side of head, and crescentic patch on breast black; a tuft of black feathers ("horns") over each ear;* throat white or yellowish; line over eye white; tail fuscous-black, *the outer web of outer feathers white.* The birds are nearly always seen on the ground; they *walk,* not hop.

RANGE.—Breeds from southern Manitoba and southern Quebec to eastern Kansas, southern Missouri, Ohio, West Virginia, and Connecticut. Winters south to Texas, Alabama, Georgia, and casually Florida.

DISTRIBUTION IN FLORIDA.—A rare or accidental winter visitant. G. Clyde Fisher (1908, p. 34) reported 30 birds observed at Apalachicola, December 25, 1907; S. V. Wharram recorded 6 seen at Hastings, March 10 and 18, 1919; R. J. Longstreet noted one individual on the golf links at Daytona Beach, November 20 and 21, 1924; and H. H. Bailey (1925a, p. 92) collected a specimen at Miami Beach, February 15, 1921.

HAUNTS AND HABITS.—The Prairie Horned Lark is a bird of the open country and is found during the winter season chiefly in cultivated fields, or sometimes in village or city streets. The birds gather into flocks, feeding on the ground, and as a rule, they are not particularly shy. Their notes, uttered in flight or while feeding, are a soft, lisping *tseep, tseep*, somewhat like the notes of the Pipit, or Titlark.

FOOD.—Nearly four-fifths of the Prairie Horned Lark's food consists of vegetable matter, about half of which is grain, mainly wheat and oats, and the remainder weed seed. Insects constitute about one-fifth of the total food, and include beetles, butterflies, moths, grasshoppers, ants, flies, and wasps. The birds occasionally damage newly sown grain fields, but in the main are considered beneficial in their food habits. (McAtee, 1905, p. 32.)

SWALLOWS: FAMILY HIRUNDINIDAE

BAHAMA SWALLOW: *Callichelidon cyaneoviridis* (Bryant)

RECOGNITION MARKS.—About the size of the Tree Swallow, *but tail much longer and more deeply forked*, the lateral feathers narrow and pointed. *Male:* Head and back dusky olive-green; rump and upper tail coverts metallic green-blue; underparts pure white. Female similar, but head and back paler (elm green).

RANGE.—Bahamas; accidental in Florida.

DISTRIBUTION IN FLORIDA.—Known from two accidental records—a specimen taken on Garden Key, Tortugas, April 7, 1890 (Scott, 1890d, p. 265), and one taken at Tarpon Springs, September 3, 1890 (Brewster, 1897, p. 221). Both these specimens are in the collection of the Museum of Comparative Zoölogy. Scott (1890e, p. 312) mentions seeing another individual on the Tortugas the same day he collected the one referred to above. Maynard (1895, p. 535) observed a flock sailing high in air over Key West, and a single individual on Indian River.

TREE SWALLOW: *Iridoprocne bicolor* (Vieillot)

OTHER NAME: White-bellied Swallow

RECOGNITION MARKS.—About the size of the Barn Swallow (length, 5 to 6 inches; spread, 12 to 13 inches; tail, 2.30 to 2.50 inches); *tail shorter, slightly forked. Male:* Head and upperparts glossy bluish green; underparts white; wings and tail hair brown (dark drab), glossed with green. *Female* similar, but upperparts duller green, shaded with fuscous.

RANGE.—Breeds from northwestern Alaska, southern Mackenzie, and northern Quebec south to southern California, Colorado, Kansas, Arkansas, and Virginia. Winters from central California, southern Texas, the Gulf coast, and southeastern North Carolina south to Guatemala and Cuba.

DISTRIBUTION IN FLORIDA.—An abundant migrant in nearly all parts of the State, and an abundant winter resident in all but the northwestern part, where it is less common.

First arrivals from the North were recorded at Pensacola, August 12, 1917; Fernandina, August 15, 1906; New Smyrna, August 5, 1924; Orlando, August 19, 1909; Fort De Soto, July 31, 1914; and St. Marks, September 9, 1915. Miss Eleanor Earle reported a flock of about 2,000 birds sitting on a sand spit at Passage Key, December 5, 1910; and Nicholson estimated there were 50,000 feeding over the ocean beach on Merritt Island, October 11, 1926. Francis Harper observed a flock of about 6,000 or 7,000 birds, maneuvering over a hammock near Fort Bassenger, February 4, 1917. I found the birds common at Cape Sable in February, 1918, and abundant early in April, 1926. Small numbers were reported on the Tortugas, March 29, 1890 (Scott), and May 3 to 5, 1913 (Bartsch).

The birds linger late in the spring, having been noted in numbers on Sands Key, near Cape Sable, May 10, 1919, and on the St. Johns River marshes, near Malabar, May 11, 1923; and a few on Mosquito Lagoon, May 19, 1925, and at St. Marks, May 31, 1919.

Haunts and Habits.—Like the other swallows, Tree Swallows are strongly gregarious and are usually seen coursing at a moderate height over fields, marshes, ocean beaches, or bodies of water. Their flight is not so swift as that of the Barn Swallow, and they are much given to sailing in circles, interrupted with periods of fluttering. Apparently a large part of their food is procured from the air, but the birds occasionally visit the myrtle thickets to obtain the waxy berries, which in some sections form an important item of their diet. During their migrations, the Tree Swallows roost regularly in large companies in reeds in the marshes, but apparently this habit has not been observed in Florida. During severe cold spells the birds seek shelter under the eaves of buildings, behind shutters, in crevices or knot holes, or in other protected situations, even entering houses through open doors or windows. At such times many perish, either from the cold or from inability to procure food. The disastrous effects of a cold wave at Miami, February 12, 1889, when hundreds of dead swallows were picked up, are described in an article in Bird-Lore (Slosson, 1899, p. 45). Another similar instance occurred in February, 1895, in the same region (H. M. Smith, 1895, p. 183).

Food.—A study in the Biological Survey (Beal, 1918, p. 16) showed the food of this species to consist of about 80 per cent animal matter and 20 per cent vegetable. The vegetable food contained in the stomachs examined was composed of a few varieties of seeds and berries, more than nine-tenths of which consisted of the fruit of a single shrub, the bayberry, or waxberry (*Myrica carolinensis*). These berries were found in 70 stomachs, 30 of which contained no other food, and as they are eaten all the summer, at a time when insects are abundant, it is evident that they form a standard article of diet and are not a makeshift for lack of better food. Other berries, including those of the red cedar, dogwood, and Virginia creeper, are occasionally eaten. The habit of feeding on the berries of the wax myrtle makes it possible for the Tree Swallow to remain all winter farther north than do the strictly insect-feeding species. Of the insect food, flies comprised the largest item, amounting to more than 40 per cent of the total. These included crane flies, horse flies, and house flies, the last being the most numerous. Beetles, including the cotton-boll weevil and other destructive species, are extensively eaten. Other insects taken by this Swallow are ants, wild bees, wasps, leaf hoppers, plant lice, chinch bugs, dragon flies, and moths.

In the celery fields of Florida, these Swallows have proved to be invaluable aids in ridding the fields of the moths of the celery leaf-tier. F. M. Uhler, who studied these birds' habits there during February and March, 1927, writes as follows (in Ms.):

> As soon as a spraying machine began operations, or any similar mechanical disturbance occurred in the celery, causing the moths to take flight, a flock of Tree Swallows abruptly abandoned their usual foraging tactics back and forth over the fields, and concentrated activities in the immediate vicinity of the machine. They would follow it up and down the rows, swirling about the horses and the driver's head like a flock of gnats, and snap up almost every moth that arose.

The stomach of one bird taken in the celery fields was filled almost to the limit, and contained 62 leaf-tier moths, forming 96 per cent of the food, together with 4 flies and 3 seeds of wax myrtle.

BANK SWALLOW: *Ripâria ripâria ripâria* (Linnaeus)

OTHER NAME: Sand Martin

RECOGNITION MARKS.—The smallest of our swallows (length, 4.75 to 5.50 inches; spread, 10 to 11 inches; tail, 1.75 to 2.25 inches, slightly forked. Upperparts, wings, and *a band across the breast* hair brown (dark drab); throat and belly white.

RANGE.—Breeds from northern Alaska to northern Quebec, and south to southern California, Arizona, Texas, Louisiana, central Alabama (casually), and Virginia. Migrates through Mexico and Central America to Brazil and Peru.

DISTRIBUTION IN FLORIDA.—A spring and fall migrant, occurring frequently in large numbers. Because of the difficulty of distinguishing this species from the Rough-wing in the field, records made by inexperienced observers are open to some doubt. Those here given, however, are believed to be accurate. Scott reports the bird at Tarpon Springs, Wayne at Waukeenah, and E. J. Brown at Eustis, all without dates. In spring, the species was noted on the lower Suwannee River, March 26, 1890 (Brewster and Chapman); Whitfield, April 14, 1903 (common April 17, Worthington); Pensacola, April 18, 1926 (Weston); Aucilla River, May 16, 1926 (H. L. Stoddard); and Kissimmee Prairie, May 12, 1929. E. J. Brown observed a large flight of Bank Swallows at Coconut Grove, March 16, 1929, and D. J. Nicholson saw about 250 birds sitting on telephone wires along the Tamiami Trail, 25 miles west of Miami, May 9, 1930. Bartsch records a single bird seen on the Tortugas, June 7, 8, 9, and 15, 1921.

The earliest record of fall migration is that of a specimen noted on the Tortugas, August 15, 1925. Weston reports the species in autumn at Pensacola in only one season, 1929, when it was first seen August 18, became common by September 1, and was last seen October 13. One bird was observed at Fernandina, September 20, 1906.

HAUNTS AND HABITS.—Bank Swallows are strongly gregarious and of rather local distribution, nesting in the North in large colonies in holes in clay banks, and being especially abundant along large rivers. They may be distinguished from the Rough-winged Swallow by the more whitish underparts and the dark band across the breast. They fly with a rather unsteady, flickering flight, and frequent pastures, cultivated lands, and bodies of water.

FOOD.—The food of the Bank Swallow consists almost wholly of insects. Flies constitute more than one-fourth of the total food, house flies and crane flies being most

frequently taken. Beetles form about one-fifth of the total, and include such destructive species as the cotton-boll weevil, alfalfa weevil, rice weevil, and plum curculio. Among the other insects eaten are leaf hoppers, dragon flies, May flies, plant lice, ants, and caterpillars. The bird is wholly beneficial (Beal, 1918, pp. 21–25).

ROUGH-WINGED SWALLOW: *Stelgidópteryx ruficóllis serripénnis* (Audubon)

OTHER NAMES: Sand Martin; Gully Martin

RECOGNITION MARKS.—Slightly larger than the Bank Swallow; nearly as large as the Tree Swallow (length, 5.00 to 5.75 inches; spread, 11.50 to 12.25 inches; wing, about 4.5 inches); upperparts, wings, and tail hair brown (dark drab); underparts light drab, *shading gradually* to white of belly (*no distinct band* on breast).

RANGE.—Breeds from southern British Columbia, Montana, North Dakota, Minnesota, Wisconsin, southern Ontario, southern New York, and Massachusetts south to central Florida, the Gulf coast, Vera Cruz, and Jalisco, Mexico. Winters from central Mexico (casually Florida) to Costa Rica.

DISTRIBUTION IN FLORIDA.—An uncommon migrant and local breeder in the northern and central parts. R. D. Hoyt reported that a few breed near his home at Seven Oaks (Pinellas County), which constitutes the most southerly record. The bird is said to breed also at the mouth of the St. Johns River, Amelia Island, St. Marks, De Funiak Springs, Whitfield, Pensacola, Tarpon Springs (specimens, May 10, 1890), near Fort Christmas, in Duval County east of Jacksonville, and on Moultrie Creek in St. Johns County.

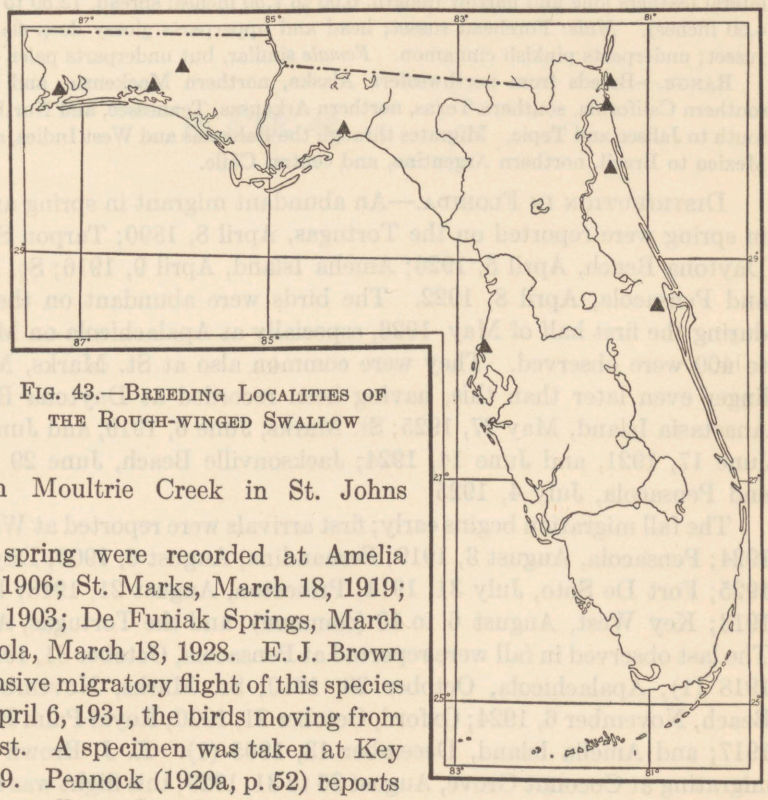

FIG. 43.—BREEDING LOCALITIES OF THE ROUGH-WINGED SWALLOW

First arrivals in spring were recorded at Amelia Island, February 21, 1906; St. Marks, March 18, 1919; Whitfield, March 14, 1903; De Funiak Springs, March 26, 1909; and Pensacola, March 18, 1928. E. J. Brown mentions a very extensive migratory flight of this species observed at Eustis, April 6, 1931, the birds moving from northeast to southwest. A specimen was taken at Key West, October 24, 1889. Pennock (1920a, p. 52) reports a single bird seen repeatedly at St. Marks in the winter of 1916–17 until January 2.

HAUNTS AND HABITS.—The Rough-wing commonly nests in isolated pairs or small colonies in sand banks, crevices in cliffs, or less frequently about buildings. At St. Marks

in May, 1926, a pair was observed carrying nesting material into a hole in the side of a house, under a porch. The birds were so tame they frequently alighted on the telephone wire within 15 feet of people sitting on the porch. S. A. Grimes (1930d, p. 3) found these Swallows nesting in Duval County, near the Inland Waterway, May 2, 1930, and on a drainage canal, 12 miles east of Jacksonville, June 3, 1930. These nests were in holes dug in the side of a sand bank and contained, respectively, 6 and 5 eggs. One of the nests was a full arm's length from the entrance. "It consisted of a double handful of dried rootlets and weed stems, some a quarter of an inch thick and four inches long, a few dried beans of some wild variety, and a lining of dried and partly burnt grass." D. J. Nicholson found a nest containing 5 eggs under a bridge over the St. Johns River, east of Fort Christmas, June 1, 1930. The nest, built against the side of a timber about 8 feet above the water, was constructed of grass and weed stems and lined with small pieces of grass and a tiny piece of dried turtle egg shell.

BARN SWALLOW: *Hirúndo erythrogâster* Boddaert

Recognition Marks.—About the size of the Cliff Swallow, *but tail very long and deeply forked*, the lateral feathers long and narrow (length, 6.00 to 7.50 inches; spread, 12.50 to 13.50 inches; tail, 3.00 to 4.50 inches). *Male:* Forehead russet; head and upperparts glossy deep slate-blue; throat and chest russet; underparts pinkish cinnamon. *Female* similar, but underparts paler (pale pinkish buff).

Range.—Breeds from northwestern Alaska, northern Mackenzie, and central Quebec south to southern California, southern Texas, northern Arkansas, Tennessee, and North Carolina; also in Mexico south to Jalisco and Tepic. Migrates through the Bahamas and West Indies, and winters from southern Mexico to Brazil, northern Argentina, and central Chile.

Distribution in Florida.—An abundant migrant in spring and fall. First arrivals in spring were reported on the Tortugas, April 8, 1890; Tarpon Springs, April 3, 1895; Daytona Beach, April 5, 1926; Amelia Island, April 9, 1916; St. Marks, April 9, 1917; and Pensacola, April 8, 1922. The birds were abundant on the northern Gulf coast during the first half of May, 1926, especially at Apalachicola on May 6 and 7, when 300 to 400 were observed. They were common also at St. Marks, May 18 to 20. A few linger even later than this, having been recorded at Daytona Beach, May 28, 1925; Anastasia Island, May 27, 1925; St. Marks, June 6, 1919, and June 18, 1915; Tortugas, June 17, 1921, and June 14, 1924; Jacksonville Beach, June 29 (Grimes, 1930, p. 5), and Pensacola, July 4, 1925.

The fall migration begins early; first arrivals were reported at Wakulla Beach, July 27, 1924; Pensacola, August 3, 1919; Fernandina, August 6, 1906; Daytona Beach, July 30, 1925; Fort De Soto, July 31, 1914; Princeton, August 21, 1918; Key Largo, August 2, 1913; Key West, August 6 to 10 (common); and the Tortugas, August 13 to 24, 1925. The last observed in fall were reported at Pensacola, October 31, 1926, and November 23, 1918 (1); Apalachicola, October 29, 1910; St. Marks, November 7, 1915; Daytona Beach, November 6, 1924; Oxford, October 21, 1920; Royal Palm Hammock, October 27, 1917; and Amelia Island, December 13, 1905 (1). E. J. Brown noted large numbers migrating at Coconut Grove, August 26 to 31, 1929; this flight was mainly near the coast, as none were observed more than 7 miles inland.

Haunts and Habits.—During their migrations, Barn Swallows are almost constantly on the wing, coursing swiftly over fields or marshes in pursuit of their insect prey. They

PLATE 48

EXPLANATION OF PLATE 48

BIRDS OF THE SCRUB

Dreary miles of sandy scrub lands border portions of both the east and west coasts of Florida, and smaller areas occur in the interior. These tracts support a fairly numerous bird population, especially in winter. With the exception of the two species of warblers, the birds shown in this scene are permanent residents of the scrub. At the upper left is a Loggerhead Shrike; at the upper right, a Mockingbird; in the upper center, two Florida Jays; the two flying birds are Myrtle Warblers (male and female); at the right is a Palm Warbler and at the bottom a male, and on the ground a female, White-eyed Towhee.

fly very swiftly, usually rather close to the ground, and their evolutions are performed with consummate grace and skill. Occasionally numbers of them alight in long rows on telephone wires and at such times they usually carry on a conversational twittering. These musical notes are frequently given also on the wing, and at times are sufficiently elaborate to be called a song.

Food.—The food of the Barn Swallow, as shown by the investigations of Professor Beal (1918, pp. 11–15), is composed almost entirely of animal matter—insects, with a few spiders and snails. In the stomachs examined, Diptera, or flies, constituted the largest item, amounting to almost 40 per cent of the total contents. Beetles, including weevils, were next in order, comprising about 16 per cent of the total. The destructive cotton-boll weevil is eaten in considerable numbers in the summer and fall, at the time when the insects are flying about considerably. Ants formed nearly 10 per cent of the food, and other Hymenoptera about 12 per cent. Hemiptera, or bugs, furnished 15 per cent, and included stink bugs, chinch bugs, plant lice, and leaf hoppers. Dragon flies are captured in some numbers.

NORTHERN CLIFF SWALLOW: *Petrochelidon ălbifrons ălbifrons* (Rafinesque)

Other Name: **Eaves Swallow**

Recognition Marks.—About the size of the Tree Swallow (length, 5 to 6 inches; spread, 12 to 12.30 inches; tail, 2.00 to 2.40 inches, *nearly square*). *Forehead creamy white;* upperparts glossy bluish slate-black; *rump cinnamon or pinkish cinnamon* (conspicuous in flight); throat and sides of head bay, with a bluish black patch in the center of throat; underparts white.

Range.—Breeds from central Alaska, north central Mackenzie, northern Ontario, and central Quebec south to southern Texas, northwestern Arkansas, Kentucky, Virginia (locally), and northern Alabama (one colony). Migrates through Central America, and probably winters in Brazil and Argentina.

Distribution in Florida.—A regular spring and fall migrant, usually rare, but occasionally common. First arrivals in spring were reported at Pensacola, March 24, 1886; Whitfield, April 15, 1903; De Funiak Springs, May 3, 1909; and St. Marks, May 10, 1917. E. J. Brown observed thousands of these birds migrating at Eustis, March 24 and 25, and April 7, 1931. We saw about 15 at the mouth of the Aucilla River, May 16, 1926, and 3 at St. Marks, May 20, 1926. Bartsch noted single birds on the Tortugas, May 14 and 19, 1922.

The first seen in fall were recorded at De Funiak Springs, August 16, 1909 (5); St. Marks, September 9, 1915; Coronado Beach, September 22, 1910; and Fort Pierce, September 28, 1918. Mrs. Byrd reported 16 seen at Oxford, October 30, 1920, and hundreds near Royal Palm State Park, November 11, 1917, as narrated under the Purple Martin. E. J. Brown noted the birds in abundance at Eustis during October, 1925, and at Coconut Grove, August 26 to 31, 1929. On March 4, 1930, large numbers were seen late in the afternoon, at Coconut Grove, moving southward. D. J. Nicholson observed several at Key West, November 16 and 27, 1930.

Haunts and Habits.—Cliff Swallows are sociable birds, traveling in flocks of their own kind or mixing with other species of swallows, and nesting in colonies under the eaves of barns or other farm buildings, or sometimes even on buildings in the midst of

towns. During their migrations the birds often alight in numbers on the telephone wires along the roadsides. They procure their food entirely from the air, coursing at no great height over pastures, cultivated fields, ponds, rivers, and marshes.

FOOD.—The food of the Cliff Swallow consists almost entirely of insects, most of them taken on the wing. Beetles, ants, bees, wasps, flies, and bugs make up the greater part of the food, and include such destructive species as the chinch bug and the cotton-boll weevil. During late summer and fall, when these Swallows are moving southward in large flocks, they capture immense numbers of boll weevils over the cotton fields. Thirty-five birds shot in Texas in September had eaten a total of 678 weevils, one bird having consumed 48 of the insects at a single meal. Honey bees (all drones) were identified in 13 of the 375 stomachs examined. (Beal, 1918, pp. 6–11.)

CUBAN CLIFF SWALLOW: *Petrochelidon fúlva cavícola* Barbour and Brooks[1]

RECOGNITION MARKS.—Smaller than the common Cliff Swallow (length, under 5 inches; wing, 4.00 to 4.25 inches; tail 1.65 to 1.88 inches); similar in color above, but *forehead brown* instead of whitish, and rump darker (tawny or russet); throat paler (pinkish cinnamon).

RANGE.—Cuba. Accidental in Florida.

DISTRIBUTION IN FLORIDA.—Known from two specimens taken by W. E. D. Scott (1890d, p. 264) on the Tortugas, March 22 and 25, 1890. These are now in the Museum of Comparative Zoölogy and have been identified by James L. Peters as belonging to the present race. On March 29, 1890, at the same locality, Scott (1890e, p. 311) observed another individual in a flock of Tree Swallows.

PURPLE MARTIN: *Progne súbis súbis* (Linnaeus)

OTHER NAMES: Black Martin; Gourd Martin; House Martin

RECOGNITION MARKS.—The largest of the American swallows (length, 7.25 to 8.00 inches; spread, 15.50 to 16.50 inches; tail 3.00 to 3.50 inches, moderately forked). *Adult male:* Body glossy dark slate-blue; wings and tail sooty black. *Adult female:* Upperparts duller than in the male, varied with drab; throat and breast hair brown (dark drab), mottled with white, shading to dull white on the belly.

RANGE.—Breeds from central Alberta, southern Saskatchewan, southern Manitoba, central Ontario, New Brunswick, and Nova Scotia west to Montana and Idaho, and south to the Gulf coast, Florida, Vera Cruz, and Jalisco. Winters in Brazil. Accidental in Bermuda.

DISTRIBUTION IN FLORIDA.—A common summer resident over the greater part of the State, except the extreme southern portion. It has been recorded as breeding at Homestead, Fort Lauderdale, Jupiter, Blue Cypress Lake (Osceola County), Naples, Immokalee, La Belle (13 miles southeast), Punta Gorda, Sarasota, Citrus Center, Fort Capron (Indian River), Orange City, Fernandina, and many other places. Breeding specimens taken in southern Florida (La Belle, Alva, Naples, and Kenansville) all proved to be typical *subis*, and not *cryptoleuca* as it had been surmised they might be (cf. Scott, 1889a, p. 325).

This is one of the earliest of the spring migrants, but the dates of arrival vary considerably from year to year. The average date at Melrose for 12 years was February 9, the earliest being January 20 (1901). The first arrivals were reported at Arcadia, January

[1] For original description, see Proc. New England Zool. Club, vol. 6, p. 52, January 13, 1917.

PLATE 49

EXPLANATION OF PLATE 49

BIRDS OF THE PINE WOODS

The open pine flats of Florida, stretching on and on for seemingly endless distances, lend a sense of monotony to the landscape. Bird life in these areas is relatively scarce, but a number of interesting species make their permanent homes here. The characteristic forms are shown here.

The two birds at the upper left are a pair of Pine Warblers (male and female); at the lower left is a Yellow-throated Warbler; at the upper right a Pine-woods Sparrow; in the right center are a White-breasted Nuthatch and a Brown-headed Nuthatch; beneath them is a Red-cockaded Woodpecker.

25, 1920; Fort Myers, February 2, 1926; Kissimmee, January 24, 1902; Orlando, January 19, 1929; New Smyrna, January 28, 1923; Tallahassee, January 29, 1911; St. Marks, February 3, 1917; and Pensacola, February 5, 1919. The last noted in fall were recorded at Pensacola, October 2, 1929; De Funiak Springs, September 22, 1909; Tallahassee, September 27, 1901; Chokoloskee, September 24, 1915; Sombrero Key Light, October 6, 1885; and St. Marks, November 10, 1912. Three individuals seen by H. W. Ballantine at Orlando, December 18, 1915, may be considered wintering birds.

A large flight was reported by Mrs. Hiram Byrd between Royal Palm Hammock and Homestead in November, 1917. She says (in letter):

> At 4 p.m., November 4, the Martins were observed circling over a glade at the edge of the Park, and as far as we could see. Starting home (toward Homestead) they did not diminish in numbers until we had gone nine miles. We roughly estimated ten to the acre. In places the air was thickly peppered with them. There might have been anywhere from a hundred thousand to a million or more. Again, late in the afternoon of November 11th, we saw great flocks of swallows over the glades. Some were Martins, some Cliff Swallows.

At Eustis, November 24, 1930, between 4 and 5 o'clock, p.m., E. J. Brown observed a flight of about 1,000 Martins moving in a southwesterly direction. At the same place, March 17 and 18, 1931, he noted a very extensive migratory flight.

Haunts and Habits.—The Purple Martin is at present largely semidomestic in its habits, and its presence on the farm is mainly dependent on boxes or gourds put up for its use as nesting sites. In some sections, however, it still clings to its primitive habit of nesting in hollow trees. In a little glade in the pine forest 13 miles southeast of La Belle we found several pairs breeding in tall dead pines, and the same habit was observed among a small colony near Naples. Maynard (1895, p. 529) mentions finding the birds nesting in stubs near Fort Capron. At Sarasota, in May, 1918, I observed a pair that had taken up quarters under the eaves of a hotel on the main street, probably in a hole in the tiling of the roof. On Anna Maria Key, the same month, I noticed a Martin going into a hole in a cabbage palm piling at the dock, 3 feet above the water. Scott (1881, p. 15) reported finding a pair breeding in a decayed mangrove close to the water at Clearwater, and R. D. Hoyt took a set of eggs from a nest placed on a beam under the floor of a dock at Seven Oaks.

Martins are sociable birds, always nesting in colonies, many pairs frequently occupying different compartments in a single Martin house. Their presence about the farm is usually encouraged, both because of their friendly ways and cheerful notes, and because of the belief that they keep hawks away from the poultry yard. Nesting begins in April and may continue until early in July (H. H. Bailey, 1925a, p. 114). Eggs were found at Seven Oaks, April 18, 1905; Archer, April 25, 1888; and Gainesville, May 1, 1894, and Jacksonville, May 2, 1930. The sets usually number 4 or 5 eggs.

Late in summer the Martins gather into large flocks and roost at night in a body in some selected tree along a town or city street, or in long grass or rushes in marshes. G. Clyde Fisher (1907, p. 119) describes a roost that he examined early in August, as follows:

> I saw the Purple Martins nowhere nearly so abundant as at Quincy, Gadsden County, Florida. There were very few to be seen here during the middle of the day, but towards evening they would gather in.

It was impossible to tell where they came from, but in a very short time, and just before sunset, there would be thousands of them in the air circling over the town. The sky was alive with them until about dusk, when they went to roost. The noise of their chatter was continuous during this time. They gradually collected in a more compact body and swung around over the town in large gyrations, until finally a little before dark, as if of one mind, they dropped into a small clump of mulberry trees. With great noise of wing as well as of voice, they fairly fell into these trees with a rush that was truly astonishing. These trees are in the central part of the town, near the Lorraine hotel. They had all settled in less time than it takes to write. I believe that it would be conservative to estimate their number at more than five thousand. After getting settled, their noise was intense; from a little distance it sounded much like escaping steam, or like the patter of violent rain on the leaves of the trees. This noise continued intermittently until late into the night, and began again with energy before daylight in the morning. The birds began to leave just about dawn,—a few straggling little bunches leading off, and then practically all of the rest taking wing at once and swinging off in one grand departure.

Food.—Professor Beal (1918, pp. 3–6) studied the food of the Martin and found it to consist entirely of insects, with a few spiders. Hymenoptera—ants, bees, and wasps—furnish the largest item, amounting to 23 per cent of the total. The bird has frequently been accused of destroying honey bees, but examination of more than 200 stomachs showed only 5 containing these insects, all of them drones. Flies, including many long-legged tipulids and some of the house-fly family, are eaten to a considerable extent, forming about 16 per cent of the food. Hemiptera, or bugs, including stink bugs, tree hoppers, negro bugs, and one squash bug, were found in the stomachs and formed nearly 15 per cent. Beetles amounted to about 12 per cent and included May beetles, ground beetles, dung beetles, the cotton-boll weevil, clover weevil, and other species destructive to nuts and seeds. Small moths are frequently eaten and butterflies occasionally. Dragon flies constitute a favorite food, having been found in 65 of the stomachs examined, 7 containing no other food.

CUBAN MARTIN: *Progne cryptoleuca* Baird

Recognition Marks.—*Adult male:* Exactly like the Purple Martin, except that the feathers of the lower abdomen are crossed with a broad but concealed band of white. *Adult female:* Similar above to the female Purple Martin, but with a pronounced fuscous wash, especially on the head and rump; underparts very different; throat, breast, and sides between hair brown and drab, *sharply contrasted with the creamy white belly.*

Range.—Cuba. Accidental in southern Florida.

Distribution in Florida.—Known from two accidental records, as follows: Cape Florida, May 18, 1858; Clearwater (no date). These specimens have been examined in the United States National Museum collection.

The breeding Martins of southern Florida, supposed by Scott (1889a, p. 325) to be *cryptoleuca*, have been proven to be *P. subis subis* (see p. 334).

JAYS and CROWS: Family Corvidae

SOUTHERN BLUE JAY: *Cyanocitta cristata cristata* (Linnaeus)

Recognition Marks.—Length, 11 to 12.5 inches; spread, 16 to 17.5 inches; *head crested.* Upperparts mainly grayish violet-blue; throat pale bluish gray; a black crescent on throat; underparts drab-gray, with some white; wings and tail with conspicuous white patches.

RANGE.—Southeastern United States, north to central North Carolina, northern Alabama, southwestern Indiana, southern Illinois, central Arkansas, and northeastern and central Texas, and south to central Florida.

DISTRIBUTION IN FLORIDA.—An abundant resident in northern Florida, south to Lake County, where it grades into the subspecies *semplei*. Specimens of this race have been examined from Milton, Mulat, Whitfield, Cherry Lake (Madison County), Benton, Branford, Hibernia, Welaka, San Mateo, Enterprise, Mullet Lake, Wilson, and Eustis.

I am informed by Outram Bangs that the "type" (neotype) of *Cyanocitta florincola* Coues is No. 5190, Museum of Comparative Zoölogy, taken at Welaka, Florida, February 3, 1869, by J. A. Allen and T. Marcy. As shown by a note on the label, this specimen was "selected as the type by W. Brewster at request of Dr. Coues, March 9, 1898." Examination of two specimens from Welaka in the United States National Museum shows them to be referable to *cristata* rather than to *semplei* of southern Florida.

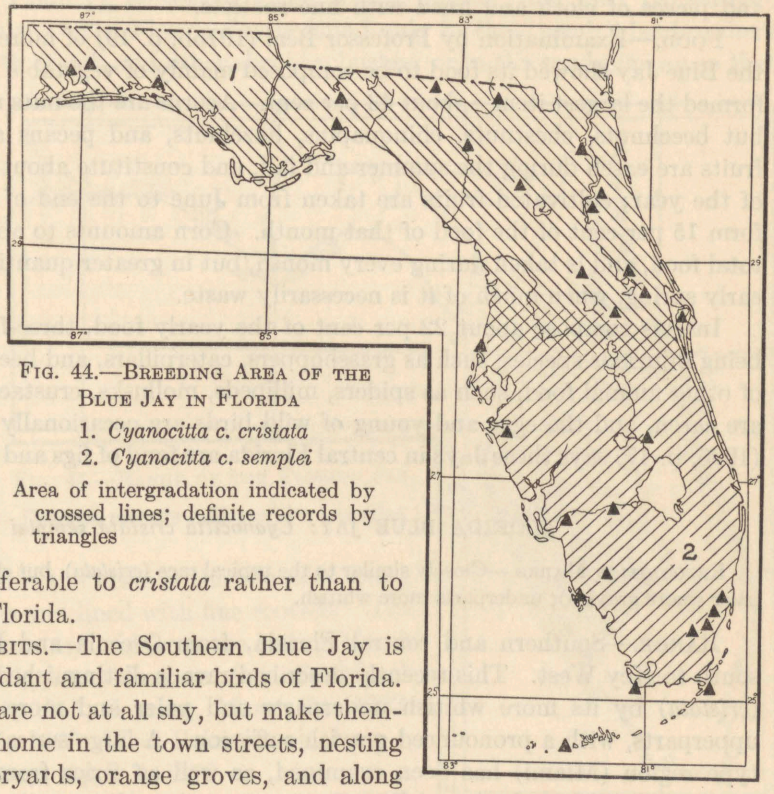

FIG. 44.—BREEDING AREA OF THE BLUE JAY IN FLORIDA

1. *Cyanocitta c. cristata*
2. *Cyanocitta c. semplei*

Area of intergradation indicated by crossed lines; definite records by triangles

HAUNTS AND HABITS.—The Southern Blue Jay is one of the most abundant and familiar birds of Florida. These southern birds are not at all shy, but make themselves very much at home in the town streets, nesting freely in trees in dooryards, orange groves, and along the highways. They are found less commonly in pine woods, hammocks of oak or mixed timber, turkey-oak scrub, and the borders of small cypress swamps. The birds are noisy and restless during the greater part of the year, moving about in small companies or loose flocks, calling vigorously as they go. While for the most part indifferent to the presence of man, they nevertheless retain a degree of caution and can scarcely be tamed enough to eat from one's hand, as can the Florida Jays. They take great delight in worrying owls whose retreats they may discover, and their reputation for robbing the nests of smaller birds is rather bad.

Nesting begins late in March or early in April and continues until July or August, at least two sets of eggs being laid in a season, the eggs numbering 3 or 4 to a set. Eggs were found at Tallahassee, April 1, 1895; Orlando, March 23, 1911, April 3, 1923, and

July 25 and August 29, 1911; St. Marks, April 13, 1914; and Gainesville, April 4, 1895. D. J. Nicholson writes of the birds at Orlando (Ms. notes):

In the season of 1910 a few pairs bred in the latter part of March, but the majority commenced to nest about April 5; the second sets were found about June 1–8; the height of the third nesting period was July 23, when 2 sets of 3 eggs each were collected, and other occupied nests observed. The first sets nearly always comprised 4 eggs, the second sets either 3 or 4, the third sets nearly always 3.

The nests are placed in trees—commonly oak, orange, or pine—at a height of 8 to 35 feet above the ground, and are composed of twigs, Spanish moss, string, pine needles, and pieces of cloth and lined with fine rootlets.

Food.—Examination by Professor Beal (1915b, p. 19) of more than 500 stomachs of the Blue Jay showed its food to be composed mainly of vegetable matter, of which mast formed the largest item—about 43 per cent. Acorns are the nuts most frequently eaten, but beechnuts, chestnuts, chinquapins, hazelnuts, and pecans are also taken. Wild fruits are eaten during the summer and fall, and constitute about 7 per cent of the food of the year; cultivated fruits are taken from June to the end of the year, and in July form 15 per cent of the food of that month. Corn amounts to about 18 per cent of the total food, and is taken during every month, but in greater quantities during winter and early spring, when much of it is necessarily waste.

Insects compose about 22 per cent of the yearly food, three-fourths of this amount being injurious species, such as grasshoppers, caterpillars, and beetles. Small quantities of other animal food, such as spiders, millipeds, mollusks, crustaceans, mice, and fishes, are eaten, and the eggs and young of wild birds are occasionally destroyed. Nehrling (1906, p. 17) says these Jays in central Florida are fond of figs and Japanese persimmons.

Semple's FLORIDA BLUE JAY: *Cyanocitta cristâta sémplei* Todd

Recognition Marks.—Closely similar to the typical race (*cristata*), but slightly smaller; upperparts paler (more grayish); underparts more whitish.

Range.—Southern and central Florida, from Osceola and Hillsborough Counties south to Key West. This recently described race is distinguished from the typical race (*cristata*) by its more whitish underparts and paler and more bluish (less purplish) upperparts, with a pronounced grayish suffusion. A large series of specimens from the type region (Miami) has been examined, as well as series from Fort Myers, Tarpon Springs, Fort Thompson, and Fort Bassenger, and smaller numbers from the Kissimmee River, Braden River, and Royal Palm Hammock. The birds were observed in small numbers at Caxambas, Deep Lake, Homestead, and Cape Sable. They are reported to be fairly common on Key Largo and on Key West.

Haunts and Habits.—As in the typical race.

FLORIDA JAY: *Aphelócoma coerulêscens* (Bosc)

Other Name: Scrub Jay

Recognition Marks.—About the size of the common Blue Jay, but of slenderer build; *tail longer; head not crested;* nape, rump, and wings Yale blue (dark sky blue); tail indigo-blue; back light drab; underparts smoke gray or light drab. (Plate 48.)

RANGE.—Peninsular Florida; locally distributed on the east coast from the mouth of the St. Johns River south to Rockdale, on the west coast from Pine Point and Wannee south to Naples, and in the interior from Micanopy south to Immokalee. It has been recorded from Cedar Keys, Sumner, Dunedin, Alva, Fort Myers, Punta Rassa, Punta Gorda, Fish-eating Creek, Fort Thompson, Tarpon Springs, Venice, Sarasota, Zellwood, Panasoffkee Lake, Orange Springs, Sebring, Venus, Blue Springs, Enterprise, New Smyrna, Daytona Beach, Lake George, Orlando, Eau Gallie, Wilson, Georgiana, Cape Canaveral, Pellicier's Creek (St. Johns County), Enterprise, Palatka, St. Augustine, Fort Gates (Putnam County), Sebastian, Lake Worth, Jupiter, and Fort Lauderdale.

HAUNTS AND HABITS.—The Florida Jay is found only in the "scrub" lands, where there is a dense growth of oak and other shrubby bushes, or in the sand-pine areas that frequently adjoin such tracts. Here the birds live in loose colonies, sometimes a dozen pairs or more in a restricted area, or in other cases only 2 or 3 pairs together. Their nests are placed in oak or myrtle bushes or in sand-pine trees (*Pinus clausa*), 2 to 12 feet above the ground. They resemble the nests of the Blue Jay, being composed of oak twigs and lined with fine rootlets. The eggs, 2 to 4 in number, are laid from the last of March to the last of May. Eggs were found at Orlando, March 28, 1923, and May 16, 1915; Sebring, March 31, 1923; Orange City, April 5, 1920; West Palm Beach, June 4, 1913; and Sarasota Bay, April 7, 1872.

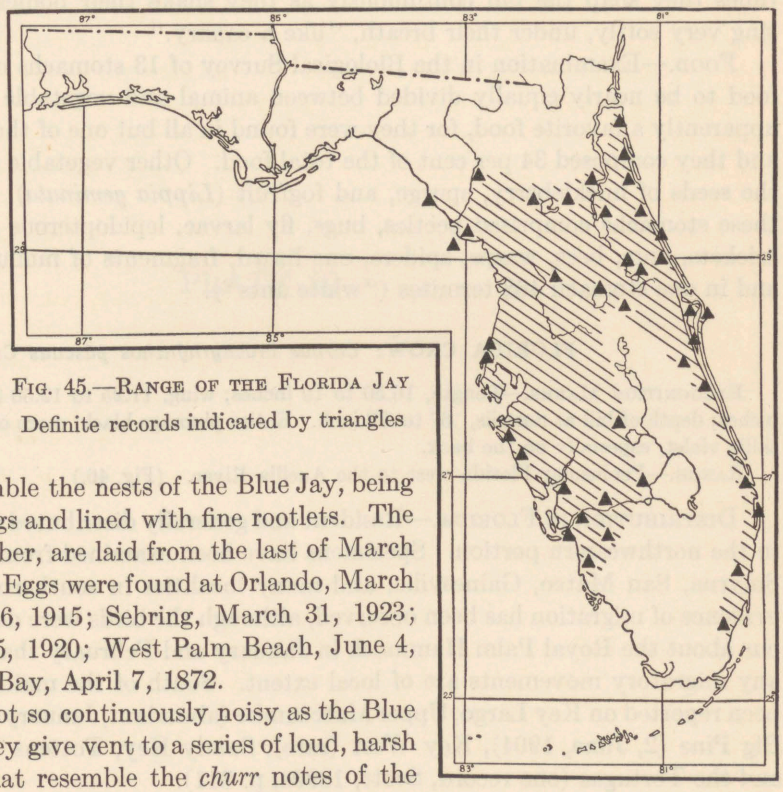

FIG. 45.—RANGE OF THE FLORIDA JAY
Definite records indicated by triangles

These Jays are not so continuously noisy as the Blue Jays, but at times they give vent to a series of loud, harsh calls, which somewhat resemble the *churr* notes of the Boat-tailed Grackle. Occasionally they attempt a soft song somewhat like that of the Blue Jay—"a mixture of low sweet-toned calls, high in pitch, mingled with others that were variously slurred or trilled in utterance" (A. Wetmore). The long tail of this Jay is a striking field mark, and the gray area of the back shows up well. When the bird is seated on a perch, the tail hangs down, but when excited, it jerks it up at an angle and twitches it rapidly. The birds feed a good deal on the ground, making long hops and probing the loose sand with their bills.

Miss Edith Werner, who in the spring of 1923 was operating a tea house on the shore

of Lake Jackson, near Sebring, has been remarkably successful in taming the Florida Jays, which are abundant in the scrub close to her house. She whistles a bright little tune and in a few minutes the Jays appear from all directions and without hesitation alight on her arm or shoulder to take the pieces of bread she offers them. She told us she had been a year or more taming the birds, and that it was a month or more before she could get them near her. At the time of our visit, however, they had become so used to strangers that they allowed us to feed them and even alighted on our heads or shoulders. On hearing a note of alarm from one of the Jays in the brush, they all deserted us and flew into the scrub. Miss Werner says the birds always have a lookout posted on a high bush, which sentinel remains there while the rest are feeding and gives warning of danger. She added that they often frolic together in the morning, at which times they snap the bill continuously as they shake their bodies. Occasionally they sing very softly, under their breath, "like a canary."

FOOD.—Examination in the Biological Survey of 13 stomachs of this Jay showed its food to be nearly equally divided between animal and vegetable matter. Acorns are apparently a favorite food, for they were found in all but one of the stomachs examined, and they composed 34 per cent of the total food. Other vegetable items consumed were the seeds of huckleberry, spurge, and fogfruit (*Lippia geminata*). The animal food in these stomachs comprised beetles, bugs, fly larvae, lepidopterous larvae, grasshoppers, crickets, ants, bees, wasps, spiders, one lizard, fragments of mollusks and crustaceans, and in one stomach 468 termites ("white ants").

FLORIDA CROW: *Córvus brachyrhýnchos pâscuus* Coues

RECOGNITION MARKS.—Length, 16.50 to 19 inches; wing, 11.25 to 12.50 inches; bill, 1.87 to 2.10 inches; depth of bill at nostrils, .67 to .78 inch. Entire plumage black, more or less glossed with metallic violet, especially on the back.

RANGE.—Peninsular Florida west to the Aucilla River. (Fig. 46.)

DISTRIBUTION IN FLORIDA.—Resident and generally distributed over the State, except in the northwestern portion. Specimens have been examined from Amelia Island, New Smyrna, San Mateo, Gainesville, and many localities in southern Florida. No direct evidence of migration has been observed, although the birds were decidedly more numerous about the Royal Palm Hammock in January and February than in June. Probably any migratory movements are of local extent. South of the mainland, the species has been reported on Key Largo, Upper Matecumbe (abundant, January to April), Key Vacas, Big Pine (2, June, 1904), Key West (rare), Sandy Key, Tottens Key, Palo Alto Key, and the Tortugas (one record, Scott, 1890e, p. 311).

Intergradation with *paulus* apparently takes place in the St. Marks region, for although the prevailing form there appears to be *paulus*, two specimens taken in January and October, respectively, are referable to *pascuus*.

HAUNTS AND HABITS.—The Florida Crow, although generally distributed, is apparently less abundant than its relatives in many of the Northern States. The birds are found in the pine forests, hammocks, prairies, and the smaller cypress swamps. In the southern part of the State, where they are seldom hunted, they are remarkably tame. The nests are frequently placed in oak trees in the hammocks, sometimes in pine trees

PLATE 50

EXPLANATION OF PLATE 50

WRENS

The upper figures from left to right, are: Bewick's Wren, Florida Wren, and House Wren; below at the right are three races of Long-billed Marsh Wrens—the Prairie Marsh Wren in the center; Marian's at the left and Worthington's at the right; the lower figure at the left is a Short-billed Marsh Wren.

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near the border of a cypress swamp, or in a lone tree on the prairie, 7 to 40 (rarely 60) feet above the ground. They are composed of oak twigs and Spanish moss, and lined with horse hair, cabbage-palm fiber, and small pieces of bark. The eggs, numbering usually 3 to 5, sometimes only 2 and rarely 6, are laid in February and March, the dates for fresh eggs on the Kissimmee Prairie ranging from February 8 to March 29. Nicholson took a set of 4 eggs at Lake Jackson, Osceola County, January 21, 1924. On Gray Rock Key, near Chokoloskee, March 25 and April 3, 1925, E. J. Court found several nests in black mangrove trees, composed of dried bleached sticks and drift grass, and lined with finer material and a quantity of gray moss. At Everglade and Deep Lake we heard the Crows utter a peculiar note, not heard elsewhere; it suggested the rattling call of the Sandhill Crane, though not so loud, and resembled, also, the "churring" note of the Red-bellied Woodpecker.

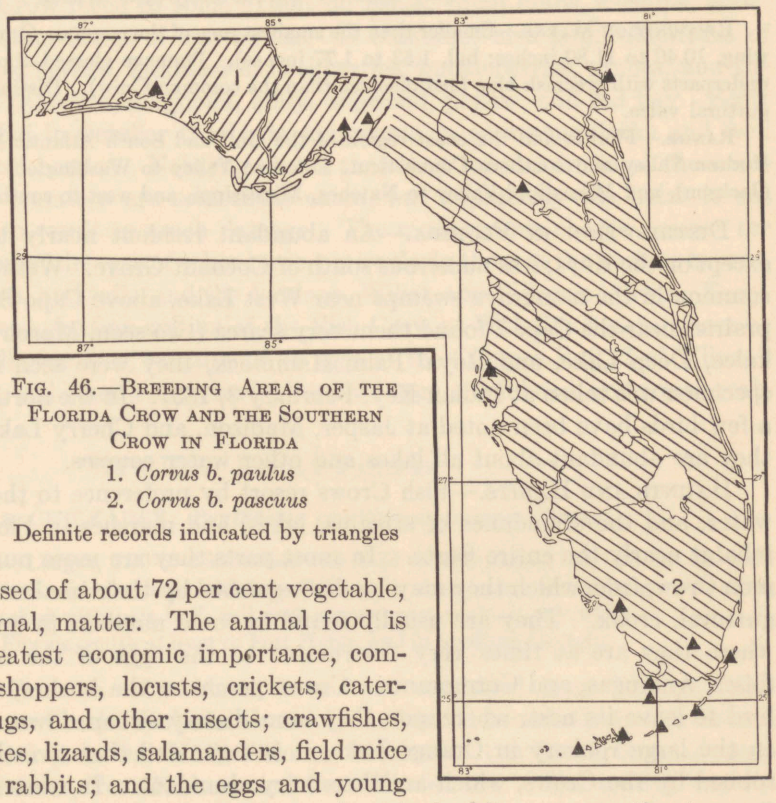

FIG. 46.—BREEDING AREAS OF THE FLORIDA CROW AND THE SOUTHERN CROW IN FLORIDA

1. *Corvus b. paulus*
2. *Corvus b. pascuus*

Definite records indicated by triangles

FOOD.—The food of the Crow has been exhaustively studied by E. R. Kalmbach (1918, pp. 85–86) of the Biological Survey. He finds that it is composed of about 72 per cent vegetable, and 28 per cent animal, matter. The animal food is considered of the greatest economic importance, comprising beetles, grasshoppers, locusts, crickets, caterpillars, cutworms, bugs, and other insects; crawfishes, mollusks, fishes, snakes, lizards, salamanders, field mice and rats, and young rabbits; and the eggs and young of wild birds. Of the vegetable food, corn forms the principal item, amounting to more than 38 per cent of the total food of adult crows; and wheat, oats, and other small grains are eaten to a less extent. Wild fruits, including sumac, poison ivy, bayberry, wax myrtle, greenbrier, Virginia creeper, sour gum, dogwood, and many others, compose about 14 per cent of the food. At Royal Palm Hammock, in October, 1918, C. A. Mosier reported Crows feeding on acorns and snails.

SOUTHERN CROW: *Córvus brachyrhýnchos páulus* Howell

RECOGNITION MARKS.—Smaller than *pascuus*, with smaller and slenderer bill (wing, 10.60 to 12.00 inches; bill, 1.80 to 1.97 inches; depth of bill at nostrils, .63 to .70 inch).

RANGE.—Southeastern Texas, Louisiana, Mississippi, Alabama, and western Florida, north to southern Illinois and the District of Columbia.

DISTRIBUTION IN FLORIDA.—Occurs in the northwestern part of the State, east to the Aucilla River. (Fig. 46.) Three male specimens taken at St. Marks in January, and one female taken in March, are typical of this race, and it is believed to be the form breeding in that locality. Two breeding females taken on the Wacissa River, May 14, 1926, are intermediate between *paulus* and *pascuus*, but nearer to the former. Fresh eggs were found at St. Marks, on April 1, 1917, and March 28, 1918.

FISH CROW: *Córvus ossífragus* Wilson

RECOGNITION MARKS.—Smaller than the smallest race of the common Crow (length, 14 to 16 inches; wing, 10.40 to 11.80 inches; bill, 1.53 to 1.77 inches). Plumage glossed above with bluish violet, the underparts with greenish blue (less blackish than the common Crow). Distinguished also by its hoarse, guttural voice.

RANGE.—Florida and the coast region of the Gulf and South Atlantic States north to the lower Hudson Valley and southern Connecticut, Potomac Valley to Washington, D. C., southern Alabama (Jackson), and Mississippi Valley to Natchez, Mississippi, and west to southeastern Texas.

DISTRIBUTION IN FLORIDA.—An abundant resident nearly throughout the State, except on the Keys; less numerous south of Coconut Grove. Wetmore reported the birds common in the mangrove swamps near West Lake, above Cape Sable, but on the coast prairies near the Cape I found them very scarce (two seen, March 28, 1926). At Immokalee, Deep Lake, and Royal Palm Hammock, they were seen in small numbers. A specimen was taken at Indian Key, February 3, 1857. In the northern part of the State, a few birds have been noted at Jasper, Madison, and Cherry Lake; in the central part, they are abundant about all lakes and other water courses.

HAUNTS AND HABITS.—Fish Crows resort by preference to the vicinity of bodies of water, and the abundance of streams, lakes, and marshes in Florida permits them to inhabit nearly the entire State. In most parts they are more numerous than the common Crow, from which they may be distinguished by their smaller size and weaker, more guttural, croak. They are usually found in some numbers in or near heron rookeries, where they are at times very destructive to the eggs of the nesting birds—herons, ibises, Anhingas, and Cormorants. Crows perch on the bushes, watching for a sitting bird to leave its nest, whereupon they immediately swoop down and carry off an egg. In the large rookery in Orange Lake, it is estimated that two-thirds of the nests are robbed by the Crows, which are there very abundant. In winter, in that locality, the Crows gather in immense numbers to roost; the warden, M. N. Gist, estimated the winter Crow population at 50,000, some of which may have been Florida Crows (*Corvus brachyrhynchos pascuus*).

At Goose Creek, Wakulla County, in January, 1920, we observed long lines of Fish Crows every morning shortly after sunrise, flying westward along the beach from the direction of St. Marks Light. Several residents of the neighborhood told us that the birds roosted on beaten down tracts of rushes and drift in the marshes along the lower course of the St. Marks River. At Panasoffkee Lake, Crows are said to roost in large numbers in willow bushes in the marsh at the edge of the lake. At Lake Monroe, February 18, 1897, Worthington saw a flock of about 2,000 Fish Crows going to roost in rushes.

Fish Crows forage to a great extent along the shores of rivers, lakes, sloughs, and bays, and on the ocean beaches. They come into the towns and villages to pick up refuse and often visit orchards or cultivated lands to procure fruits or vegetables. Their nests are commonly placed in the tops of slender pines, or sometimes in a cabbage palm, 20 to 50 feet (sometimes 80 feet), above the ground, and are composed of sticks with some Spanish moss attached and lined with pine needles, strips of bark, and Spanish moss. The birds nest later than the Florida Crow, eggs having been found in Hillsborough County, April 30, 1888; on the Kissimmee River, May 2, 1876; near San Mateo, May 13, 1892; and at Lake Hart, Osceola County, May 20, 1929.

Food.—The Fish Crow feeds to some extent on fishes, small crabs, shrimps, crawfishes, mollusks, and other forms of marine life. It consumes also large quantities of wild fruits, such as pokeberries, mulberries, hackberries, huckleberries, grapes, and the fruit of the sour gum, palmetto, magnolia, holly, dogwood, papaw, and red bay. Scott (1889a, p. 319) says that in October the birds congregate in enormous flocks and feed extensively on palmetto berries. Nehrling states that they eat the fruits of the cocos palms. Oranges and tomatoes are sometimes eaten, but apparently the habit is not sufficiently prevalent to result in much damage. The most serious charge against the species is its destruction of the eggs of other birds, particularly those of the various herons, ibises, cormorants, terns, and rails, and the Anhinga, Willet, and Wilson's Plover. Fargo (1927, p. 566) describes a feeding station of the Fish Crow at Wakulla Beach, where he found, beneath a small pine tree, remains of 79 eggs of the Clapper Rail, 2 of Wilson's Plover, 1 of the Willet, and 7 hen's eggs, several turtle's eggs, a fish head, and a rock crab.

TITMICE: Family Paridae

FLORIDA CHICKADEE: *Penthéstes carolinénsis impiger* (Bangs)

Recognition Marks.—Length, 4.00 to 4.25 inches; tail, 1.95 to 2.30 inches; bill, .28 to .35 inch. Head, nape, and throat black; sides of head white; back between mouse gray and light grayish olive; underparts dull white, washed with pale buff; tail dark mouse gray, without any white.

Range.—Resident in Florida, south at least to Fort Pierce, and in southern Georgia.

Distribution in Florida.—Specimens have been examined from Phillips Inlet (Walton County), Goose Creek (Wakulla County), St. Marks, Branford, Amelia Island, San Mateo, Spruce Creek (near Oak Hill), Tacoma, Richland, Otter Creek, Green Swamp (Polk County), Homosassa, Port Richey, and Fort Kissimmee. The species was observed by Hoxie at Titusville and St. Lucie; H. H. Bailey (1925a, p. 141) reported it from Fort Pierce, and Scott from Tarpon Springs.

Haunts and Habits.—The Florida Chickadee is found in oak hammocks, open pine timber, and on the borders of small cypress swamps. A pair noted on the Kissimmee Prairie was occupying a small palmetto thicket, far from any large timber, a very unusual habitat. The birds are sociable little creatures, found usually in small companies, and often associated, especially in winter, with Tufted Tits and Kinglets. They feed to a considerable extent near the extremities of the branches, sometimes hanging upside down from a tuft of foliage in their search for insects. Although this species resembles the Black-capped Chickadee (*P. atricapillus*) very closely in appearance, its notes are

distinctive, the song consisting of three notes instead of the double-syllabled whistle of the northern bird. The nests are placed in rotten stubs, usually 10 to 15 feet from the ground. Pennock found fresh eggs at St. Marks on April 13, 1914, and April 12, 1915, the set consisting of five eggs in each case. D. J. Nicholson took a set of 4 slightly incubated eggs at Lake Wekiva, April 16, 1911, and noted young birds in a nest at Winter Park, May 3, 1914.

Food.—The food of this species was studied by Beal (1916, pp. 24–26), who examined 210 stomachs. Animal matter composed about 72 per cent, and vegetable matter 28 per cent, of the total contents. Nearly half (44 per cent) of the food for the year consisted of moths and caterpillars. Bugs appeared to be next in favor among the insects, including stink bugs, shield bugs, leaf-hoppers, tree-hoppers, plant lice, and scales. Ants, bees, wasps, beetles, cockroaches, and katydids were consumed in small numbers. Spiders were eaten in considerable numbers, composing more than 10 per cent of the total food. The vegetable food consisted principally of seeds of poison ivy (10 per cent), and of other unidentifiable seeds (12 per cent). A small quantity of blackberries and blueberries was eaten.

TUFTED TITMOUSE: *Baeólophus bícolor* (Linnaeus)

Other Names: **Tomtit; Peter-bird**

Recognition Marks.—Slightly larger than the Solitary Vireo (length, 5.60 to 6.40 inches; spread 9.50 to 10.75 inches; tail, 2.50 to 3.00 inches); *head crested;* bill short. Upperparts and tail neutral gray; forehead with a blackish brown patch; underparts white, the sides washed with cinnamon.

Range.—Resident from Nebraska, Iowa, Illinois, Indiana, Ohio, Pennsylvania, and New Jersey south to central Texas, the Gulf coast, and southern Florida. Casual in Wisconsin, Michigan, New York, and Connecticut.

Distribution in Florida.—A common and generally distributed resident in the northern and central parts, south at least to Collier County. Specimens have been examined from various parts of the State (Amelia Island, Gainesville, Homosassa, Port Richey, Kenansville, Lake Istokpoga, Immokalee, and Lake Trafford), and no characters by which to distinguish a Florida race from the typical form have been found. The species was observed at Rocky Lake (Hendry County), Deep Lake (Collier County), Naples, and Charlotte Harbor, and once at Royal Palm Hammock (October 12, 1917, by Mrs. Hiram Byrd).

Haunts and Habits.—The Tufted Tit is found chiefly in hammocks and around the small cypress swamps that are scattered over much of the open, pine-covered flats in central Florida. Its clear, whistled notes—*péto-péto-péto*—are familiar sounds at all seasons of the year, especially in spring. The birds are not particularly shy, but usually feed well up in the trees and are rather restless, moving about continually from tree to tree. They explore the branches with great thoroughness and often hang head downwards from a horizontal limb in their search for food. The nests are placed in holes 10 to 50 feet above the ground in dead and decaying stubs, chiefly of pine or cypress, and are constructed of leaves, grass, feathers, hair, and cotton. The eggs are usually 5 or 6 in number.

FOOD.—A study in the Biological Survey of the contents of 186 stomachs of this species showed the food to be about two-thirds animal, and one-third vegetable, matter. Caterpillars were found to be a favorite food, comprising 38 per cent of the food of the year. Hymenoptera—bees, wasps, and sawfly larvae—composed 12.5 per cent of the total food, and beetles made up 7 per cent, more than two-thirds of which were snout beetles, or weevils. The cotton-boll weevil was found in four stomachs. Other insects eaten included stink bugs, tree-hoppers, and scale insects. Spiders and a few snails composed the remainder of the animal food. Of the vegetable food, mast (chiefly acorns) formed nearly one-fourth of the total, the remainder consisting of wild fruits, such as elderberries, hackberries, huckleberries, mulberries, and seeds of sumac, poison ivy, and wax myrtle (Beal, McAtee, and Kalmbach, 1916, pp. 26–28).

NUTHATCHES: FAMILY SITTIDAE

SOUTHERN WHITE-BREASTED NUTHATCH: *Sitta carolinensis carolinensis* Latham

RECOGNITION MARKS.—Larger than the Carolina Wren; *bill straight, pointed;* length, 5.00 to 5.50 inches; spread, 9.50 to 10.50 inches; bill, .67 to .77 inch. Head and fore back black, with a greenish gloss; back and rump deep gull gray; underparts ashy white; anal region and under tail coverts auburn; tail fuscous-black, *with large squarish white spots.* (Plate 49.)

RANGE.—Breeds from North Carolina, Tennessee, Kentucky, southern Indiana, southern Illinois, and southeastern Missouri south to southeastern Texas, the Gulf coast, and central Florida.

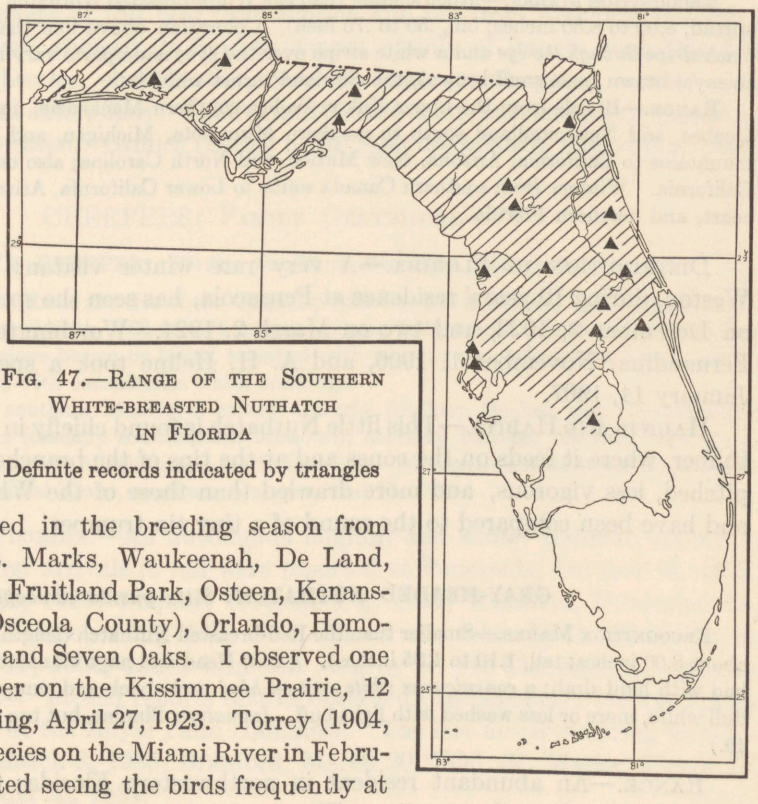

FIG. 47.—RANGE OF THE SOUTHERN WHITE-BREASTED NUTHATCH IN FLORIDA

Definite records indicated by triangles

DISTRIBUTION IN FLORIDA.—A fairly common resident in northern and middle Florida; casual in southern Florida. The species is reported in the breeding season from Whitfield, Chipley, St. Marks, Waukeenah, De Land, Micanopy, Gainesville, Fruitland Park, Osteen, Kenansville, Taylor Creek (Osceola County), Orlando, Homosassa, Tarpon Springs, and Seven Oaks. I observed one bird in open pine timber on the Kissimmee Prairie, 12 miles northeast of Sebring, April 27, 1923. Torrey (1904, p. 123) recorded the species on the Miami River in February, and Mosier reported seeing the birds frequently at Royal Palm Hammock during fall, winter, and spring. Specimens were taken at Lake Arbuckle, March 10, 1895, and 7 miles southwest of Kissimmee, March 17, 1896.

HAUNTS AND HABITS.—The White-breasted Nuthatch is found chiefly in open pine forests, and its nests are said to be placed in pine stubs on tracts that have been cut and burned over. Baynard says the birds breed in Alachua County early in March, but little seems to be known of their breeding habits in Florida. They are sociable and cheerful birds, not particularly shy, making their presence known by their resonant notes, *quank, quank, quank,* in nasal, but not unmusical, tones.

FOOD.—This species feeds extensively upon mast—acorns, hickory nuts, beech nuts, etc.—but the proportion of this food taken has not been computed. Nuts are placed by the birds in crevices of the bark of trees or in cracks of fence rails and hammered with the bill until they are cracked. It is from this habit that the bird gets its common name. It takes other vegetable food as well, such as corn, pine seeds, sunflower seeds, and berries of the Virginia creeper. The animal food consumed includes spiders, beetles, bugs, weevils, ants, flies, moths, caterpillars, and other insects.

RED-BREASTED NUTHATCH: *Sitta canadénsis* Linnaeus

OTHER NAME: Canada Nuthatch

RECOGNITION MARKS.—Much smaller than the White-breasted Nuthatch (length, 4.25 to 4.75 inches; spread, 8.00 to 8.50 inches; bill, .50 to .70 inch). Coloration above like that of *carolinensis; a fuscous-black stripe through the eye* and a white stripe over the eye; underparts varying from dull cinnamon-buff to sayal brown (pale snuff brown), the chin and throat whitish.

RANGE.—Breeds from the upper Yukon Valley, southern Mackenzie, northern Manitoba, northern Quebec, and Newfoundland south to northern Minnesota, Michigan, and Massachusetts, and in the mountains to California, Arizona, New Mexico, and North Carolina; also on Guadalupe Island, Lower California. Winters from southern Canada south to Lower California, Arizona, New Mexico, the Gulf coast, and northern Florida.

DISTRIBUTION IN FLORIDA.—A very rare winter visitant in the northern part. Weston, during 10 years' residence at Pensacola, has seen the species but twice, one bird on December 2, 1923, and two on March 2, 1924. Worthington reported one seen at Fernandina, November 1, 1906, and A. H. Helme took a specimen at Cedar Keys, January 14, 1907.

HAUNTS AND HABITS.—This little Nuthatch is found chiefly in pine or other coniferous timber, where it feeds on the cones and at the tips of the branches. Its notes are higher pitched, less vigorous, and more drawled than those of the White-breasted Nuthatch, and have been compared to the sound of a tiny tin trumpet.

GRAY-HEADED NUTHATCH: *Sitta pusilla cániceps* Bangs

RECOGNITION MARKS.—Smaller than the Red-breasted Nuthatch (length, 3.75 to 4.10 inches; spread, about 8.00 inches; tail, 1.10 to 1.35 inches). *Adult:* Head and nape cinnamon-brown, more or less overlaid with light drab; a *conspicuous white spot on hind neck;* back and rump dark gull gray; underparts dull white, more or less washed with light buff. *Immature:* Similar, but top of head mouse gray. (Plate 49.)

RANGE.—An abundant resident in northwestern Florida; moderately common in the central and southern parts. The species is reported at Pensacola, Whitfield, St. Marks, Cherry Lake, Waukeenah, New Smyrna, Micanopy, Clearwater, Tarpon Springs,

La Belle, Immokalee, Braden River, Okeechobee, Fort Drum, Fort Pierce, Homestead, and Royal Palm Hammock (June). Specimens from Whitfield and Milton are intermediate between *pusilla* and *caniceps*.

HAUNTS AND HABITS.—Gray-headed Nuthatches inhabit the open pine forests of the State, placing their nests in dead stubs or sometimes in fence posts or telephone poles. Weston says of the birds at Pensacola: "Excavating begins in earnest by the middle of February, several holes being started before the final selection of a nesting site is made. Both sexes work industriously, and the nest is apparently completed early in March. Some time seems to elapse before eggs are laid." Eggs were found at Whitfield, March 2, 1903; St. Marks, March 8, 1917; Archer, March 15, 1889, and April 11, 1888; Sebring, April 7, 1923; Turkey Lake, Orange County, April 29, 1917; Seven Oaks, February 18, 1908; and Punta Gorda, April 10, 1923. The number of eggs varies from 4 to 6, and the height of the nest cavity above the ground from 4 to 40 feet.

These Nuthatches are active, restless little creatures, sociable in habit, and are continually carrying on a chattering conversation as they glean from tree to tree in the big pineries. Their notes suggest the syllables *chā-chā-chā* rapidly uttered with strong emphasis.

FOOD.—Eight stomachs of this bird from Florida and ten from Alabama, examined in the Biological Survey, showed its food to consist mainly of insects, including leaf beetles, wood-boring beetles, click beetles, roaches, bugs, grasshoppers, moths, ants, wasps, scale insects, and caterpillars. Spiders and pseudo-scorpions, and small quantities of pine seeds were also eaten. Grimes (1929c, p. 20) says the favorite food is pine mast.

CREEPERS: FAMILY CERTHIIDAE

BROWN CREEPER: *Cérthia familiáris americâna* Bonaparte

RECOGNITION MARKS.—About the size of the Chipping Sparrow, but slenderer, with *long curved bill and long narrow tail feathers* (length, 5.00 to 5.75 inches; spread, 7.00 to 8.00 inches; tail, 2.50 to 3.00 inches). Head and back clove brown or bister, streaked with white; rump ochraceous-tawny; underparts white; wings fuscous, with conspicuous white markings.

RANGE.—Breeds from southern Manitoba, central Ontario, southern Quebec, and Newfoundland south to eastern Nebraska (casually southeastern Missouri), northern Indiana, northern New York, and Massachusetts, and along the Alleghenies to North Carolina. Winters over a large part of its breeding range and south to central Texas, southern Alabama, and Florida.

DISTRIBUTION IN FLORIDA.—An uncommon migrant and winter resident, chiefly in the northern part. First arrivals in fall were reported at Pensacola, October 18, 1929; Tallahassee, October 28, 1904; Chipley, November 2, 1902; Whitfield, November 29, 1902; and St. Marks, November 21, 1913. A specimen was taken by A. H. Helme at Cedar Keys, January 17, 1906, and a bird was seen by F. M. Chapman at Coconut Grove, January 23, 1925. Mosier reports that he observed Creepers every fall and spring while he was stationed at the Royal Palm Hammock. The last noted in spring were recorded at Pensacola, March 8, 1925; Branford, March 20, 1893; St. Marks, March 19, 1917; and Milton, March 23, 1881.

HAUNTS AND HABITS.—The Brown Creeper is a quiet, inconspicuous little bird, spending most of its life creeping in spirals up the trunks and larger limbs of forest trees

in search of its insect food. Reaching a point well up in a tree, it flies to the base of another and begins the ascending spiral again. The birds are not at all shy and pay little attention to an observer, who may approach as close as he will. The notes of the Creeper are a series of high-pitched squeaks that are difficult for many persons to hear.

FOOD.—The food of the California Creeper was studied by Beal, who found that it consisted of small beetles (including weevils), wasps, ants, bugs, caterpillars, and a few spiders. Judd examined one stomach of the eastern bird and found in it beetles, sawflies, flying ants, spiders, and seeds of the scrub pine. The species is doubtless mainly beneficial in its food habits.

WRENS: FAMILY TROGLODYTIDAE

EASTERN HOUSE WREN: *Troglódytes aëdon aëdon* (Vieillot)

RECOGNITION MARKS.—Smaller than Bewick's Wren (length, 4.50 to 5.25 inches; spread, 6.10 to 7.00 inches; tail, 1.75 to 2.00 inches). Upperparts olive-brown, shading to auburn on the rump; underparts dull white, shaded with drab-gray; tail olive-brown, narrowly barred with fuscous; wings hair brown (dark drab), with narrow bars of fuscous and buff. (Plate 50.)

RANGE.—Breeds from eastern Wisconsin, Michigan, central Ontario, southern Quebec, and New Brunswick south to Kentucky and Virginia. Winters in eastern Texas and Tamaulipas, and in the South Atlantic and Gulf States.

DISTRIBUTION IN FLORIDA.—A common winter resident in all parts. Specimens of this race have been examined from Pensacola, Tallahassee, St. Marks, Gainesville, Amelia Island, Jacksonville, New Smyrna, Welaka, Palatka, Tarpon Springs, Fort Myers, Wilson, Eau Gallie, Kissimmee, Merritt Island, Istokpoga Lake, Miami, Royal Palm Hammock, and Cape Sable. A series of 20 specimens from Whitfield (November 22 to March 31) is referable to this race. First arrivals from the North in fall were reported at Pensacola, October 6, 1928; Tallahassee, October 6, 1904; Oxford, September 26, 1920; Orlando, September 27, 1909; Fort Pierce, October 2, 1919; Princeton, October 8, 1916; and Royal Palm Hammock, October 11, 1917. The species is said to be common in winter on Upper Matecumbe Key and Key West. The last seen in spring were noted at Fort Pierce, April 12, 1919; Immokalee, April 15, 1919; Citrus Center, April 22, 1919; Winter Park, April 21, 1902; Daytona Beach, April 19, 1925; Tallahassee, April 16, 1902; and Whitfield, April 17, 1903.

HAUNTS AND HABITS.—This little Wren, well known in the North as a conspicuous inhabitant of orchards and dooryards, loses most of its familiarity while resorting in the South, and during the winter months frequents palmetto thickets and brushy tangles in the hammocks. Here the birds are shy and for the most part quiet, but as spring opens one may occasionally hear snatches of the bubbling song, which on the breeding grounds is a nearly continuous performance.

FOOD.—A study in the Biological Survey of the contents of 68 stomachs of the House Wren showed its food to consist entirely of animal matter, mostly insects. The largest item in the food was bugs (nearly 30 per cent), chiefly stink bugs, a few negro bugs, and some leaf-hoppers. Grasshoppers, crickets, and locusts were eaten in every month, and aggregated nearly 18 per cent of the total food. Beetles constituted about 14 per

cent of the total food, and included leaf beetles, weevils, ladybugs, and predacious ground beetles. Moths and caterpillars were eaten in about the same quantities as the beetles, and ants, bees, and wasps were taken in smaller amounts. Spiders composed more than 10 per cent of the food; and millipeds (thousand-legs), sowbugs, and snails were occasionally eaten (Beal, McAtee, and Kalmbach, 1916, pp. 5–7).

WESTERN HOUSE WREN: *Troglódytes aëdon pârkmani* Audubon

Recognition Marks.—Similar to the eastern race, but paler and grayer, with back and scapulars distinctly barred with fuscous.

Range.—Breeds from southern British Columbia, northern Alberta, central Saskatchewan, and southern Manitoba south to northern Lower California, southern Arizona, southwestern Texas, southern Missouri, and southern Illinois. Winters from California, Texas, southern Alabama, and northwestern Florida south to southern Mexico.

Distribution in Florida.—Apparently a rare winter visitant in northern and central Florida; known at present from 5 specimens, taken as follows: St. Marks, February 9, 1914; Winter Park, October 28 and November 15, 1913; and Whitfield, January 12 and February 20, 1903.

EASTERN WINTER WREN: *Nânnus hiemâlis hiemâlis* (Vieillot)

Recognition Marks.—The smallest of the wrens, with very short tail (length, 3.50 to 4.25 inches; spread, 5.50 to 6.50 inches; tail 1.00 to 1.25 inches). Coloration of upperparts similar to that of the House Wren; underparts dull pinkish buff, *heavily speckled with fuscous*, darkest on the lower belly.

Range.—Breeds from central Alberta, southern Manitoba, northern Ontario, central Quebec, and Newfoundland south to central Minnesota, northern Wisconsin, central Michigan, and Massachusetts, and in the Alleghenies to northern Georgia. Winters from about its southern breeding limit to Texas and central Florida.

Distribution in Florida.—An uncommon winter resident in the northern and central parts, casually farther south. Weston reports it rare at Pensacola. It was observed in small numbers at St. Marks by Pennock, and at Tallahassee by Williams, and a few birds were noted each winter at Orlando by H. W. Ballantine. H. H. Bailey records one shot at Kissimmee, February 22, 1911. The most southerly records are from the Caloosahatchee River, March 5, 1912 (Phelps, 1912, p. 125); Arcadia (Evans, 1923, p. 7); and Chokoloskee, October 7, 1915 (specimen, Ellis, 1915, p. 209). Earliest migrants in fall were noted at Pensacola, October 20, 1929; Chipley, October 22, 1902, and November 4, 1903; and St. Marks, November 5, 1916. The last seen in spring were reported at Orlando, March 10, 1917; lower Suwannee River, March 23, 1890; Marianna, March 22, 1922; Goose Creek (Wakulla County), March 31, 1919; and St. Marks Light, April 3, 1924 (specimen).

Haunts and Habits.—While in the South, these tiny Wrens are found in brushy, deciduous woodland, creeping or flitting silently about over fallen logs and through brush piles in their search for food. Their small size and short tail serve to distinguish them from any of the other wrens in similar habitats.

BEWICK'S WREN: *Thryomânes bewicki bewicki* (Audubon)

RECOGNITION MARKS.—Smaller than the Carolina Wren (length, 5.00 to 5.50 inches; spread, 6.75 to 7.15 inches; tail, 2.10 to 2.40 inches). A white line over the eye; upperparts cinnamon-brown; *underparts grayish white;* tail much rounded, fuscous-black, most of the feathers white-tipped. (Plate 50.)

RANGE.—Breeds from southeastern Nebraska, northern Illinois, southern Michigan, and southern Pennsylvania south to central Arkansas, northern Mississippi, central Alabama, northern Georgia, and the highlands of South Carolina. Winters from near the northern limit of its range south to the Gulf coast and central Florida.

DISTRIBUTION IN FLORIDA.—A winter resident in the northwestern part, casually south to Tampa Bay. It is reported common at Waukeenah (Wayne, 1895, p. 367) and at Tallahassee (R. W. Williams, 1904, p. 461), but other observers record it as rare. First arrivals in fall were noted at Pensacola, October 9, 1920; Chipley, September 24, 1903; and Tallahassee, October 11, 1904. Single individuals were observed at Whitfield, December 17, 1902; Crestview, February 22, 1920; and Garniers, February 23, 1920. The last seen in spring were reported at Pensacola, March 16, 1924; Chipley, March 27, 1903; and Wakulla, March 16, 1918. Pangburn (1919, p. 405) mentions one seen at St. Petersburg, February 27, 1918, and W. G. Fargo one at Indian Rocks (Pinellas County), March 24, 1925.

HAUNTS AND HABITS.—Bewick's Wren lives in the uplands and hills, and is often found about farm buildings. It has a rich and very musical song, suggesting that of the Song Sparrow but with a finer quality. When singing the birds often alight on a telephone wire or the peak of a building. Like all wrens, they are active and restless, the long tail being constantly in motion.

FOOD.—Investigation of the food habits of one of the western forms of Bewick's Wren by Professor Beal (1907, p. 57), showed that 97 per cent of its food consisted of animal matter (chiefly insects) and 3 per cent of vegetable matter. The animal food included bugs (about 31 per cent), beetles (21 per cent), ants (7 per cent), wasps (10 per cent), caterpillars and moths (12 per cent), grasshoppers (4 per cent), flies (6 per cent), and spiders (5 per cent). The food of the eastern subspecies probably does not differ greatly from that of the western. A bird taken in Louisiana in winter had eaten 3 boll weevils.

CAROLINA WREN: *Thryothórus ludoviciánus ludoviciánus* (Latham)

RECOGNITION MARKS.—Length, 5.10 to 6.00 inches; spread, 6.75 to 7.50 inches; bill, .57 to .70 inch, much curved; tail rounded. Upperparts russet or auburn; a white line over the eye, extending back to the shoulders; underparts varying from pale cinnamon-buff to clay color or almost tawny-olive; throat nearly white; wings and tail with fine crossbars of dull fuscous.

RANGE.—Resident in eastern United States from southeastern Nebraska, southern Iowa, Ohio, southern Pennsylvania, and the lower Hudson and Connecticut Valleys south to central Texas, the Gulf States, and northwestern Florida; casual north to Wisconsin, Ontario, and Maine.

DISTRIBUTION IN FLORIDA.—Resident in the northwestern part. Specimens have been examined only from Gonzalez and Milton, but doubtless the subspecies will be found to range eastward at least to the Apalachicola River. Worthington and Todd

(1926, p. 227) record typical birds at Whitfield. A nest with 6 fresh eggs was found in river-bottom timber along the Escambia River near Gonzalez, April 14, 1926.

Food.—The food of the Carolina Wren was studied by Beal (1916, p. 8), who examined 291 stomachs of these birds taken at all seasons of the year, and including many from Florida. This study showed the bird's food to consist of 94.18 per cent animal matter, nearly all insects, and 5.82 per cent vegetable matter, chiefly seeds. Caterpillars and a few moths formed the largest item in the food (21.7 per cent), and bugs amounted to 18.9 per cent. Beetles composed 13.6 per cent of the total food, and included cucumber beetles, the bean-leaf beetle, and the cotton-boll weevil. Grasshoppers and crickets were taken in some numbers (12.5 per cent), and ants and flies in smaller quantities. Spiders appear to be a favorite food, comprising 10.5 per cent of the total. Strangely enough, remains of lizards were found in 14 stomachs, of tree frogs in 8, and of a snake in one. The bulk of the vegetable food consisted of various seeds, including those of bayberry, sweet gum, poison ivy, sumac, pine, oak, and different weeds.

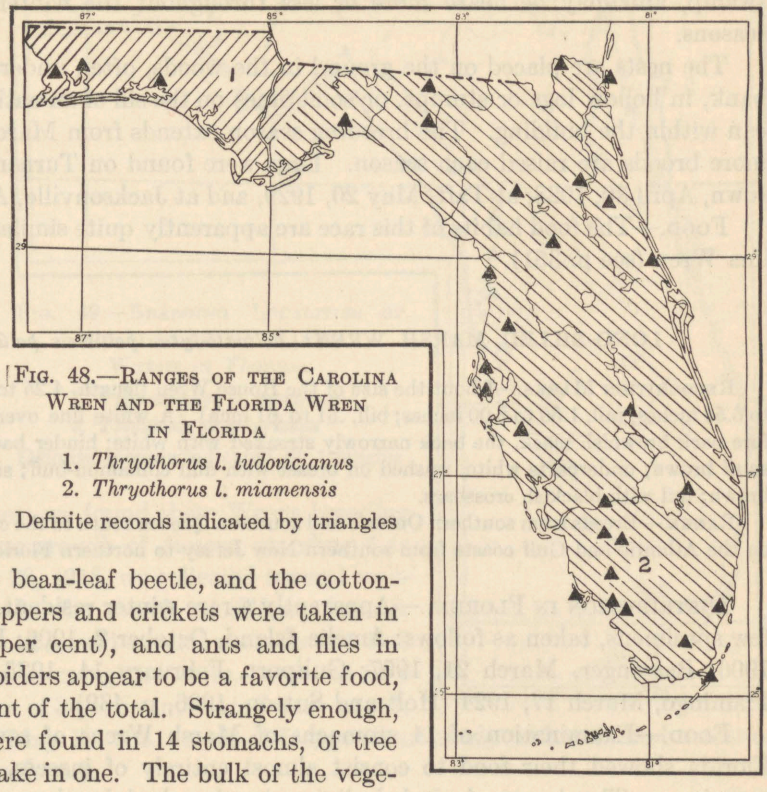

Fig. 48.—Ranges of the Carolina Wren and the Florida Wren in Florida

1. *Thryothorus l. ludovicianus*
2. *Thryothorus l. miamensis*

Definite records indicated by triangles

FLORIDA WREN: *Thryothórus ludoviciánus miamênsis* Ridgway

Recognition Marks.—Larger than the Carolina Wren, with *longer bill* (.63 to .77 inch). Coloration darker both above and below; underparts rich clay color or sayal brown. (Plate 50.)

Range.—Resident in peninsular Florida. Specimens have been examined from St. Marks, Cherry Lake (Madison County), Boulogne, Amelia Island, Day, Gainesville, Silver Spring, Brooksville, Homosassa, New Smyrna, Palatka, and many other places as far south as Key Largo. Those from Gainesville northward are more or less intermediate between *miamensis* and the typical race.

Haunts and Habits.—The Florida Wren has essentially the same habits as its northern relative, the Carolina Wren. The birds live chiefly in dense thickets in the hammocks, swamps, or river bottoms, seeking their food on the ground and about decay-

ing logs. They are usually very shy, and on being alarmed dive into the depths of the thicket, voicing their annoyance by occasional scolding *churrs* or *cacks*. The song of these Wrens is a cheery, voluble, rollicking performance, subject to much variation, but usually rendered in triplets. It is delivered from a low perch in the thicket or swamp, and may be heard more or less throughout the winter, as well as at other seasons.

The nests are placed on the ground in the woods, often underneath an overhanging bank, in hollow logs or stumps, or sometimes on the sill of an outbuilding, or in a box or can within the building. The breeding season extends from March to July, and two or more broods are raised each season. Eggs were found on Turners River, near Carnestown, April 30, 1928, at Taft, May 20, 1929, and at Jacksonville, April 23, 1930.

Food.—The food habits of this race are apparently quite similar to those of the Carolina Wren (see p. 351).

LONG-BILLED MARSH WREN: *Telmatódytes palústris palústris* (Wilson)

Recognition Marks.—About the size of the House Wren (length, 4.25 to 5.25 inches; spread, 5.00 to 6.50 inches; tail, 1.50 to 2.00 inches; bill, .51 to .61 inch). A white line over the eye; head, nape, and fore back brownish black, the back narrowly streaked with white; hinder back and upper tail coverts snuff brown; underparts white, washed on breast with dull cinnamon-buff; sides and flanks pale snuff brown; tail with blackish crossbars.

Range.—Breeds from southern Ontario and southern Quebec south to the coast of Virginia. Winters on the Atlantic and Gulf coasts from southern New Jersey to northern Florida.

Distribution in Florida.—Apparently a rare winter resident. Known from only a few specimens, taken as follows: Amelia Island, October 2, 1906; Lukens, December 26, 1906; Bassenger, March 21, 1907; Gulfport, February 14, 1925 (W. G. Fargo); and Flamingo, March 17, 1924 (Holt and Sutton, 1926, p. 439).

Food.—Examination of 11 stomachs of Marsh Wrens of several subspecies from Florida showed their food to consist almost entirely of insects, spiders, and pseudoscorpions. The insects included diving beetles, leaf beetles, click beetles, weevils, water bugs, ants, wasps, moths, dragon flies, and damsel flies.

MARIAN'S MARSH WREN: *Telmatódytes palústris mariánae* (Scott)

Recognition Marks.—Similar to *palustris*, but *smaller* and *darker;* upperparts chiefly dark cinnamon-brown, the head clove brown or black; white streaks on back of less extent; *breast usually shaded or speckled with drab;* sides and flanks olive-brown or sepia. (Plate 50.)

Range.—Resident locally on the Gulf coast from Alabama eastward and south to Tampa Bay and Charlotte Harbor.

Distribution in Florida.—An abundant resident on the Gulf coast from St. Marks south to Old Tampa Bay. Specimens have been examined from Pensacola (October 30, 1927), Whitfield (April 18, 1903), St. Marks, Pinhook, Fenholloway River, Pepperfish Keys, Rock Island, Cedar Keys, Chassahowitzka Bay, Port Richey, Tarpon Springs, Seven Oaks, and Charlotte Harbor (February 9 and April 13). Marsh Wrens are not

known to breed at Pensacola, and we found no breeding colonies from that point eastward until we reached St. Marks; from there southward they are abundant in suitable marshes as far as Tarpon Springs. Pennock reported a few birds seen in Charlotte Harbor, April 11 and 13, 1921, at which time he took a specimen and observed a nearly completed nest.

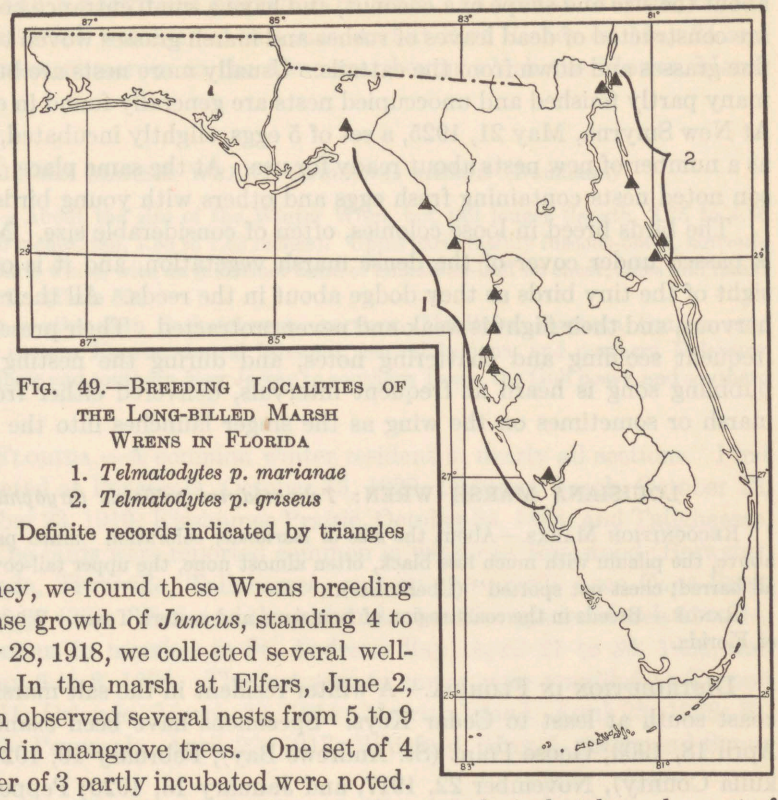

FIG. 49.—BREEDING LOCALITIES OF THE LONG-BILLED MARSH WRENS IN FLORIDA

1. *Telmatodytes p. marianae*
2. *Telmatodytes p. griseus*

Definite records indicated by triangles

HAUNTS AND HABITS.—Closely similar to those of the Atlantic coast races. In the extensive salt marshes at the mouth of Pithlachascotee River, near Port Richey, we found these Wrens breeding commonly in the dense growth of *Juncus*, standing 4 to 5 feet high. On May 28, 1918, we collected several well-grown young birds. In the marsh at Elfers, June 2, 1919, D. J. Nicholson observed several nests from 5 to 9 feet above the ground in mangrove trees. One set of 4 fresh eggs and another of 3 partly incubated were noted. In the same locality, May 10, 1931, a set of 5 eggs about ready to hatch, and a nest of feathered young, were found.

WORTHINGTON'S MARSH WREN: *Telmatódytes palústris griseus* (Brewster)

RECOGNITION MARKS.—Similar in size to *marianae*, but much paler and more grayish; upperparts mainly hair brown (dark drab), the head somewhat darker; white streaks on back much restricted; underparts faintly washed or speckled with mouse gray. (Plate 50.)

RANGE.—Atlantic coast region from South Carolina to northern Florida.

DISTRIBUTION IN FLORIDA.—Occurs in the salt marshes on the northeastern coast from Amelia Island south at least to New Smyrna. There are large colonies of this subspecies on Amelia Island, in the Nassau and Matanzas River marshes, and in Halifax River near Ponce Park and New Smyrna. The birds have not been noted on Merritt Island but may occur there. Although apparently nonmigratory, these Marsh Wrens appear to be less numerous during the winter than in summer, but this may be due to their habit of remaining concealed during the nonbreeding season.

HAUNTS AND HABITS.—Worthington's Marsh Wren has the same habits as have the other Atlantic coast races. The birds live in the wettest and boggiest parts of the salt

marshes, chiefly on the borders of the tidal creeks, where their nests are fastened to the growing stems of the rushes, at a height of 2 or 3 feet above the water. The nests are about the size and shape of a coconut, and have a small entrance hole on one side. They are constructed of dead leaves of rushes and marsh grasses woven together and lined with fine grasses and down from the cattails. Usually more nests are built than are used, and many partly finished and unoccupied nests are generally found in every breeding colony. At New Smyrna, May 21, 1925, a set of 5 eggs, slightly incubated, was observed, as well as a number of new nests about ready for use. At the same place, May 28, 1926, Nicholson noted nests containing fresh eggs and others with young birds.

The birds breed in loose colonies, often of considerable size. Most of their existence is passed under cover of the dense marsh vegetation, and it is often difficult to catch sight of the tiny birds as they dodge about in the reeds. All their actions are quick and nervous, and their flight is weak and never protracted. Their presence is made known by frequent scolding and chattering notes, and during the nesting season their curious bubbling song is heard at frequent intervals, delivered either from the depths of the marsh or sometimes on the wing as the singer launches into the air for a short flight.

LOUISIANA MARSH WREN: *Telmatódytes palústris thryóphilus* Oberholser

RECOGNITION MARKS.—About the size of *marianae;* coloration "much paler, more grayish brown above, the pileum with much less black, often almost none, the upper tail-coverts obsoletely or not at all barred; chest not spotted" (Oberholser).

RANGE.—Breeds in the coast region of Louisiana and eastern Texas. Winters east to the west coast of Florida.

DISTRIBUTION IN FLORIDA.—A winter resident in the salt marshes of the upper Gulf coast south at least to Cedar Keys. Specimens have been examined from Whitfield, April 18, 1903; Goose Point (St. Andrews Bay), February 10, 1920; Goose Creek (Wakulla County), November 22, 1917, and January 13, 1920; Pepperfish Keys, March 9, 1907; Cedar Keys, January and February (5 specimens); and Lukens, December (6 specimens).

PRAIRIE MARSH WREN: *Telmatódytes palústris iliacus* Ridgway

RECOGNITION MARKS.—Similar to the northeastern race (*palustris*), but slightly larger and coloration of upperparts paler, with less black on the back. (Plate 50.)

RANGE.—Breeds on the plains and prairies from central Alberta and central Manitoba south to Missouri and Indiana. Winters along the Gulf coast and in peninsular Florida to Cape Sable, and south through Mexico to Vera Cruz.

DISTRIBUTION IN FLORIDA.—A common migrant and winter resident, chiefly on the Gulf coast. Specimens have been examined from Whitfield, March 17; Santa Rosa Island, April 16; Apalachicola, May 8; St. Andrews Bay, February 10; Goose Creek (Wakulla County), November 22, 1917, and January 13, 1920; Aucilla River, May 16, 1926; Amelia Island, May 19 and October 16, 1906, and April 25 and May 9, 1918; Daytona Beach, May 13, 1926; Cedar Keys, December, January, and February; Sumner, March 9; Zellwood, April 4, 1923; Lake Trafford, February; St. Johns marshes, south of Deer Park, May 1, 1925; Port Richey, May 25, 1918; Seven Oaks, April 20; Tarpon

Springs, January, February, and March; Royal Palm Hammock, January 29, 1918; and Cape Sable, February 13 and March 31. The dates just given indicate a southward migration in October and a northward migration in May. As late as May 16, on the Aucilla River, we found small numbers of this race, and at Port Richey on May 24 and 25, 1918, these birds were numerous in the same marshes in which the Marian Marsh Wrens were nesting.

SHORT-BILLED MARSH WREN: *Cistothórus stellâris* (Naumann)

RECOGNITION MARKS.—About the size of the Winter Wren, but tail longer (length, 3.75 to 4.50 inches; spread, 5.25 to 6.00 inches; tail, 1.38 to 1.63 inches). Upperparts mainly fuscous-black, *narrowly streaked with white;* underparts white, with an indistinct band of cinnamon-buff on chest; sides and flanks cinnamon or cinnamon-buff. (Plate 50.)

RANGE.—Breeds from southeastern Saskatchewan, northern Manitoba, southern Ontario, and southern Maine south to eastern Kansas, central Missouri, central Indiana, and northern Delaware. Winters from southern Illinois and southern New Jersey to southern Texas, the Gulf coast, and southern Florida.

DISTRIBUTION IN FLORIDA.—A common winter resident in nearly all sections. First arrivals in fall were noted at Pensacola, October 15, 1929; Daytona Beach, October 22, 1924; St. Marks, October 23, 1919; Kissimmee Prairie, October 24, 1888; and Tallahassee, November 9, 1901. The birds were reported common in winter at Rosewood (Brewster, 1882b, p. 121), Orlando, Titusville, Tallahassee, and on the prairie near Cape Sable (Holt and Sutton, 1926, p. 439). We found them abundant at Everglade, March 11 to 14, 1919, and fairly numerous in marshes in St. Andrews Bay, April 27 to 30, 1926, and Apalachicola Bay, May 6 to 8, 1926. The last seen in spring were recorded at Tarpon Springs, April 15, 1891; Orlando, March 30, 1914; Merritt Island, April 25, 1928; St. Marks, April 21, 1917; Pensacola, April 22, 1917; Whitfield, May 5, 1903; and Seven Oaks, May 8, 1913.

HAUNTS AND HABITS.—The Short-billed Marsh Wren, during the winter season in Florida, is found in marshes, both fresh and salt, and in old fields or prairies where there is a growth of dense, matted grass or weeds. The birds remain hidden in the vegetation most of the time, but are easily flushed by walking toward them, when they fly weakly for a short distance and drop again into the grass. At times I have heard them chattering in the marsh grass, or rarely singing a little.

FOOD.—Examination of 34 stomachs of this Wren from Florida showed its food to consist wholly of insects and spiders. The insects taken included ants, bugs, weevils, ladybird beetles, moths, caterpillars, locusts, crickets, and grasshoppers.

THRASHERS AND MOCKINGBIRDS: FAMILY MIMIDAE

EASTERN MOCKINGBIRD: *Mímus polyglóttos polyglóttos* (Linnaeus)

RECOGNITION MARKS.—Resembles the Shrike in flight, but the tail is longer, wing spread greater, and bill slenderer. Length, 9.50 to 11.00 inches; spread, 13.00 to 15.00 inches; tail, 4.25 to 5.25 inches. Upperparts hair brown (dark drab); underparts white, washed with pale smoke gray; wings and tail fuscous, *with conspicuous white patches.* (Plate 48.)

RANGE.—Southeastern United States from eastern Nebraska, southern Iowa, Illinois, Indiana, Ohio, and Maryland south to eastern Texas, the Gulf coast, and the Bahamas; north sparingly to New York and Massachusetts. Accidental in Wisconsin, Ontario, Maine, and Nova Scotia; introduced in Bermuda.

DISTRIBUTION IN FLORIDA.—An abundant resident in all parts of the State; less numerous in the extreme southern part and in unsettled sections. Maynard (1881, p. 17) reported the birds abundant at Key West in winter, but Atkins considers them rare there in the breeding season (Scott, 1890a, p. 115). They have been recorded also from Key Largo, Key Vacas, the Tortugas (May 14, 1922), Upper Matecumbe, Boca Chica, Summerland, Cudjoe, and Indian Keys. We found them in moderate numbers on the Kissimmee Prairie, on the prairies and in the open pine forests in Lee and Hendry Counties, and in the dense hammocks at Cape Sable.

HAUNTS AND HABITS.—The Mockingbird is probably the most widely distributed and best known bird in Florida. It is partial to cultivated lands, orange groves, village gardens, and dooryards where shrubbery abounds, but may often be found nesting in the wilderness, miles from any habitation. The nests are placed in small trees, bushes, thickets, or sometimes in a hanging bunch of Spanish moss. D. J. Nicholson reports finding a nest in a Spanish bayonet (yucca) on a sand ridge within 150 feet of the ocean.

The song of the Mocker is easily the most prominent and best loved of southern bird voices—a cheery, rollicking, voluble medley of great variety, interspersed with excellent imitations of many other birds' songs or call notes. The birds are silent for the most part during midwinter, except for their harsh *chuck*, but with the approach of spring, usually late in January or early in February, they begin to sing, and keep up the chorus more or less throughout the summer. Early morning is the favorite time for singing, but the inspiration often comes during moonlight nights as well as at midday or in the evening. Nesting begins in March and continues until August, two or more broods being reared. A nest examined at Sebring, March 19, 1923, contained two fresh eggs; and one at Lake Gentry, April 26, 1925, held 4 eggs. Weston reports a nest at Pensacola in which the eggs hatched on March 20, 1927. Grimes (1931, p. 84) reports a nest with 3 fresh eggs near Jacksonville, August 12, 1930.

FOOD.—The food of the Mockingbird consists mainly of wild fruits and berries, with a small percentage of insects and spiders. The insects eaten include ants, caterpillars, beetles, and grasshoppers. The vegetable food comprises the seeds or berries of sumac, poison ivy, Virginia creeper, red cedar, black alder, smilax, pokeberry, mulberry, and bayberry (Judd, 1896, p. 416). Maynard (1881, p. 17) states that on the island of Key West, in fall and winter, Mockingbirds feed extensively on the fruit of the prickly pear (*Opuntia*). He mentions, also, oranges and palmetto berries as forming a part of the Mocker's diet, and other observers include figs and grapes among the fruits eaten, but the extent of damage done to cultivated fruits has not been thoroughly investigated. H. H. Bailey (1925a, p. 135) says that these birds eat quantities of the fruit of the wild fig and the sea grape (*Coccolobis*). Dr. Charles T. Simpson informs me that the Mockingbirds on his place at Lemon City feed on the berries of *Solanum seaforthianum*, and as a result become intoxicated. Nicholson has found the birds feeding extensively on pokeberries, elderberries, myrtle berries (*Myrica cerifera*), gall berries (*Ilex glabra*), French mul-

berries (*Callicarpa*), cabbage-palm berries, and the fruit of the nightshade (*Solanum nigrum*).

CATBIRD: *Dumetélla carolinénsis* (Linnaeus)

OTHER NAME: Black Mockingbird

RECOGNITION MARKS.—Length, 8.25 to 9.00 inches; spread, 11.00 to 12.00 inches. Crown blackish brown; upperparts slate-gray; underparts light neutral gray; *under tail coverts bay;* tail black.

RANGE.—Breeds from central British Columbia, central Alberta, central Saskatchewan, southern Manitoba, central Ontario, southern Quebec, and Nova Scotia south to Oregon, Utah, New Mexico, eastern Texas, central Alabama, central Georgia, and central Florida. Winters from South Carolina (casually farther north) and southern Alabama to the Bahamas and Cuba, and through Mexico to Panama.

DISTRIBUTION IN FLORIDA.—An abundant migrant in spring and fall, and a fairly common winter resident; breeds sparingly in northern and central Florida. A nest was found at Whitfield on May 9, 1903 (Worthington and Todd, 1926, p. 227). Baynard (1913a, p. 247) reports the species as a rare breeder in Alachua County, nesting about April 15; he says also it breeds at Clearwater and on the Blackwater River, near Crystal Springs. Near Dade City, April 13, 1930, he found a pair of these birds nesting in a clump of myrtle bushes. Wayne (1895, p. 365) records the species as a breeder at Waukeenah. H. L. Ferguson states that he once found a nest of this bird on the Chassahowitzka River. At Sebring, April 25, 1923, we saw 3 pairs that seemed to be located for the season. The species was observed, also, at Wekiva Spring, April 27, 1919; Fort Kissimmee, April 27, 1923; Sarasota, April 16, 1925; and Illahaw, April 30, 1925; but there is a possibility that these birds were migrants. Nehrling (1906, p. 16), who lived for years at Gotha, says that the Catbird rarely left that locality in spring before May 9.

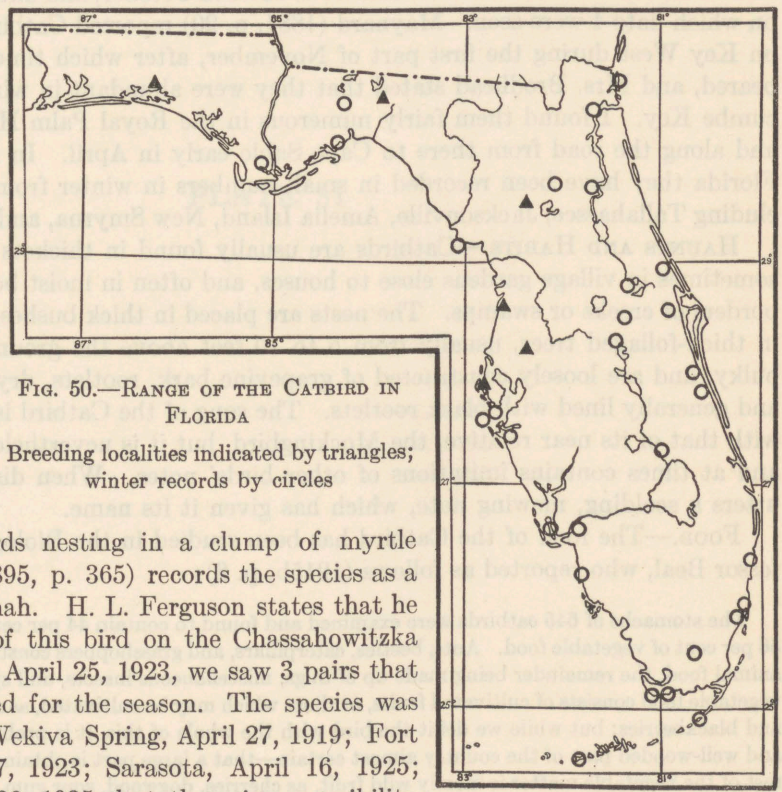

FIG. 50.—RANGE OF THE CATBIRD IN FLORIDA

Breeding localities indicated by triangles; winter records by circles

Spring migration begins very early, as indicated by the record of 25 birds seen at Sombrero Key, on the night of January 26, 1886, flying north. Two were seen there on January 28, but no more until March 9, 1886, when one was seen; the only other spring

records on that key were on April 15 and 18, 1888, when single individuals were noted. One bird struck the light at Fowey Rocks, April 15, 1902, and 11 were counted there on April 20, 1888. Catbirds have been observed in numbers on the Tortugas between April 21 and May 22, and two individuals were reported by Atkins at Key West, May 25, 1889, apparently belated migrants (Scott, 1890a, p. 115). The last migrants noted in spring were recorded at Turner's River (Collier County), May 1, 1930; Fakahatchee River, May 10, 1919; Daytona Beach, May 16, 1926; Amelia Island, May 5, 1923; and Pensacola, May 9, 1926.

Fall migration is indicated by the appearance of the first birds at Pensacola, September 15, 1918, and September 17, 1916; Gotha, September 17 (1905?); Orlando, September 21, 1911, and October 3, 1909; Fort Pierce, September 30, 1918; Princeton, October 2, 1917; and Daytona Beach, September 30, 1923. The first migrants in fall on Sombrero Key were noted on October 13, 1885, and October 24, 1886 (single birds); small numbers were recorded on numerous dates in October, and until December 1 (1888), on which date 4 were seen. Maynard (1881, p. 20) reported Catbirds as very abundant on Key West during the first part of November, after which time the majority disappeared, and Mrs. Brodhead stated that they were abundant in winter on Upper Matecumbe Key. I found them fairly numerous in the Royal Palm Hammock in January, and along the road from there to Cape Sable early in April. In northern and central Florida they have been recorded in small numbers in winter from many localities, including Tallahassee, Jacksonville, Amelia Island, New Smyrna, and Orlando.

Haunts and Habits.—Catbirds are usually found in thickets or dense shrubbery, sometimes in village gardens close to houses, and often in moist bottomlands or on the borders of creeks or swamps. The nests are placed in thick bushes, vines, or sometimes in thick-foliaged trees, usually from 5 to 10 feet above the ground. They are rather bulky, and are loosely constructed of grapevine bark, rootlets, dry leaves, and grasses, and generally lined with black rootlets. The song of the Catbird is not to be compared with that of its near relative, the Mockingbird, but it is nevertheless sweet and varied, and at times contains imitations of other birds' notes. When disturbed, the Catbird utters a scolding, mewing note, which has given it its name.

Food.—The food of the Catbird has been studied in the Biological Survey by Professor Beal, who reported as follows (1915b, p. 8):

> The stomachs of 645 catbirds were examined and found to contain 44 per cent of animal (insect) and 56 per cent of vegetable food. Ants, beetles, caterpillars, and grasshoppers constitute three-fourths of the animal food, the remainder being made up of bugs, miscellaneous insects, and spiders. One-third of the vegetable food consists of cultivated fruits, or those which may be cultivated, as strawberries, raspberries, and blackberries; but while we debit the bird with the whole of this, it is probable—and in the eastern and well-wooded part of the country almost certain—that a large part is obtained from wild vines. The rest of the vegetable matter is mostly wild fruit, as cherries, dogwood, sour gum, elderberries, greenbrier, spiceberries, black alder, sumac, and poison ivy. Although the catbird sometimes does considerable harm by destroying small fruit, it can not on the whole be considered injurious. On the contrary, in most parts of the country it does far more good than harm.

Nehrling (1906, p. 16) says the Catbirds in central Florida feed all winter on pokeberries; Baker (1890, p. 270) found seeds of the saw palmetto in stomachs examined at

PLATE 51

EXPLANATION OF PLATE 51

THRUSHES AND WATER-THRUSHES

The two upper figures are: Olive-backed Thrush (left) and Gray-cheeked Thrush (right); the middle figure is a Wood Thrush and below it is a Hermit Thrush. The two lower figures are: Northern Water-Thrush (left) and Louisiana Water-Thrush (right).

F. L. JAQUES

Micco; and D. J. Nicholson observed the birds at Key West feeding on balsam apples and Barbados cherries.

BROWN THRASHER: *Toxóstoma rúfum* (Linnaeus)

OTHER NAMES: **Brown Thrush; Sandy Mocker**

RECOGNITION MARKS.—Larger than the Mockingbird (length, 10.25 to 11.50 inches; spread, 12.50 to 14.00 inches; tail, 4.50 to 5.50 inches). Upperparts and tail mikado brown (reddish brown); underparts white or buffy white, the breast and sides broadly streaked with fuscous; wings mikado brown, the tips of primaries hair brown (dark drab).

RANGE.—Breeds from southern Alberta, southern Manitoba, northern Michigan, southern Ontario, southern Quebec, and northern Maine south to eastern Louisiana, the Gulf coast, and central Florida. Winters from southeastern Missouri and North Carolina to south central Texas and central Florida.

DISTRIBUTION IN FLORIDA.—A common resident in the northern part, breeding in moderate numbers south to Kissimmee and Bradenton (rarely to Estero and Miami), and wintering south to Bassenger, Fort Myers (1, December 8, 1891), Miakka River, and Deep Lake (1, March 24, 1919). Breeding records are at hand from Bunnell, Gainesville, Micanopy, Orange Park, Fruitland Park, Dade City, Eustis, Gotha, Orlando, Kissimmee, Bradenton, Ozona, and other places in northern Florida. Specimens taken at Lake George, March 17, 1886, and at Fort Gardner, Kissimmee River, March 12, 1901, probably were breeding birds. A nest with young found at Miami, May 22, 1931, by T. D. Burleigh, furnishes the most southern breeding record known. The species is much more numerous in winter than in summer, but there are few migration dates available. The first fall migrants were reported at Daytona Beach, September 30, 1923; Gotha, October 5; Punta Rassa, October 10, 1886; and Palma Sola, October 12, 1920.

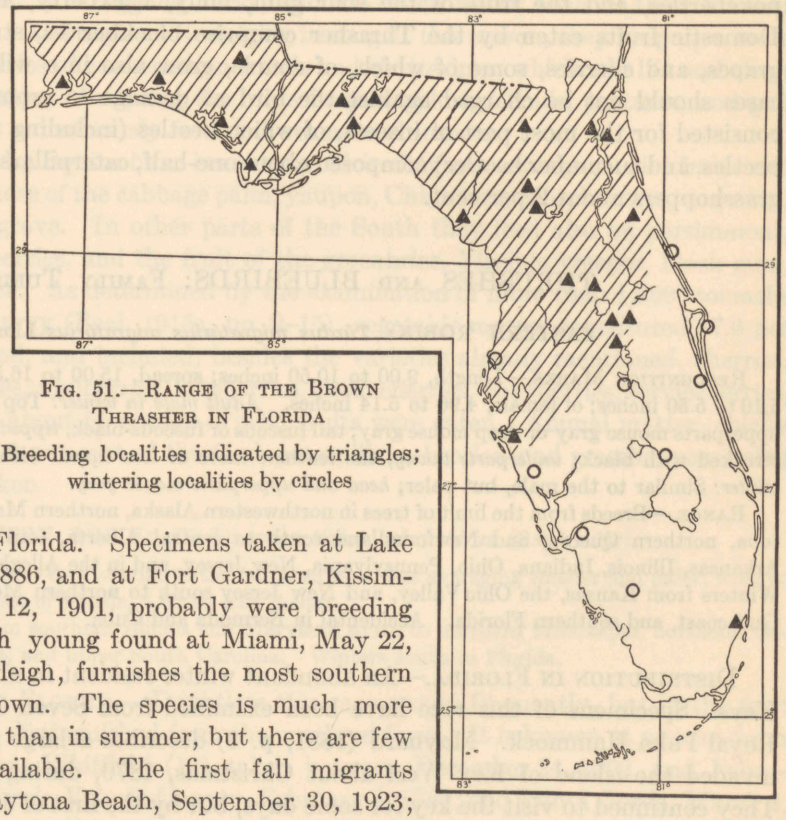

FIG. 51.—RANGE OF THE BROWN THRASHER IN FLORIDA

Breeding localities indicated by triangles; wintering localities by circles

HAUNTS AND HABITS.—The Brown Thrasher frequents dense thickets, brier patches, hedgerows, and open woodland. In the North, the birds are commonly found about farm lands, and in Florida they have been reported nesting in dooryards, gardens, and

orange groves. Nicholson found a number of nests at Orlando in oak and orange trees, 8 to 20 feet above the ground. Fresh eggs were taken there, March 25, April 6, May 3, May 26, and June 14. Pennock noted fresh eggs at St. Marks, April 14, June 26, and July 8, and Weston reported eggs at Pensacola, March 30 and July 4.

The song of the Thrasher is a rich, musical medley, less spectacular than the performance of its cousin, the Mockingbird, but considerably varied and delivered with much feeling and animation from the topmost branch of some tall tree. The alarm note is a sharp, smacking *tchat* that suggests the click of a pair of hedge shears.

Food.—The food of the Brown Thrasher, as shown by a study of 636 stomachs in the Biological Survey, is composed of both vegetable and animal matter, the vegetable matter comprising about 64 per cent, and the animal matter about 36 per cent, of the total food (Beal, 1915b, p. 7). Mast, chiefly acorns, constituted nearly one-fourth (23.7 per cent) of the food of the year, wild fruit formed about one-fifth, and cultivated fruit about 12 per cent. The wild fruits eaten included huckleberries, elderberries, pokeberries, and the fruit of the sour gum, holly, hackberry, and Virginia creeper. Domestic fruits eaten by the Thrasher comprise blackberries, strawberries, currants, grapes, and cherries, some of which, of course, grow also in a wild state, and in such cases should not be charged against the bird as damage to crops. The animal food consisted for the most part of insects, of which beetles (including the boll weevil, May beetles, and cucumber beetles) composed about one-half, caterpillars about 6 per cent, and grasshoppers about 2 per cent.

THRUSHES and BLUEBIRDS: Family Turdidae

EASTERN ROBIN: *Túrdus migratórius migratórius* Linnaeus

Recognition Marks.—Length, 9.00 to 10.50 inches; spread, 15.00 to 16.50 inches; wing of male, 5.10 to 5.50 inches; of female, 4.96 to 5.14 inches. *Adult male in winter:* Top and sides of head black; upperparts mouse gray or deep mouse gray; tail fuscous or fuscous-black, *tipped with white;* throat white, streaked with black; *underparts tawny,* the feathers more or less tipped with white. *Adult female in winter:* Similar to the male, but paler; *head and upperparts mouse gray.*

Range.—Breeds from the limit of trees in northwestern Alaska, northern Mackenzie, northern Manitoba, northern Quebec, and Newfoundland south to central Alberta, southern Wyoming, Kansas, Arkansas, Illinois, Indiana, Ohio, Pennsylvania, New Jersey, and in the Alleghenies to North Carolina. Winters from Kansas, the Ohio Valley, and New Jersey south to northern Mexico (Nuevo Leon), the Gulf coast, and southern Florida. Accidental in Bermuda and Cuba.

Distribution in Florida.—An abundant winter resident in all parts, including the Keys. Specimens of this race have been examined from Seven Oaks, Okeelanta, and Royal Palm Hammock. Maynard (1881, p. 3) describes a large flight of Robins that invaded the island of Key West about Christmas, 1870, during a strong "norther." They continued to visit the key for some days, but by the first of January all had disappeared as suddenly as they had come. Some flocks were seen ascending high in air, apparently headed toward Cuba. In January, 1928, at Pass-a-Grille, on Long Key, W. G. Fargo reported the birds swarming all over the island and roosting in the mangroves; on the 19th he made an estimate of their numbers, which he placed at 11,000.

First arrivals in fall were noted at Pensacola, November 4, 1923; Chipley, October 4, 1903; De Funiak Springs, October 27, 1908; Tallahassee, October 10, 1904; St. Marks, October 21, 1917; Sumner, November 4, 1921; Oxford, November 7, 1920; Canaveral, November 4, 1889; and Arcadia, November 7, 1920. The birds were moderately common in January, 1918, at Royal Palm Hammock and in the near-by pineland on Long Key, but none were seen at Cape Sable. Mrs. Brodhead reported them wintering on Upper Matecumbe Key in 1910. The last observed in spring were recorded at Fort Myers, March 26, 1920; Palma Sola, April 11, 1912; Hastings, April 6, 1918; Orlando, March 27, 1915; Orange County, May 3, 1910; Deland, March 25, 1915; Gainesville, April 27, 1887; St. Marks, March 30, 1917; and Pensacola, April 2, 1919.

HAUNTS AND HABITS.—Robins, as winter visitants in Florida, vary in abundance from year to year, depending probably on the food supply in the various regions that they visit. During the winter of 1927–28 these birds were reported in very large numbers all over the State, frequenting hammocks, pinelands, timbered swamps, prairies, and coastal beaches. They occur in straggling flocks, and are much wilder than in their summer homes in the North. Although not indulging in song at this season, they keep up a more or less continuous series of conversational calls and chatterings, which add life and cheer to the winter landscape. In spring the birds frequent plowed lands, pastures, and golf courses, and search industriously for earthworms and insects.

FOOD.—In Florida, Robins have been reported feeding extensively on wild fruits and berries, especially those of the cabbage palm, yaupon, China tree, camphor tree, dogwood, gallberry, and mangrove. In other parts of the South they feed also on persimmons, hackberries, holly berries, and the fruit of the greenbrier, Virginia creeper, black gum, red cedar, and sumac. As determined by the examination of more than 1,200 stomachs in the Biological Survey (Beal, 1915a, pp. 2–15), vegetable matter constituted 57.6 per cent of the total food, and included, besides the varieties already mentioned, cherries, currants, blackberries, mulberries, blueberries, chokecherries, pokeberries, serviceberries, and grapes. In all, about 65 species of wild fruits were eaten. Animal matter, chiefly insects, made up 42.4 per cent of the food, caterpillars, beetles, and grasshoppers being most frequently taken.

SOUTHERN ROBIN: *Túrdus migratórius achrústerus* (Batchelder)

RECOGNITION MARKS.—Very similar to the northern race, but averaging smaller and paler; wing of male, 4.69 to 4.88 inches; of female, 4.63 to 4.98 inches.

RANGE.—Breeds from southern Illinois and Maryland south to northern Mississippi, northern Alabama, northern Georgia, and upper South Carolina. Winters south to Florida.

DISTRIBUTION IN FLORIDA.—Doubtless this race occurs frequently, but in the field the birds can not be distinguished from the northern form. It is known at present from specimens, as follows: Whitfield (12), taken between December 24, 1902, and February 26, 1903; Cow Creek, Volusia County, February 8, 1889; and Punta Gorda, March 2, 1921.

WOOD THRUSH: *Hylocichla mustelina* (Gmelin)

RECOGNITION MARKS.—The largest of the thrushes of this genus; body about the size of the Brown Thrasher, but bill and tail shorter (length, 7.50 to 8.25 inches; spread, 13.00 to 14.00 inches; tail, 2.85 to

3.25 inches). *Head more reddish than the rump and tail;* top of head and nape ochraceous-tawny; back sayal brown (pale snuff brown); rump and upper tail coverts grayish olive; tail light olive-brown; underparts white, the breast and sides with large roundish clove brown spots. (Plate 51.)

RANGE.—Breeds from southern South Dakota, central Minnesota, central Wisconsin, southern Ontario, Vermont, and New Hampshire south to eastern Texas, Louisiana, southern Alabama, and northern Florida. Winters from southern Mexico to Costa Rica (casually in Florida). Occurs in migration in the Bahamas, Cuba, and Jamaica.

DISTRIBUTION IN FLORIDA.—A rare migrant and summer resident in the northern part; a fairly common migrant in spring in central Florida and on the Keys. Wintering individuals were recorded at New Smyrna, February 11, 1913; Whitfield, December 25, 1902, and January 13, 1903 (Worthington and Todd, 1926, p. 229); and Warrington, March 18, 1918 (Helmuth, 1920, p. 258). Earliest migrants in spring were reported at Key West, March 13, 1890; Jacksonville, April 5; Egmont Key, April 19, 1910 (20 birds); Old Town, April 24, 1893; De Funiak Springs, April 10, 1909; and Pensacola, April 1, 1923, and April 2, 1926. The last noted in spring at Key West was observed on May 3, 1888. The species breeds sparingly in Escambia and Leon Counties, and at Whitfield, Chattahoochee, De Funiak Springs, Chipley, Waukeenah, Cherry Lake, Boulogne, Jacksonville, Orange Park, Middleburg, and Bostwick. The last seen in fall were recorded at Pensacola, October 14, 1928; De Funiak Springs, October 9, 1908; Tallahassee, October 14, 1911; Orlando, October 8, 1911; and Daytona Beach, October 12, 1925.

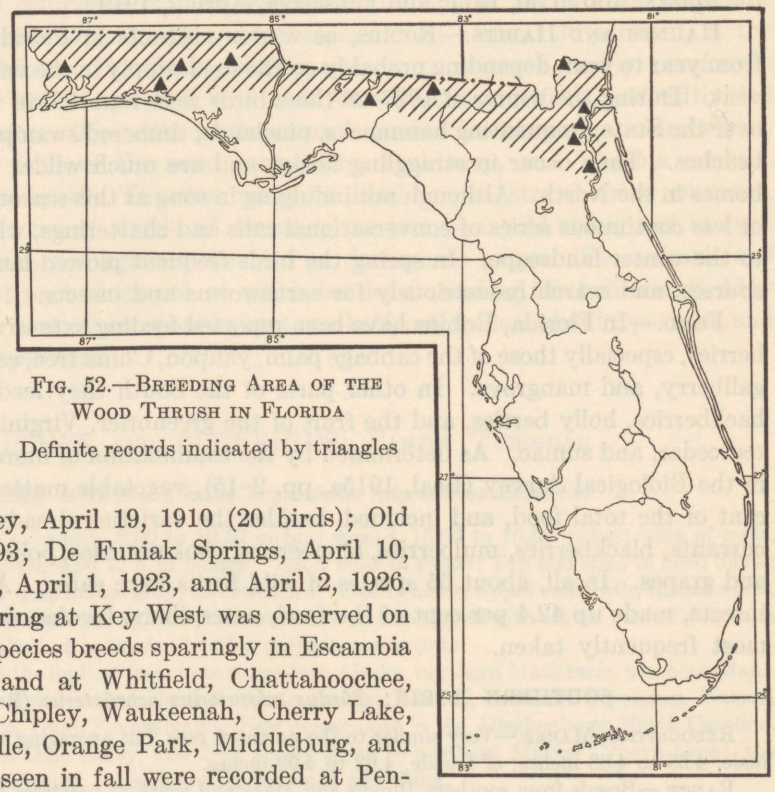

FIG. 52.—BREEDING AREA OF THE WOOD THRUSH IN FLORIDA
Definite records indicated by triangles

HAUNTS AND HABITS.—The Wood Thrush selects heavy, moist woodland, or even swampy bottoms, for its home. The birds are not particularly shy, and in suburban regions often come into dooryards to feed or even to nest. Their alarm note is a sharp *pit-pit*, rapidly repeated, and the song is a loud, rich, flutelike melody, delivered leisurely and apparently with musical feeling. The nests are made of leaves, rootlets, pine twigs, moss, and shreds of paper or bark, with an inner wall of mud and a lining of rootlets. They are placed in the upright forks of a sapling or on a horizontal limb of a tree, 6 to 15 feet above the ground. Grimes (1928d, p. 88) reported finding two nests near Jackson-

ville; one on May 11, 1924, contained three small young and one egg; and the other, about June 1, held large young.

FOOD.—The food of the Wood Thrush consists largely of insects, principally beetles, caterpillars, and ants, with a smaller proportion of bugs, flies, and grasshoppers. Spiders and myriapods are eaten in considerable quantities, and a few snails and earthworms. Vegetable matter constituted about 40 per cent of the food in the stomachs examined, of which wild fruits formed the greater part. The varieties most frequently eaten are mulberries, blackberries, blueberries, chokecherries, frost grapes, elderberries, spiceberries, and dogwood berries. Cultivated fruit comprises less than 4 per cent of the total food. (Cf. Beal, 1915c, pp. 5–8.)

EASTERN HERMIT THRUSH: *Hylocichla guttâta fâxoni* Bangs and Penard

RECOGNITION MARKS.—About the size of the Olive-back (length, 6.5 to 7.5 inches; spread, 11 to 12 inches.) Head and back pale sepia (considerably more brownish than in the Olive-back); *tail cinnamon brown* (much more reddish than the back); underparts white, the sides washed with light grayish olive; throat and breast tinged with pale buff and streaked and spotted with rather large blackish brown spots. (Plate 51.)

RANGE.—Breeds from southern Yukon, southwestern Mackenzie, central Manitoba, and central Quebec south to central Alberta, southern Saskatchewan, central Minnesota, northern Michigan, Ontario, Connecticut, and Long Island (locally), and in the mountains of Pennsylvania and Maryland. Winters from Massachusetts (locally) and the lower Delaware and Ohio Valleys to Texas, the Gulf coast, and Cuba. Occasional in Bermuda.

DISTRIBUTION IN FLORIDA.—A common winter resident in the northern and central parts; rare in the southern part. First migrants in fall appeared at Pensacola, October 20, 1928; De Funiak Springs, October 31, 1908; St. Marks, October 26, 1919; Tallahassee, October 27, 1904; Fort Pierce, November 1, 1918; and Princeton, October 25, 1917. Scott (1890a, p. 120) gives a single record from Key West, in January, 1889. A few birds were seen at Royal Palm Hammock in December and January, 1917–18. Torrey (1904, p. 130) observed some at Miami in March, 1901. The last seen in spring were recorded at Tarpon Springs, April 13, 1895; Eustis, May 3, 1925; Gainesville, April 15, 1887; De Funiak Springs, April 10, 1909; Whitfield, May 7, 1903; and Gonzalez, April 14, 1926.

HAUNTS AND HABITS.—During the winter season, these Thrushes inhabit thick hammocks and the borders of wooded swamps. While not particularly shy, the birds are so quiet and retiring in disposition that they attract little attention as they feed on or near the ground. When startled, they fly to a low perch and slowly raise the tail, uttering sometimes a low *chuck*. They may be distinguished from the other thrushes by the reddish brown tail, which is brighter than the back. The charming notes of this pleasing songster are never heard in the South.

FOOD.—During the winter the Hermit Thrush feeds largely on wild fruits and berries, which constitute more than a fourth of its total food and include upwards of 40 different varieties. Sumac seeds, including those of poison ivy and poison oak, are a favorite article of diet, having been found in 49 of the 551 stomachs examined. Other fruits most frequently eaten are dogwood berries, pokeberries, service berries, holly berries, and the fruit of the greenbrier and Virginia creeper. Insects compose more than half of

the food, the greater quantity being eaten in summer. Those most frequently taken are beetles, ants, bees, wasps, caterpillars, bugs, flies, and crickets. (Cf. Beal, 1915c, pp. 18–23.)

OLIVE-BACKED THRUSH: *Hylocichla ustulâta swâinsoni* (Tschudi)

Recognition Marks.—Smaller than the Gray-cheeked Thrush (length, 6.5 to 7.5 inches; spread, 11.5 to 12.5 inches). Upperparts much like the Gray-cheek's, but paler and more grayish (between brownish olive and light grayish olive); *eye ring pale buff; sides of head buffy* (not grayish); breast and *sides of neck pale cinnamon-buff*, with triangular spots about as in the Gray-cheek. (Plate 51.)

Range.—Breeds from northwestern Alaska, northwestern Mackenzie, northern Manitoba, central Quebec, and Newfoundland south to Oregon, Nevada, Utah, Colorado, northern Michigan, and New York, and in the mountains from Massachusetts to West Virginia. Winters from southern Mexico to Brazil and Argentina. Casual in Cuba and Bermuda.

Distribution in Florida.—An uncommon spring and fall migrant. Specimens were taken at Key West, April 29, 1889; Tarpon Springs, April 29, 1889; Amelia Island, May 9, 1906; Chokoloskee, October 11, 1915 (Ellis, 1915, p. 209); St. Marks, October 25,1919; and Pensacola, October 27, 1925, and September 27, 1928. The species was reported at Palma Sola, October 1, 1911, and on the Tortugas, May 2, 1913, and May 14, 19, and 22, 1922 (abundant, May 19). The record of specimens taken at Enterprise and St. Augustine in February (J. A. Allen, 1871, p. 251) is probably an error, as the species is not known to winter in the United States.

Haunts and Habits.—The Olive-backed Thrush is similar in habit to the other northern thrushes—the Gray-cheek and the Veery—and is often found associated with them in upland woods during their migrations. The birds feed mainly on the ground and, although not particularly shy, when startled they usually fly to a low perch in a tree or bush and gaze intently at the intruder, affording an opportunity to note the buffy breast, cheeks, and eye ring—characters that separate this species from the Gray-cheek. Their alarm note is a soft, liquid "*peenk*," suggesting a drop of water falling into a pool.

GRAY-CHEEKED THRUSH: *Hylocichla minima alíciae* (Baird)

Other Name: **Alice's Thrush**

Recognition Marks.—Nearly as large as the Wood Thrush, but more slender (length, 7.5 to 8 inches; spread, 12.5 to 13.5 inches). Upperparts brownish olive, the tail olive-brown; eye ring whitish (but inconspicuous); *sides of head behind eye grayish* (not buffy); underparts white, the sides rather heavily washed with light grayish olive; breast faintly washed with buff, and moderately spotted with triangular spots of sooty drab or black—much smaller than in the Wood Thrush. (Plate 51.)

Range.—Breeds in a narrow belt in the Hudsonian Zone, just south of the tree limit, from northeastern Siberia, through northwestern Alaska, northern Mackenzie, and northern Manitoba to central Quebec and Newfoundland. Winters in northern South America. Accidental in Cuba.

Distribution in Florida.—A rare migrant in spring and fall on the mainland; numerous on the Tortugas. Specimens were taken at Pass-a-Grille, April 24, 1928; Gainesville, April 26, 1887; Tarpon Springs, April 29, 1889; Kissimmee, May 10, 1893; Eau Gallie, May 3, 1910; Key West, April 28, 1887; Aucilla River (mouth), May 12, 1926; and the Wacissa River, May 14, 1926. The species was reported at Palma Sola,

October 14, 1909, and May 6 and November 19, 1911; at Princeton, September 19, 1916; and at Daytona Beach, May 7, 8, 9, 11, and 12, 1928. One bird was killed against the lighthouse on the Tortugas, November 23, 1918, and Bartsch found the birds common there May 14 to 22, 1922.

HAUNTS AND HABITS.—During its migrations the Gray-cheeked Thrush frequents dry, upland woods, where it spends much of its time on the ground searching among leaves and rubbish for its food. Like the other northern thrushes, it is shy and quiet, seldom uttering any sound but a low *chuck*. This species was confused with the Olive-backed Thrush by the earlier ornithologists, and field identifications of these two birds are difficult, even for an expert.

VEERY: *Hylocichla fuscescens fuscescens* (Stephens)

OTHER NAME: **Wilson's Thrush**

RECOGNITION MARKS.—Smaller than the Wood Thrush (length, 6.5 to 7.5 inches; spread, 11.5 to 12.5 inches). Upperparts snuff brown; tail light olive-brown; upper breast pinkish buff, *moderately streaked with V-shaped spots of snuff brown;* belly white, the sides washed with pale mouse gray.

RANGE.—Breeds from northern Michigan, central Ontario, and Newfoundland south to northern Illinois, northern Indiana, northern Ohio, and northern New Jersey, and in the Alleghenies to northern Georgia. Migrates through Yucatan and Central America. Winters in Colombia, British Guiana, and Brazil.

DISTRIBUTION IN FLORIDA.—A rare or sometimes locally common migrant, chiefly in spring. Earliest migrants were reported at Sandy Key, April 16, 1917; Egmont Key, April 19, 1910 (30 birds); Sanibel Island, April 27, 1910 (6); Amelia Island, May 5, 1906; Daytona Beach, May 7, 1929; St. Marks, May 3, 1915; Whitfield, May 8, 1903; and Pensacola, April 30, 1924, and May 2, 1925. Scott recorded the species as common at Key West, April 28 and May 3, 1887. Bartsch observed a few on the Tortugas, May 14 to 22, 1922. The only fall records are from Tallahassee, where Williams found the birds rather common between September 11 and October 9, 1904.

HAUNTS AND HABITS.—During migration the Veery is usually found in dry, upland woods, feeding chiefly on or near the ground. It is a shy, quiet bird, rarely uttering any sound but its soft, liquid alarm note, *whee-ŏŏ*.

EASTERN BLUEBIRD: *Sialia sialis sialis* (Linnaeus)

RECOGNITION MARKS.—Length, 6.30 to 7.50 inches; spread, 11.50 to 13.00 inches; bill, .43 to .48 inch. *Adult male:* Head and upperparts smalt blue (deep purplish blue); wings and tail edged with the same; throat, breast, and sides mikado brown (reddish brown) or verona brown; belly white. *Adult female:* Head neutral gray, tinged with light blue; back and rump king's blue (medium gray-blue), the fore back overlaid with mouse gray; tail similar, becoming dusky at the tip; breast and sides pale snuff brown.

RANGE.—Breeds from southern Manitoba, central Ontario, southern Quebec, and Newfoundland south to southern Texas, the Gulf coast, and northern Florida. Winters chiefly from the Middle States south to the Gulf of Mexico.

DISTRIBUTION IN FLORIDA.—Resident in northern Florida. Specimens taken in the breeding season have been examined from Portland, Madison, Jacksonville, and Middle-

burg. The bird is reported as a common resident at De Funiak Springs, Pensacola, and St. Marks, being more numerous in winter than in summer, because of the influx of migrants from the North. Grimes (1931a, p. 84) mentions finding a nest with four eggs at Jacksonville on April 6, 1930.

HAUNTS AND HABITS.—See under the Florida Bluebird.

FLORIDA BLUEBIRD: *Siâlia siâlis grâta* Bangs[1]

RECOGNITION MARKS.—Closely similar to the northern race, but *bill larger* (.49 to .55 inch).

RANGE.—Resident nearly throughout peninsular Florida, from about Lake County south to Royal Palm Hammock (fig. 53). Breeding specimens of this race have been examined from Pine Castle (April); Green Swamp (Polk County); Port Richey (May); Manatee (June); Braden River; Deep Lake (March 25); and Royal Palm Hammock (June). Specimens taken in February and March are at hand from Kissimmee, Fort Bassenger, Lake Arbuckle (Polk County), Lake Trafford (Collier County), and Fort Thompson (upper Caloosahatchee River). The most typical birds are those from south of the Caloosahatchee River; specimens from central and northern Florida show approach to *sialis* in their somewhat smaller bills.

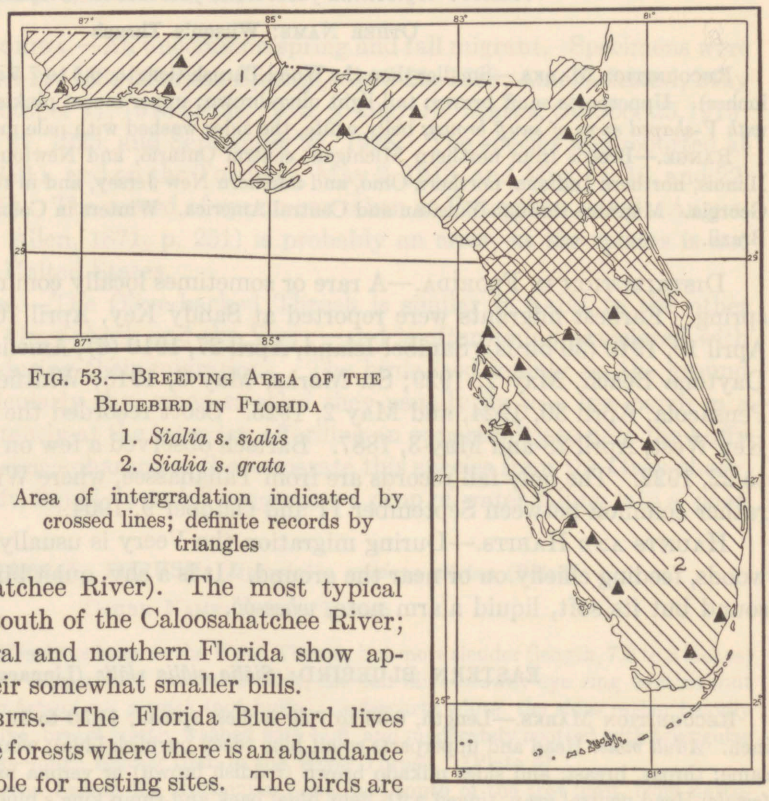

FIG. 53.—BREEDING AREA OF THE BLUEBIRD IN FLORIDA

1. *Sialia s. sialis*
2. *Sialia s. grata*

Area of intergradation indicated by crossed lines; definite records by triangles

HAUNTS AND HABITS.—The Florida Bluebird lives chiefly in the open pine forests where there is an abundance of rotting stubs suitable for nesting sites. The birds are not at all shy, and their sweet, mellow whistles add charm to the desolate wastes that compose so much of central and southern Florida. The nests are in hollow stubs or fence posts, usually from 4 to 25 feet above the ground. Eggs were found at St. Marks, March 29, April 18 and 30, and June 27; Archer, April 16, 1888; Thonatosassa, April 22, 1888; Orlando, April 5, 1911, and April 28, 1910; and Miami, April 12, 1871. The clutch commonly numbers 4 or 5, and two broods are usually reared each season.

[1] Auk, vol. 15, p. 182, April, 1898; type from Miami, Fla.

Bluebirds feed chiefly on or near the ground; from a low perch, such as a dead stub or a fence post, they carefully scan the surrounding territory and frequently drop to the ground to capture some insect that has caught their eye. In fall and winter the birds gather into loose flocks and perch in numbers on telephone wires along the roadsides. In winter they roost in hollow trees or in bird boxes, and during protracted cold spells they suffer from cold or lack of food, and many perish.

FOOD.—The food of the Bluebird, as shown by examination of 855 stomachs in the Biological Survey (Beal, 1915a, p. 24), consists of about 68 per cent animal matter (insects, with a few spiders, myriapods, etc.) and 32 per cent vegetable. The insects eaten include Orthoptera (grasshoppers, crickets, and katydids), 22 per cent; beetles, 20 per cent; Lepidoptera (caterpillars, with a few moths), 10 per cent; and smaller quantities of ants, wasps, bees, flies, and bugs. The vegetable food is composed largely of fruit, chiefly wild species, including bayberries, cedar berries, hackberries, pokeberries, blackberries, blueberries, elderberries, and the fruit of the sumac, poison ivy, holly, inkberry, Virginia creeper, and dogwood. Professor Beal remarks in this connection:

> The fruit-eating period of the bluebird is not in summer when the fruit is fresh on the tree, but from October to February, inclusive, during which months three-fourths of its fruit eating is done. From this it appears that fruit is really the winter food of the bluebird, tiding it over until insects are again abundant, and taking the place of seeds eaten by so many birds at this season.

KINGLETS AND GNATCATCHERS: FAMILY SYLVIIDAE

BLUE-GRAY GNATCATCHER: *Polióptila caerúlea caerúlea* (Linnaeus)

RECOGNITION MARKS.—About the size of a Kinglet, but bill and tail longer (length, 4.25 to 5.00 inches; spread, 5.75 to 6.50 inches; tail, 1.75 to 2.25 inches). *Adult male:* Upperparts green-blue gray, darkest on the head; *a white eye ring;* forehead bordered with a black line at base of bill; underparts white, faintly shaded on sides with bluish gray; middle tail feathers black; *outer tail feathers nearly all white. Adult female:* Similar to the male, but upperparts paler (deep dull gray); no black mark on forehead. (Plate 52.)

RANGE.—Breeds from eastern Nebraska and the southern parts of Wisconsin, Michigan, and Ontario, southwestern Pennsylvania, Maryland, and southern New Jersey south to southern Texas, the Gulf coast, and central Florida. Winters from southern Texas, southern Mississippi, and the coast of South Carolina to the Bahamas and Cuba, and through eastern Mexico to Yucatan and Guatemala. Casual north to Minnesota and New England.

DISTRIBUTION IN FLORIDA.—A common summer resident in the northern and central parts, breeding as far south as Osceola and Collier Counties; occurs sparingly in winter in the northern part, and southward in numbers to Royal Palm Hammock, Cape Sable, and the Florida Keys. It has been recorded in the breeding season at Kissimmee, Deer Park, Tarpon Springs, Braden River, Turners River, Immokalee, and at many places in northern Florida. Scott (1890, p. 119) reported it common at Key West from late in July or the middle of August to about April 1. Bartsch observed single birds on the Tortugas, September 5, 1923, and August 23, 1925; specimens were taken there by Scott, March 21 to April 8, 1890.

HAUNTS AND HABITS.—Gnatcatchers inhabit oak hammocks, open pine lands, and small cypress swamps. They are very active creatures, having a quick, jerky flight, the

tail especially being constantly in motion. They utter a variety of rather squeaky, high-pitched notes, none of which are loud or likely to attract attention. The nests are artistic little cups, compactly built of plant down, dried blossoms, fine grasses, and similar material, bound together with spider webs and ornamented on the outside with grayish-colored lichens. They are saddled on slender branches of oaks, hickories, cypresses, or pines, at a height varying from 15 to 50 feet above the ground. Eggs were found at St. Marks, April 17, 1916, and April 8, 1919; Jacksonville, April 12, 1930; Orlando, May 2, 1915; Daytona, May 6, 1918; and Coronado, May 30, 1910. The set usually numbers 4 or 5.

S. A. Grimes (1928e, p. 26), writing from Duval County, says:

> Oddly, or not, the pine is the tree most commonly chosen for the nest site. In my experience the pines (at least two varieties) have been selected for this purpose oftener than all other trees combined. Nests were found ranging from four feet up in a haw to perhaps eighty feet up in a cypress. But by far the greater number of nests were from twenty to twenty-five feet up in pines. Of eight nests found in a short time in a small, densely wooded tract in the morning of April 8th, 1925, six were in pines, one in a black gum, and the other in an oak. All were in the process of building and varied from half an inch in height to apparent completion, showing a range in time of beginning of not more than two or three days.

Food.—Forbush (1929, vol. 3, p. 386) says of the Gnatcatcher: "It is known to take locusts, joint-worms, flies, gnats, caddice flies, ants and other hymenoptera, wood-boring beetles, weevils and spiders. It also feeds on the cotton-leaf worm."

GOLDEN-CROWNED KINGLET: *Régulus satrâpa satrâpa* Lichtenstein

Recognition Marks.—About the size of the Florida Chickadee, but tail shorter (length, 3.5 to 4 inches; spread, 6.5 to 7 inches). *Adult male:* Middle of crown cadmium orange, bordered by pale lemon yellow and that by black; a white line over the eye; fore back grayish olive; hinder back and rump bright citrine drab (olive-drab); underparts dull white, washed with pale buff; wings and tail hair brown (dark-drab), with greenish edgings; the wings with a yellowish white bar. *Adult female:* Similar, but middle of crown dark citron yellow, without orange. (Plate 52.)

Range.—Breeds from northern Alberta, northern Manitoba, and central Quebec south to Michigan, New York, the mountains of Massachusetts, in the Alleghenies to North Carolina, and in the Rocky Mountains to northern Arizona and New Mexico. Winters from Iowa, Ontario, and New Brunswick to northern Florida and northeastern Mexico.

Distribution in Florida.—A common winter resident in northwestern Florida; rare in the peninsula, south to the lower Suwannee River. First arrivals in fall were recorded at Pensacola, October 20, 1917; De Funiak Springs, October 1, 1908, and October 29, 1909; Whitfield, November 17, 1902; Tallahassee, October 27, 1904; St. Marks, October 26, 1913; and Amelia Island, November 6, 1906. A pair was taken at Jacksonville by Maynard in December, 1868. Longstreet reports the bird seen but once at Daytona Beach, February 14, 1925. Brewster took two specimens on the lower Suwannee River, March 14 and 21, 1890. The last seen in spring was noted at Pensacola, March 13, 1925.

Haunts and Habits.—These little Kinglets occur during the winter season in hammocks and pine timber in small, loose companies, often associated with chickadees and nuthatches. They feed much about the tips of the branches, fluttering from tuft to tuft or hovering in front of a bunch of leaves, seeking to discover some of the small insects

that form their food. The call note of the birds is described as "a fine, high *ti-ti*, audible only to practiced ears" (Chapman).

FOOD.—According to Barrows (1912, p. 702):

> The food of this bird consists almost entirely of insects and their eggs, and it can not be doubted that it is decidedly beneficial to the farmer and fruit grower. It is often seen eating plant lice and is a common bird in the orchards during migration, on such occasions spending much time about the opening buds and among the terminal twigs, where it collects large quantities of harmful insects.

EASTERN RUBY-CROWNED KINGLET: *Corthylio calendula calendula* (Linnaeus)

RECOGNITION MARKS.—Slightly larger than the Golden-crowned Kinglet (length, 4.00 to 4.50 inches; spread, 6.60 to 7.35 inches). *Adult male in winter:* Upperparts citrine drab (olive-drab); *crown patch* (more or less concealed) *flame scarlet;* underparts olive-buff; *a conspicuous white eye ring. Adult female:* Similar, but lacking the scarlet crown patch. (Plate 52.)

RANGE.—Breeds from northwestern Alaska, northwestern Mackenzie, northern Manitoba, and northern Quebec south to central Ontario, New Brunswick, Nova Scotia (casually Maine), and in the mountains to southern California, southern Arizona, and central New Mexico. Winters from southern British Columbia, Iowa, and Virginia south over the United States and the Mexican Tableland to Guatemala.

DISTRIBUTION IN FLORIDA.—A common winter resident in nearly all sections; rare in the extreme southern part. First arrivals in fall were recorded at St. Marks, October 9, 1919; Pensacola, October 13, 1928; De Funiak Springs, October 19, 1908; Daytona Beach, November 14, 1924; and Gainesville, November 15, 1919. The birds were reported abundant throughout the winter at Pensacola, St. Marks, Amelia Island, and Eau Gallie. Torrey (1904, p. 107) mentions them as common at Miami in February; at Royal Palm Hammock, only one has been observed (January 4, 1918). Scott said the species was common at Tarpon Springs, and small numbers have been observed at Fort Myers and Bonita Springs. The last seen in spring were noted at Gainesville, April 16, 1887; Winter Park, April 16, 1902; Daytona Beach, April 19, 1925; St. Marks, April 19, 1915; De Funiak Springs, April 17, 1909; Whitfield, April 23, 1903; and Pensacola, April 21, 1925, and May 1, 1926.

HAUNTS AND HABITS.—The Ruby-crowned Kinglet, during its stay in the South, is found chiefly in hammocks, where it ranges in the undergrowth and lower limbs of the trees. The birds are not so likely to be found in flocks as are the Golden-crowned Kinglets. They are active little creatures, having the habit of fluttering their wings nervously every little while, as they fly from branch to branch, frequently uttering a soft scolding note. Late in spring, just before they leave for the North, they often render snatches of their song, which, although not to be compared with the full-voiced song as heard on the breeding grounds, is still a remarkably loud and highly pleasing warble, quite surprising from so small a bird. While singing, the "little king" displays his half-concealed crown patch to good advantage, but at other times his plain colors afford the novice little help in identification.

FOOD.—Professor Beal (1907, pp. 81–84), who has investigated the food of this Kinglet in California, finds it to be composed of 94 per cent animal matter and 6 per cent vegetable matter. "Hymenoptera, in the shape of wasps, and a few ants, appear to be

the favorite food, as they aggregate over 32 per cent of the whole." Bugs were next in importance, constituting nearly 26 per cent of the food; beetles furnished 13 per cent, and flies 17 per cent. Caterpillars, moths, butterflies, and spiders made up most of the remainder. The vegetable matter included fruit, principally elderberries and the seeds of weeds and of poison oak.

WAGTAILS: Family Motacillidae

AMERICAN PIPIT: *Ánthus spinolétta rubéscens* (Tunstall)

Other Name: Titlark

Recognition Marks.—Slightly larger than the Song Sparrow, *with slender bill* like a warbler's (length, 6.00 to 6.75 inches; spread, 10 to 11 inches); *a ground walker*, rarely seen in trees. *Winter plumage:* Upperparts pale olive-brown or light brownish olive, faintly streaked with fuscous; underparts pinkish buff, streaked on breast and sides of neck with fuscous; wings fuscous with buffy edgings; tail fuscous, *the outer feathers with large white patches.* (Plate 57.)

Range.—Breeds in the Arctic Zone from northeastern Siberia, northern Alaska, northern Mackenzie, and the west coast of Greenland south to Great Slave Lake, northern Manitoba, northern Quebec, and Newfoundland, and on high mountains south to California, Colorado, and New Mexico. Winters from southern California and the Ohio and Delaware Valleys to the Gulf coast and Guatemala. Casual in Bermuda.

Distribution in Florida.—An abundant winter resident in the northern parts as far south as Gainesville; less common from there southward; rare in southern Florida and on the Keys. First arrivals in fall were recorded at Chipley, October 10, 1903; Pensacola, October 11, 1925; St. Marks, November 2, 1916; and Ocala, November 1, 1879. Maynard (1881, p. 45) reported the species "exceedingly abundant" about Jacksonville, and R. W. Williams (1906, p. 159) observed flocks containing hundreds of the birds at Lake Lafayette, Leon County, late in November. Scott (1881, p. 15) found them common at Clearwater in February, 1880. A flock of 25 was seen at Bassenger Landing, February 2, 1917, by Francis Harper, and a flock of 50 near Charlotte Harbor, December 25, 1924, by Mrs. Byrd. I noted small numbers on the south shore of Lake Okeechobee in February, 1918, and one individual on the prairie at Cape Sable, February 9, 1918. Atkins observed a flock of 10 or 12 at Key West, December 7, 1888, and again later in the month. The last seen in spring were recorded at Bassenger, March 16, 1907; Gainesville, March 17, 1887; Chipley, March 20, 1904; and Pensacola, March 25, 1926.

Haunts and Habits.—In winter Pipits are found in flocks, frequenting pastures, cultivated fields, prairies, marshes, and occasionally sand dunes and sea beaches. They are strictly ground dwellers, and may be distinguished from the ground sparrows by their habit of walking instead of hopping. They are usually unsuspicious, and even when alarmed often fly but a short distance before alighting. Their notes, uttered in flight, are sharp and metallic, suggesting the syllables *pip'-it*—hence their common name.

Food.—The Pipit is a highly useful bird as it feeds very largely upon insects. Its diet includes beetles, bugs, grasshoppers, crickets, spiders, small mollusks, and occasionally small seeds and berries. In the destruction of boll weevils it renders the farmer invaluable service. Examination of 68 stomachs of these birds taken in Louisiana cotton

fields showed that half of them had consumed boll weevils, the total number destroyed by them being 120. The Pipits pick up weevils in the fields throughout the winter, and in spring they obtain some by following the plowman.

SPRAGUE'S PIPIT: *Ánthus spráguei* (Audubon)

OTHER NAME: **Missouri Skylark**

RECOGNITION MARKS.—About the size of the American Pipit; *hind toe and claw longer than tarsus.* Upperparts fuscous, varied with buffy white and pinkish buff; underparts dull whitish, the breast sparingly spotted or streaked with fuscous (appearing lighter beneath than in the American Pipit).

RANGE.—Breeds from southwestern Saskatchewan and southern Manitoba south to Montana and North Dakota. Winters from Texas, southern Louisiana, and southern Mississippi to eastern and central Mexico; casual in South Carolina, Georgia, and Florida.

DISTRIBUTION IN FLORIDA.—A rare winter visitant. Known from four records, as follows: Lake Tohopekaliga, one seen by Arthur T. Wayne (1905a, p. 400) early in November, 1892; Lukens, specimen taken December 31, 1907, by Arthur H. Helme; Charlotte Harbor, 8 miles northwest of Punta Gorda, specimen taken February 23, 1921, by C. J. Pennock (1921, p. 195); and Lake Miccosukee, one seen by H. L. Stoddard, November, 24, 1927.

HAUNTS AND HABITS.—Doctor Coues (1874b, p. 43), describing the habits of this species on the prairies of North Dakota, says:

> The ordinary straightforward flight of the bird is performed with a regular rising and falling, like that of the Titlark; but its course, when startled from the ground, is exceedingly rapid and wayward; at such times, after the first alarm, they are wont to hover around in a desultory manner for a considerable time, and then pitch suddenly down to the ground, often near where they rose. Under these circumstances they have a lisping, querulous note.

The bird has a remarkable song, which is delivered from a point high in the air, after the manner of the Skylark of Europe.

WAXWINGS: FAMILY BOMBYCILLIDAE

CEDAR WAXWING: *Bombycilla cedrórum* Vieillot

OTHER NAMES: **Cedar Bird; Seal**

RECOGNITION MARKS.—About the size of the Bluebird (length, 6.50 to 7.25 inches; spread, 11 to 12 inches); *head crested. Adult:* Head fawn color, shading on back to buffy brown or pale olive-brown; a black band from bill through eye; throat and breast similar to the back; belly pale ecru-olive; wings and tail dark plumbeous; *secondaries and sometimes the tail feathers with reddish waxen tips;* tail tipped with wax yellow. *Immature:* Hair brown, streaked with buffy white.

RANGE.—Breeds from central British Columbia, central Alberta, central Manitoba, northern Ontario, and central Quebec south to southern Oregon, northern New Mexico, Kansas, northern Arkansas, northern Georgia, and North Carolina. Winters nearly throughout the United States and south to Cuba, Mexico, and Panama. Accidental in the West Indies.

DISTRIBUTION IN FLORIDA.—An abundant migrant and moderately common winter resident over most of the State. There are few records in the fall, and apparently the birds are most abundant late in winter and in spring. The earliest date of arrival is

October 19, 1901, at Tallahassee; other birds were recorded as arriving at Daytona Beach, October 22, 1927; Pensacola, November 12, 1929; Amelia Island, December 15, 1905; Tarpon Springs, December 30, 1889; Upper Matecumbe Key, January 29, 1910; Key Largo, March 2, 1919; Naples, March 10, 1924; and Alligator Lake, March 20, 1924. Large flocks were seen at Winter Park in April, 1914, the last (18 birds) being noted on May 4, 1914. Miss Lillian Arnold reports about 50 Cedar Birds in Gainesville during several days in March, 1929, and E. R. Elliott records about 500 present at Clearwater Beach on February 26, 1930. The last seen in spring were noted at De Land, May 14, 1914; St. Marks, May 21, 1926; De Funiak Springs, May 13, 1909; Whitfield, May 15, 1903; and Pensacola, May 27, 1926.

HAUNTS AND HABITS.—Cedar Birds are very sociable in their habits, and are found in flocks during the greater part of the year. They travel in compact companies, with a rather swift, steady flight, uttering a series of faint, lisping notes. With their friendly ways, their delicate coloring, and jaunty appearance, they easily attract attention and are general favorites with bird lovers. The birds frequent cedar, hackberry, and other berry-bearing trees, and when mulberries are ripening they devote themselves largely to that fruit. They have big appetites, amounting often to gluttony, and there are instances on record of their having fed so liberally on overripe wild cherries as to become intoxicated.

FOOD.—The Cedar Bird feeds to a considerable extent on fruit, both wild and cultivated, and its fondness for cherries has gained for it in the North the name of "cherry bird." Examination in the Biological Survey of 152 stomachs, however, showed that 74 per cent of the food consisted of wild fruit and only 13 per cent of cultivated fruit, and cherries were found in only 9 of 41 stomachs taken in June and July. The birds are said to be particularly fond of raspberries, blueberries, serviceberries, and buffalo berries (Beal, 1904, p. 38). During their stay in the South they feed to a large extent on cedar berries and hackberries. They take, also, the berries of the haw, sumac, bittersweet, chokecherry, black alder (*Ilex verticillata*), and greenbrier.

SHRIKES: FAMILY LANIIDAE

LOGGERHEAD SHRIKE: *Lánius ludoviciánus ludoviciánus* Linnaeus

OTHER NAMES: **French Mockingbird; Butcherbird**

RECOGNITION MARKS.—About the size of the Mockingbird (length, 8.00 to 8.75 inches; spread, 12.50 to 13.00 inches; tail, 3.50 to 4.00 inches), but *tail shorter, head and bill stouter,* the bill hooked at tip. *Adult:* Upperparts neutral gray; underparts white, washed with pale smoke gray; a broad band of fuscous-black on side of head; wings and tail fuscous-black, the outer tail feathers with large white terminal patches, and wings with a white bar. *Immature:* Similar to the adult, but underparts clouded with pale vinaceous-buff. (Plate 48.)

RANGE.—Resident in the Lower Austral Zone from southern North Carolina to Florida and west through southern Georgia and Alabama to Louisiana.

DISTRIBUTION IN FLORIDA.—A common resident in all sections except on the Keys. Recorded from Cape Sable, Homestead, Chokoloskee, Naples, Moorehaven, Sanibel Island, Sarasota, Immokalee, Lake Gentry, Greenville, Waukeenah, Pensacola, and

PLATE 52

EXPLANATION OF PLATE 52

VIREOS, KINGLETS, AND THE GNATCATCHER

The upper figures, from left to right, are: Blue-gray Gnatcatcher, Ruby-crowned Kinglet, and Golden-crowned Kinglet; at the left center is a White-eyed Vireo, and beneath it a Red-eyed Vireo; at the right center is a Blue-headed Vireo; the lower figure is a Yellow-throated Vireo.

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many other places. Nests with eggs have been found at Jacksonville, March 11, 1930; Archer, February 9 and 23, March 7 and 24, and April 11, 1888; Orlando, February 15, 1886, and March 24, 1911; Lake Istokpoga, March 10, 1910; and Seven Oaks, March 17, 1908, and May 30 and June 3, 1903.

HAUNTS AND HABITS.—The Loggerhead Shrike is a bird of the open country, abounding on cultivated lands and on the prairies, and very frequently seen perched on the telephone wires along roadsides. Its nests are most often placed in bushes or small trees, at a height of 4 to 12 feet, but sometimes are found in pines, oaks, and orange trees as high as 25 feet from the ground. They are somewhat bulky structures, composed of small twigs, rags, cotton, weed stalks, and feathers. The eggs are 4 to 6 in number, commonly 5.

Shrikes do not hunt for their prey, but sit quietly on some elevated perch—a dead limb or a telephone wire—watching keenly for some insect or small mammal to make a move; dropping lightly to the ground, they seize the quarry in their claws and kill it with a stroke of the beak. The victims are usually carried to a nearby tree or fence and impaled on a thorn or a barbed wire, either to be pulled to pieces at once or left for future use. N. C. Longee, of Gainesville, reports seeing a Shrike bring a number of large live cattle ticks and impale them in a row on the barbs of a wire fence. The birds are not noisy but most of their notes are harsh and unmusical; occasionally one makes an attempt at singing, which Chapman describes as "a series of guttural gurgles, squeaky whistles, and shrill pipes."

FOOD.—A study of the food habits of the Loggerhead Shrike made by the Biological Survey (Judd, 1898, p. 22) showed the food to consist of vertebrates (mammals, birds, and a few fish), 28 per cent, and invertebrates (insects, spiders, and snails), 72 per cent. Insects form the bulk of the food during the warmer months, while in winter the greater part consists of mice and small birds. Mice are taken at all seasons and in winter compose half the food; birds make up only 8 per cent of the food for the year. I once shot a Shrike in the act of eating a lizard.

According to Judd, the larger part of the insect food of this Shrike consists of *Orthoptera* (grasshoppers and crickets), and the remainder principally of beetles. In summer, when grasshoppers are abundant, the Loggerhead does not appear to attack birds. Grasshoppers and crickets were found in three-fourths of the stomachs examined, and 14 of the 88 Shrikes had fed exclusively upon these pests. Cankerworms, cutworms, and other caterpillars, together with wasps and spiders, are destroyed to a moderate extent. From his investigations Judd concluded that the Loggerhead is a decidedly beneficial bird, and in this opinion he is supported by all who have studied the bird's habits.

STARLINGS: FAMILY STURNIDAE

EUROPEAN STARLING: *Stúrnus vulgâris vulgâris* Linnaeus

RECOGNITION MARKS.—In size between that of the Florida Grackle and the Red-winged Blackbird (length, 7.50 to 8.50 inches; spread about 15.50 inches; tail, 2.50 to 2.75 inches); bill nearly straight, pointed; *tail short and nearly square; wings pointed. Adult in winter plumage:* Top of head and nape iridescent purple; back dark glossy green, the whole upperparts heavily speckled with cinnamon-drab or

dark vinaceous-buff; underparts iridescent purple and green, heavily spotted with white; bill blackish brown. *Adult in summer plumage:* Basal coloration as in winter, but *without spots* on feather tips (except small spots on the back); *bill yellowish. Immature plumage:* Upperparts hair brown; lower parts drab, with some white on throat and belly.

RANGE.—Western and central Europe, wintering south to Africa. Introduced in 1890 into New York City, and since then has spread north to Nova Scotia and Ontario, west to Wisconsin, Kansas, and Texas, and south to Georgia, Alabama, Mississippi, and northern Florida. The species is now permanently established in eastern North America and will undoubtedly increase rapidly and extend its range into all suitable country.

DISTRIBUTION IN FLORIDA.—The first recorded specimen was taken on Amelia Island, January 24, 1918. Four individuals were seen at Lake Jackson, in Leon County, by H. L. Stoddard, November 9, 1924 (M. T. Cooke, 1925, p. 4); the species was reported by F. B. Robinson at Jacksonville and St. Augustine in March, 1925; and four birds were noted by C. W. Townsend (1926a, p. 371) at Wakulla Beach, January 26, 1926. Weston (1930b, p. 58) recorded a flock of about 150 birds in Escambia County, near Ferry Pass, on November 17, 1929, and a smaller flock near Gonzalez, November 24, 1929. L. T. Nieland (1930, p. 59) noted 10 birds near Bunnell, November 14, 1929, and Homer Townsend (1931, p. 66) observed a flock of 8 birds on the St. Johns River, between Sanford and Osteen, January 11, 1931. A bird banded at Norristown, Pennsylvania, November 20, 1928, was killed at Palatka, during the winter of 1930–31.

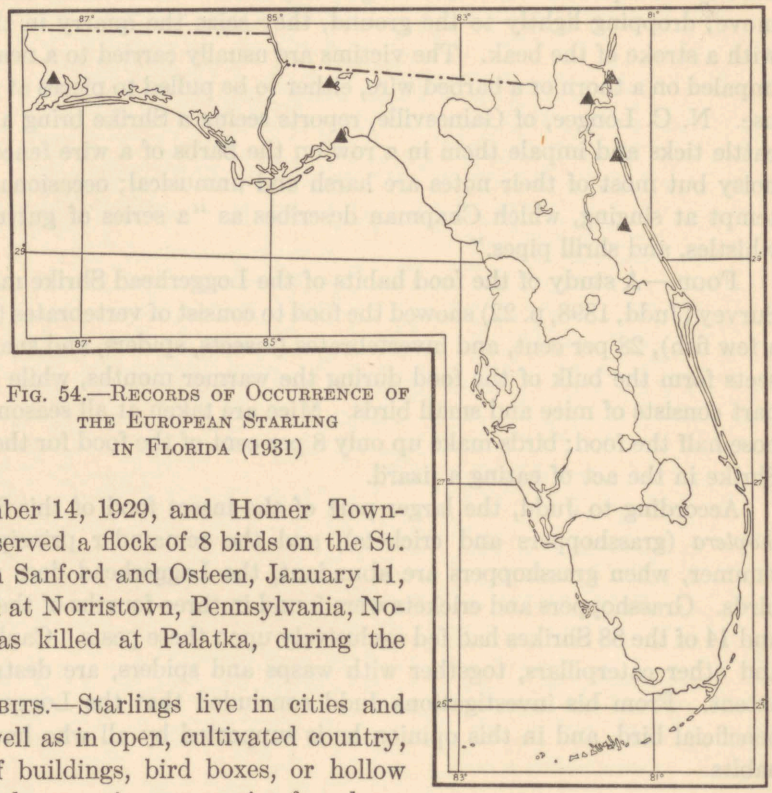

FIG. 54.—RECORDS OF OCCURRENCE OF THE EUROPEAN STARLING IN FLORIDA (1931)

HAUNTS AND HABITS.—Starlings live in cities and suburban towns as well as in open, cultivated country, nesting in crevices of buildings, bird boxes, or hollow trees. They are strongly gregarious, occurring for a large part of the year in flocks, often of considerable size. Late in summer and in autumn they gather into community roosts in shade trees in towns or cities, or sometimes in a marsh, and in winter they roost on ledges of buildings in the heart of large cities. In the Middle States, two broods are raised, beginning about the middle of April. No instances of nesting in Florida have been reported, but the breeding period may be more extended than in the North.

Starlings are sociable birds and their notes are attractive. The call of the male is described as "a high, clear, rather long-drawn, ascending whistle," and in addition the birds are very successful in mimicking the notes of other birds, such as the Bob-white, Flicker, Blue Jay, Wood Pewee, Red-winged Blackbird, Bluebird, and Carolina Wren.

Food.—Extensive study of the food habits of the Starling (Kalmbach and Gabrielson, 1921) has shown that a large share (41.5 per cent) of the bird's food for the year consists of insects, principally beetles, grasshoppers, crickets, and caterpillars. Millipeds are extensively eaten, and spiders frequently. Wild fruits form the largest single item in the yearly food, amounting to nearly 24 per cent of the total. Among those commonly taken are mulberries, blackberries, wild cherries, elderberries, bayberries, June berries, and the fruit of the sour gum, sumac, Virginia creeper, and poison ivy. Apples are eaten on the trees to a considerable extent, and other small fruits are sometimes attacked. Damage to oranges may be expected. Corn is occasionally injured to a slight extent. The most serious damage done by the Starling is its destruction of cultivated cherries, which sometimes amounts to almost complete removal of the fruit of a single tree by a flock of the birds.

VIREOS: Family Vireonidae

WHITE-EYED VIREO: *Vireo griseus griseus* (Boddaert)

Other Name: **Hanging Bird**

Recognition Marks.—The smallest of the Florida vireos (length, 4.75 to 5.50 inches; spread, 7.50 to 8.50 inches); bill much shorter than that of the Red-eyed or Yellow-throated Vireo. *Eye ring and broad streak from eye to nostril wax yellow;* upperparts yellowish olive, the nape washed with neutral gray; underparts white, the sides greenish yellow; wings fuscous, with two prominent yellowish white bars. (Plate 52.)

Range.—Breeds from southeastern Nebraska, southern Wisconsin, New York, and Massachusetts south to central Texas, southern Alabama, and southern Florida. Winters from Texas, southern Georgia, and South Carolina south to Yucatan and Guatemala; casual in Cuba.

Distribution in Florida.—An abundant summer resident throughout the State, except on the Keys, where another race is found; common in migration and fairly numerous in winter, especially in the southern part. Specimens of this race, taken in the breeding season, have been examined from Amelia Island, St. Marks, Pensacola, Port Richey, Davista, Fort Kissimmee, Lake Gentry, Sebring, Istokpoga Lake, Caxambas, Royal Palm Hammock, and Cape Sable.

Wintering birds have been taken at Royal Palm Hammock (January 25, 1918) and at Okeelanta (February 23, 1918). The species is reported common in winter as far north as Gainesville (Chapman, 1888a, p. 275), and occasional individuals have been recorded from Fernandina (February 26, 1903), Tallahassee (December 2, 1900), Whitfield (February 26, 1903), and Pensacola (February 22, 1922, and February 23, 1923). Two specimens taken at Planter, Key Largo, March 9 and 11, 1895, were probably migrants.

Because of the presence of some of the birds in winter, it is difficult to fix the date when spring migration begins. This is indicated, however, by the records of birds striking the light on Sombrero Key, March 11 and 21, 1888, and March 24, 1889, and the

Pensacola Bay light at Warrington on March 22, 1885. The first migrants were reported at Pensacola, March 16, 1919, and March 22, 1925, and the birds were extremely abundant on one day—April 5, 1925. Late migrants of this race were taken at Key Largo, May 5, 1919, and Totten's Key, May 6, 1919. The last observed in fall were recorded at Tallahassee, October 15; Pensacola, November 16, 1924; and Fowey Rocks Light, October 22, 1903 (specimen). On October 13, 1885, 42 birds struck the light on Sombrero Key, 8 of which were killed.

HAUNTS AND HABITS.—Although most of the vireos dwell in the "upper stories" of the woodland, the White-eye prefers to live near the ground in dense thickets, usually in swamps or low, wet bottomlands, but often in Florida in dry "scrub" composed of palmetto or oak bushes. In such retreats the birds are often difficult to observe, but are easily located by their loud, vigorous notes. The song is strikingly unlike that of the other vireos—a sprightly and varied ditty, strongly accented, suggesting different translations to almost every listener. Ridgway renders it "*chick'ty-beaver, lim'ber, stick*", and Burroughs writes it "*chick-a-re'r-chick*". The birds when disturbed utter a mewing, scolding note, and at times they indulge in a medley of musical phrases, many of which seem to be imitations of other songsters.

The nests are hung in the forks of a bush, according to the usual vireo style, generally 3 or 4 feet above the ground. Maynard (1881, p. 80) describes a nest with 4 eggs found in Florida, May 8, 1872, as follows: "Composed of fragments of palmetto fronds, leaves, and Spanish moss, fastened together with spider's webs and lined with fine grasses." Nicholson noted a nest containing 3 slightly incubated eggs at Orlando, June 7, 1914. Grimes (1931a, p. 85) records a nest with four young near Jacksonville, May 4, 1930.

FOOD.—A study of the contents of 221 stomachs of the White-eyed Vireo by the Biological Survey (Chapin, 1925, pp. 21–23) showed the food to consist of about 88 per cent animal matter, chiefly insects. "Moths and butterflies and their larvae (caterpillars) make up slightly less than one-third of the food of this species and form the most important item of the diet. . . . As with other species of this family of birds, the white-eyed vireos prey heavily upon stink-bugs (Pentatomidae) at nearly all times. . . ." Scale insects (Coccidae) are eaten to a considerable extent. Beetles of all kinds compose 12.78 per cent of the total food, and wasps, bees, and flies 11.64 per cent. Grasshoppers are extensively eaten, particularly in the winter months. The vegetable food, amounting to nearly 12 per cent, consists of wild fruits, including those of the sumac, dogwood, wild grape, and wax myrtle.

KEY WEST VIREO: *Vireo griseus maynardi* Brewster

RECOGNITION MARKS.—Closely similar to the White-eyed Vireo, but *bill larger*.

RANGE.—Florida Keys; recorded from Key West, Boca Chica, Sugar Loaf, Big Pine, No Name, Knight, Grassy, Summerland, and Cudjoe Keys.

This race is best distinguished by its large bill; it differs, also, from the northern race in having the yellow of the sides averaging somewhat paler and less extensive; there is very little difference between the two forms in the color of the upperparts, although there is considerable individual variation in both.

HAUNTS AND HABITS.—The Key West Vireo is very similar in habits to its northern relative. The birds are apparently resident on the Keys, and are reported to sing more or less throughout the winter.

YELLOW-THROATED VIREO: *Vireo flavifrons* Vieillot

RECOGNITION MARKS.—Smaller and shorter bodied than the Red-eye (length, 5.5 to 6 inches; spread, 9.5 to 10 inches). Head and fore back yellowish oil green; *eye ring bright yellow;* rump and upper tail coverts neutral gray; *throat and breast bright yellow;* belly white; wings sooty drab, *with two white bars.* (Plate 52.)

RANGE.—Breeds from southeastern Saskatchewan, southern Manitoba, southern Ontario, southern Quebec, and southern Maine south to central Texas, central Louisiana, southern Alabama, and northern Florida. Winters from Yucatan and southern Mexico through Central America to Colombia. Casual in winter in Cuba and the Bahamas.

DISTRIBUTION IN FLORIDA.—Breeds commonly in the northern part, south at least to Brooksville; a migrant in other parts of the State. First arrivals in spring were recorded on the Tortugas, March 14, 1923; at Key West, March 23, 1896; Clearwater, March 17, 1929; Old Town, March 6, 1893; Daytona Beach, March 14, 1927; St. Marks, March 25, 1916; and Pensacola, March 22, 1885, and March 11, 1928. A late migrant was noted at Fakahatchee Island, May 10, 1919. The species has been reported during the breeding season at Waukeenah, St. Marks, Amelia Island, Boulogne (St. Marys River), Orange Park, New Smyrna, Glencoe, Gainesville, Silver Spring, Old Town, Branford, and Brooksville (specimen, May 20, 1929). South-bound migrants were observed at Orlando, September 9, 1912, and on the Tortugas, August 18, 1925. The latest seen in autumn were recorded at Pensacola, October 18, 1925 and 1926; Tallahassee, October 15, 1900; New Smyrna, October 11, 1925; and Key West, October 5, 1887.

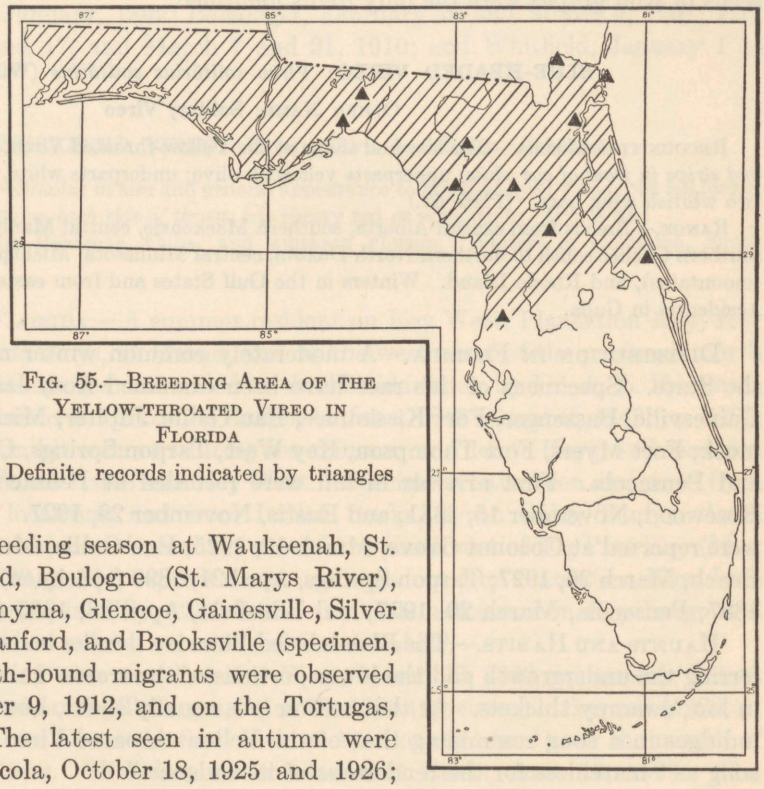

FIG. 55.—BREEDING AREA OF THE YELLOW-THROATED VIREO IN FLORIDA

Definite records indicated by triangles

HAUNTS AND HABITS.—The Yellow-throated Vireo usually makes its home in dry, deciduous woodland, but is occasionally found in cypress swamps or mixed river-bottom timber. It remains chiefly in the upper parts of the trees, singing at frequent intervals,

but not so continuously as does the Red-eye. The song is much like that of the Red-eye, but may be distinguished by the richer quality of its tone and by the upward inflection of some of the phrases. The nests are hung in the forks of a horizontal limb, 10 to 40 feet above the ground. They are composed of plant fibers, strips of bark, and similar material, lined with fine grasses, and decorated on the outside with lichens, plant down, and shreds of paper. Grimes (1931a, p. 85) mentions finding several nests in pine trees near Jacksonville, April 12 to 23, 1930, containing 3 and 4 eggs.

Food.—The food of this species as determined by Chapin (1925, pp. 15–18), consists almost wholly (95 per cent) of insects with a few spiders. Nearly half (42 per cent) of the total food is composed of butterflies and moths in their different stages, caterpillars being the most important items. Bugs are eaten to the extent of 23 per cent, two-thirds of these being of the stink-bug group. Beetles made up about 12 per cent of the yearly food; flies, 7 per cent; and Hymenoptera, 5 per cent. The vegetable food consumed was inconsiderable, amounting to less than 2 per cent of the total. Sassafras berries and seeds of wild grapes were the only items identified.

BLUE-HEADED VIREO: *Vireo solitarius solitarius* (Wilson)

Other Name: Solitary Vireo

Recognition Marks.—The size and shape of the Yellow-throated Vireo; *head neutral gray; eye ring and stripe in front of eye white;* upperparts yellowish olive; underparts white, the sides yellowish green; two whitish wing bars. (Plate 52.)

Range.—Breeds from central Alberta, southern Mackenzie, central Manitoba, central Ontario, and southern Quebec south to northern North Dakota, central Minnesota, Michigan, southern Pennsylvania (mountains), and Rhode Island. Winters in the Gulf States and from eastern Mexico to Guatemala. Accidental in Cuba.

Distribution in Florida.—A moderately common winter resident in all parts of the State. Specimens of this race have been examined from Jacksonville, Enterprise, Gainesville, Bassenger, Fort Kissimmee, Eau Gallie, Jupiter, Miami, Royal Palm Hammock, Fort Myers, Fort Thompson, Key West, Tarpon Springs, Cedar Keys, St. Marks, and Pensacola. First arrivals in fall were recorded at Pensacola, October 16, 1926; Rosewood, November 15, 1881; and Eustis, November 29, 1927. The last seen in spring were reported at Coconut Grove, March 12, 1925; Eau Gallie, March 14, 1910; Daytona Beach, March 26, 1927; Tarpon Springs, April 21, 1890 (specimen); Gainesville, April 11, 1887; Pensacola, March 20, 1927; and Whitfield, April 28, 1903 (specimen).

Haunts and Habits.—The Blue-headed Vireo is a dweller in deciduous woodland, preferring the undergrowth and the lower portions of the trees. In winter it is often found in low, swampy thickets. At that season it is usually silent, but in its summer home it indulges in a song resembling that of the Yellow-throated Vireo. Torrey describes its song as "matchless for the tenderness of its cadence."

Food.—The Blue-headed Vireo consumes a larger percentage of vegetable matter than the Yellow-throat, but less than the Red-eye. The vegetable food is taken chiefly in the winter months, and consists of fleshy fruits, including wild grapes and berries of the dogwood, viburnum, and wax myrtle. The animal food amounts to 96 per cent of the total, and is composed almost entirely of insects, with a few spiders and snails. Cater-

pillars and moths are favorite foods, comprising 31 per cent of the total. Bugs form the second largest item (20 per cent), being mainly of the stink-bug family. Beetles are consumed to the extent of 13 per cent of the total food, of which ladybird beetles form the largest item. Other insects taken in smaller quantities are Hymenoptera, Diptera, dragon flies, grasshoppers, crickets, and locusts. (Chapin, 1925, p. 18.)

MOUNTAIN VIREO: *Vireo solitarius alticola* Brewster

RECOGNITION MARKS.—Similar to the Blue-headed Vireo, but *bill larger;* head and back chiefly neutral gray, with very slight olive tinge.

RANGE.—Breeds in the mountains from West Virginia south to northern Georgia. Winters in the lowlands from South Carolina to Florida.

DISTRIBUTION IN FLORIDA.—A winter resident in the northern and central parts. Specimens of this race have been taken at St. Marks, January 2, 1920; Old Town, February 22, 1893; Gainesville, March 8, 1887; Tarpon Springs, January 10, 1890; Fort Myers, December, 1891, and January, 1892; Bassenger, February 26 and March 9, 1907; Eau Gallie, February 10 and 17, and March 7 and 21, 1910; and Whitfield, January 1 to March 9, 1903.

BLACK-WHISKERED VIREO: *Vireo calidris barbatulus* (Cabanis)

RECOGNITION MARKS.—Similar in size and general appearance to the Red-eyed Vireo, but *bill larger; a narrow stripe of sooty drab on each side of throat;* iris cherry red or wine color. (Plate 44.)

RANGE.—Breeds in the Bahamas, Cuba, and southern Florida. Winters in Colombia, South America.

DISTRIBUTION IN FLORIDA.—A summer resident on Key West, Plantation Key, Key Largo, and other Florida Keys, at Miami, and on the west coast of the peninsula north to Pasco County. This species was added to the Florida fauna by Dr. A. L. Heerman, who took several specimens at Charlotte Harbor in June, 1848 (Gambel, 1848b, p. 127). Scott (1890a, p. 14) found it common during the summer on Anclote Keys, and recorded it also as breeding at Punta Rassa and Key West. Specimens have been examined from the above-mentioned localities, and from Indian Rocks, Seven Oaks, Tampa, Anna Maria Key, Ten Thousand Islands, and the second key southwest of Big Pine Key (May 12, 1919). Squiers (1929, p. 394) reports a nest and eggs found on Plantation Key, June 10, 1927. T. D. Burleigh, in May, 1931, found the birds numerous on Key Largo and observed a singing male on several occasions at Coral Gables.

First arrivals in spring were noted at Key West, March 27, 1896 (specimen); Palma Sola, April 20, 1913; and on the Tortugas, April 29, 1890 (specimen). Buswell (1929, p. 22) mentions seeing a bird about the first week in April on an island near the mouth of the Caloosahatchee River. Nicholson observed one at Elfers, June 16, 1929. The last seen in fall were recorded at Punta Rassa, September 5, 1886, and Key West, September 13, 1887.

HAUNTS AND HABITS.—The Black-whiskered Vireo resembles the Red-eyed Vireo very closely in appearance and habits. The birds are found mainly in the mangroves along the shores of the bayous, though they occasionally visit the uplands. I collected

one specimen from the top of a large oak in a creek bottom at Seven Oaks, a mile or more from Old Tampa Bay. The birds are deliberate in their movements and not shy. Their song, which I heard a number of times, resembles that of the Red-eye rather closely, but is shorter, less smoothly flowing, and distinguished by the recurrence of two rather abrupt phrases, suggesting a trill.

R. D. Hoyt said that the birds breed only in the mangroves. Baynard (1914g, pp. 473–474) furnishes an excellent photograph and description of a nest found near Clearwater early in June. This was hung in the usual vireo style in a mangrove, about 5 feet above the water, and was composed entirely of dry seaweed, with a few pieces of palmetto fiber and one small feather woven in the side, and lined with fine dry grass and one or two pine needles. The eggs, 3 in number, were sparsely spotted, and apparently similar to those of the Red-eyed Vireo.

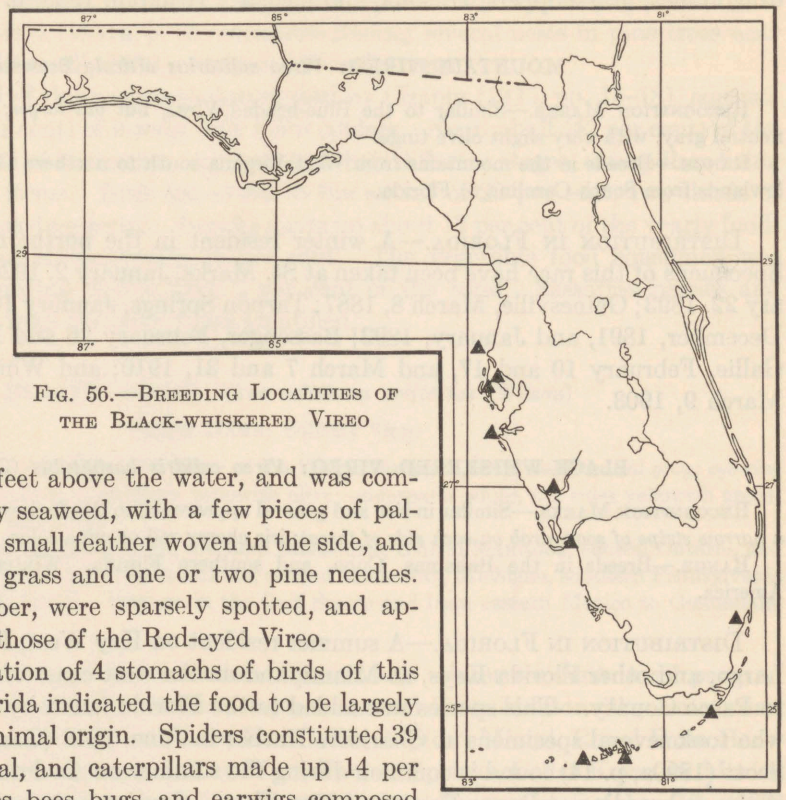

FIG. 56.—BREEDING LOCALITIES OF THE BLACK-WHISKERED VIREO

FOOD.—Examination of 4 stomachs of birds of this species taken in Florida indicated the food to be largely (87.5 per cent) of animal origin. Spiders constituted 39 per cent of the total, and caterpillars made up 14 per cent. Beetles, wasps, bees, bugs, and earwigs composed the remainder of the animal food. The vegetable food consisted of the fruit of barberry and ragweed (Chapin, 1925, p. 3).

RED-EYED VIREO: *Vireo olivaceus* (Linnaeus)

RECOGNITION MARKS.—Larger and longer bodied than most of the other vireos and most of the warblers (length, 5.75 to 6.25 inches; spread, 9.75 to 10.75 inches). Top of head neutral gray; rest of upperparts dull citrine (olive); underparts white; wings and tail hair brown, shaded with olive. (Plate 52.)

RANGE.—Breeds from central British Columbia, southern Mackenzie, and northern Ontario south to southeastern Washington, southern Montana, western Texas, northern Mexico (Coahuila), southern Alabama, and central Florida. Winters in South America from Colombia to southern Brazil.

DISTRIBUTION IN FLORIDA.—The Red-eyed Vireo is common in the breeding season over the greater part of northern and central Florida as far south, at least, as Istokpoga Lake in the interior and Brooksville on the west coast. The species has been recorded

in the breeding season on the lower Apalachicola and Aucilla Rivers, at Waukeenah, Gainesville, Old Town, Orange Park, Fernandina, New Smyrna, Homosassa, Tarpon Springs, Sebring, Deer Park, Illahaw, Istokpoga Lake, and numerous other places. A few singing birds were noted at Deep Lake, March 22 to 27, 1919, and at Immokalee, April 15, 1919; probably they breed sparingly in those localities.

The first migrants in spring appeared on the Dry Tortugas, March 14, 1923; at Daytona Beach, March 12, 1925; Wekiva River, March 20, 1877; Whitfield, March 19, 1903; Pensacola, March 18, 1928; Amelia Island, March 23, 1906; and St. Marks, April 1, 1909. A few birds struck the light on Sombrero Key on March 23, 1887, April 25, 1887, May 9, 1888, and March 24, 1889; and a few autumn migrants struck it on October 16, 1885, October 12, 1887, and October 9, 1888. The fall migration, however, begins much earlier than this, for several birds were observed on the Tortugas, August 13 to 24, 1925, and at Coconut Grove, August 29 to 31, 1929. The last migrants noted in fall were recorded at Tallahassee, October 16, 1904; De Funiak Springs, October 9, 1908; Orlando, October 16, 1909; St. Marks, October 26, 1913; and Pensacola, October 14, 1928.

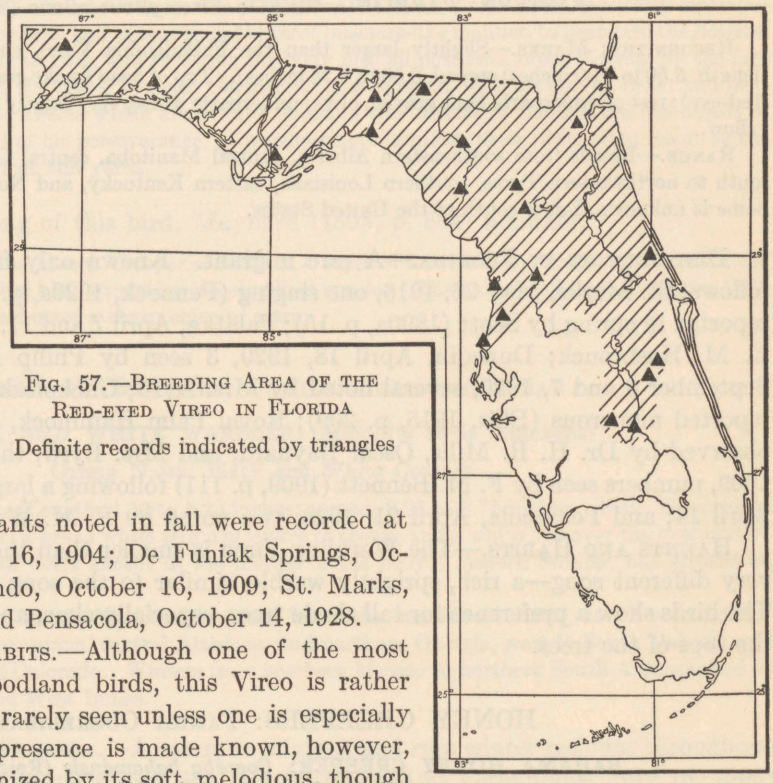

FIG. 57.—BREEDING AREA OF THE RED-EYED VIREO IN FLORIDA

Definite records indicated by triangles

HAUNTS AND HABITS.—Although one of the most abundant of the woodland birds, this Vireo is rather inconspicuous and is rarely seen unless one is especially looking for it. Its presence is made known, however, and it is easily recognized by its soft, melodious, though monotonous, song, which it renders almost continuously throughout the entire day during the greater part of its stay in its summer home. It gleans its food mainly from the higher limbs of deciduous trees, in the South having a partiality for heavy bottomland timber and the river swamps. Its cup-shaped nest is skillfully woven of strips of bark, plant down, dry leaves, and shreds of paper, and is hung by its rim to the forks of a horizontal limb, often within 4 or 5 feet of the ground, but sometimes as high as 25 feet. Grimes (1931a, p. 84) mentions finding, near Jacksonville, a new nest on May 5, one with 3 eggs on May 13, and one just started on May 13.

FOOD.—Recent studies of the food habits of this Vireo by Chapin (1925, pp. 4-10) have shown it to be a decidedly beneficial species. Examination in the Biological Survey

of 569 stomachs showed the food to consist of animal matter (nearly all insects), 85.28 per cent, and vegetable matter (mostly fleshy fruit and berries), 14.72 per cent. Of the insects eaten, caterpillars formed the largest amount, about 32 per cent. Beetles composed 10.8 per cent of the food, stink bugs, 7 per cent, Hymenoptera (ants, bees, and wasps), about 8 per cent, and grasshoppers and similar insects, about 5 per cent. The vegetable food taken consisted of mulberries, blackberries, elderberries, currants, blueberries, grapes, and the fruit of the spice bush, cornel (various species), bay, Virginia creeper, and sassafras.

EASTERN WARBLING VIREO: *Vireo gilvus gilvus* (Vieillot)

Recognition Marks.—Slightly larger than the Philadelphia Vireo, smaller than the Red-eye; (length, 5.50 to 6.00 inches; spread, 8.50 to 9.25 inches). Top of head smoke gray (much paler than in the Red-eye); rest of upperparts light grayish olive; underparts white, very faintly washed on sides with pale yellow.

Range.—Breeds from southeastern Alberta, central Manitoba, central Ontario, and Nova Scotia south to northwestern Texas, southern Louisiana, eastern Kentucky, and North Carolina. Its winter home is unknown, but is south of the United States.

Distribution in Florida.—A rare migrant. Known only from sight records, as follows: St. Marks, May 26, 1916, one singing (Pennock, 1920a, p. 53); Tarpon Springs, reported in spring by Scott (1890a, p. 15); Palatka, April 7 and 11, 1885, several seen by E. M. Hasbrouck; Dunedin, April 18, 1929, 3 seen by Philip A. DuMont; Oxford, September 6 and 7, 1920, several noted by Mrs. Byrd; Chokoloskee, October 11, 1915, reported numerous (Ellis, 1915, p. 209); Royal Palm Hammock, January 7, 1917, one observed by Dr. H. R. Mills, Oscar Baynard, and Mrs. Byrd; the Tortugas, April 20, 1909, numbers seen by F. M. Bennett (1909, p. 111) following a large migratory flight on April 14; and Pensacola, April 21, 1928, two noted by F. M. Weston.

Haunts and Habits.—The Warbling Vireo is smaller than the Red-eye, and has a very different song—a rich, sprightly warble, similar to the song of the Purple Finch. The birds show a preference for tall shade trees, especially elms, and remain mostly near the tops of the trees.

HONEY CREEPERS: Family Coerebidae

BAHAMA HONEY CREEPER: *Coereba bahamensis* (Reichenbach)

Recognition Marks.—About the size of the Carolina Wren (length, 4.50 to 5.00 inches; tail, 1.75 to 1.90 inches); *bill much curved and sharp-pointed.* Upperparts fuscous-black; *a white stripe over the eye;* underparts ashy white, the breast bright yellow; tail fuscous-black, with white patches at tip.

Range.—Bahamas; accidental in Florida.

Distribution in Florida.—Accidental on the east coast; known from four records, as follows: A specimen in the United States National Museum collection was taken on Indian Key, January 31, 1858, by G. Würdemann (Baird, Cassin, and Lawrence, 1858, p. 924).[1] The bird was said by the collector to be "not at all rare," but none have since

[1] This specimen was later made the type of *Certhiola bairdii* Cabanis (1866, p. 412)—not now recognized as distinct.

been discovered at that location. Henninger (1917, p. 3) records a specimen taken at Fort Capron, February 11, 1874, by Erwin I. Shores. J. T. Nichols (1921, p. 461) records a single bird observed by him at close range at Miami Beach, February 7, 1921, and H. H. Bailey (1925a, p. 121) mentions having seen a bird near Cape Sable in May, 1922.

HAUNTS AND HABITS.—Writing of the Honey Creepers of Jamaica, Gosse (1847, p. 84) says:

> Scarcely larger than the average size of the Humming-birds, this little Creeper is often seen in company with them, probing the same flowers, and for the same purpose, but in a very different manner. Instead of hovering in front of each blossom, a task to which his short wings would be utterly incompetent, the Quit alights on the tree, and proceeds, in the most business-like manner, to peep into the flowers, hopping actively from twig to twig, and throwing the body into all positions, often clinging by the feet with the back downwards, the better to reach the interior of a blossom, with his curved beak, and pencilled tongue. The minute insects which are always found in the interior of flowers, are the object of his search, and the reward of his perseverance. Unsuspectingly familiar, these birds often resort to the blossoming shrubs of gardens and yards.

Concerning the song of this bird, Maynard (1895, p. 564) remarks:

> The song of the Bahama Honey Creeper consists of a series of low crackling notes, quite unlike the sounds emitted by any other bird, excepting closely allied species. They also produce a chattering with the bill when disturbed and utter a sharp chirp of alarm.

WOOD WARBLERS: FAMILY COMPSOTHLYPIDAE

BLACK AND WHITE WARBLER: *Mniotilta varia* (Linnaeus)

OTHER NAME: **Black and White Creeper**

RECOGNITION MARKS.—Length, 4.50 to 5.25 inches; spread, 8.25 to 8.75 inches. *Male:* Upperparts black, streaked with white; a broad white stripe in center of crown, and a white line over the eye; underparts white, streaked with black except in the middle of the belly. *Female:* Similar, but streaks on underparts mouse gray.

RANGE.—Breeds from central Mackenzie, central Manitoba, northern Ontario, and Newfoundland south to eastern Texas, Louisiana, central Alabama, and northern Georgia, west to South Dakota, and casually to Wyoming and Colorado. Winters from northern Mexico to northern South America, and in Florida, the Bahamas, and West Indies.

DISTRIBUTION IN FLORIDA.—A common migrant and rare winter resident throughout the State. The first migrants from the North appeared at Fernandina, July 16, 1906; St. Marks, July 21, 1915; Pensacola, July 29, 1928; Coronado, August 2, 1909; Orlando, July 28, 1910; Palma Sola, July 9, 1912, and July 20, 1920; Sombrero Key, August 10, 1886; Sand Key Light, August 13, 1902; and on the Tortugas, August 19, 1925. Eleven birds struck the lighthouse on Fowey Rocks, August 22, 1889. At Sombrero Key, small numbers were reported striking the light on numerous dates from September 12 to October 11; also on November 4, 10, and 14. On October 9, 1885, during a northeast storm, 200 birds struck the lighthouse, 25 of which were killed.

Wintering birds have been reported at Lake Iamonia, December 28, 1921; East Goose Creek, December 30, 1921; New Smyrna, January 28, 1922; Old Town, February 13, 1893; Zephyrhills, December 25, 1922; Fort Myers, January 6, 1892; Kissimmee, Jan-

uary 21, 1901; Tarpon Springs, January 15, 1890; Orlando, February 2, 1909; Coconut Grove, January 15, 1925; and Key West, January 15, 1885. Single birds seen at Pensacola, February 21, 1926, and on Amelia Island, February 26, 1916, very likely had wintered in those regions.

The period of spring migration is well indicated by the records from Sombrero Key Light and from the Tortugas. At Sombrero Key, in 1889, 15 birds struck the light on March 3, 13 on March 11, and 14 on April 3; also smaller numbers on March 7 and 10, and April 18 and 26 (different years). On the Tortugas, specimens were taken on many different dates from March 13 to April 28, 1890, and the last were observed on May 2. On the mainland the first migrants were reported at De Land, March 20, 1912, and the last were seen at Princeton, May 2, 1915; Fakahatchee Island, May 14, 1916; Seven Oaks, May 18, 1902; and Orlando, May 21, 1909.

HAUNTS AND HABITS.—The Black and White Warbler is a bird of the deciduous forests, where it lives chiefly on the trunks and lower limbs of the trees. It climbs about after the manner of the creepers, clinging with ease to the under side of the branches, and searching the crevices in the bark for its insect prey. Its song, though not loud, is penetrating and easily recognized. Owing to their quiet habits the birds attract little attention.

FOOD.—This Warbler is reported to feed on wood-boring insects, bark beetles, click beetles, curculios, caterpillars, and moths. Forbush (1907, p. 192) says it consumes large numbers of hairy caterpillars. It is considered a highly beneficial species.

PROTHONOTARY WARBLER: *Protonotária citrea* (Boddaert)

OTHER NAME: **Golden Swamp Warbler**

RECOGNITION MARKS.—Length, 5.30 to 5.50 inches; spread, 8.50 to 9.00 inches; bill black, nearly straight. *Male:* Head, throat, and underparts bright orange-yellow; fore back citrine (olive); rump, wings, and tail slate-gray, the tail feathers (except middle pair) with white subterminal patches; no wing bars. *Female:* Similar to male, but yellow of underparts paler and head more dusky. (Plate 53.)

Range.—Breeds from northeastern Nebraska, southeastern Minnesota, southern Wisconsin, southern Michigan, Ohio, and central Delaware south to northern Florida, southern Alabama, and eastern Texas. Winters from Nicaragua to Colombia and Venezuela. Accidental in the West Indies; casual north to New England and New Brunswick, and west to Arizona.

DISTRIBUTION IN FLORIDA.—A locally common summer resident in the northern and central parts, and a fairly common migrant throughout the State. It breeds commonly in the big swamps on the Escambia, Apalachicola, and Aucilla Rivers; also at Whitfield, St. Marks, Tallahassee, Cherry Lake, Greenville, De Leon Springs, Daytona (8 miles west), Maytown, San Mateo, Wekiva River, Lake Gentry, Orlando (11 miles east), Kissimmee (8 miles southwest), Istokpoga Creek, Panasoffkee Lake, Padgett Creek (near Blue Cypress Lake), and doubtless at other places.

First migrants in spring were reported on Sombrero Key, March 11, 1888; Caloosahatchee River, March 5, 1912; lower Suwannee River, March 22, 1890; Palatka, March 25, 1885; Whitfield, March 23, 1903; and Warrington, March 21, 1885 (numerous March 22 and 26 at the lighthouse). Scott (1890a, p. 16) records the species as an uncommon migrant at Tarpon Springs, passing in spring from March 30 to the latter part of April,

and in fall from the last of July to September 20. He reports it, also, at Punta Rassa, August 28 and 29, and September 13 and 17, 1886; and at Key West, April 6 and 11, and July 28, 1888, and August 8, 1889. One bird struck the lighthouse on Sombrero Key, September 25, 1888, and one was noted on the Tortugas, April 6, 1890. Mrs. Hiram Byrd reported one at Royal Palm Hammock, December 24, 1917, this being the only winter record.

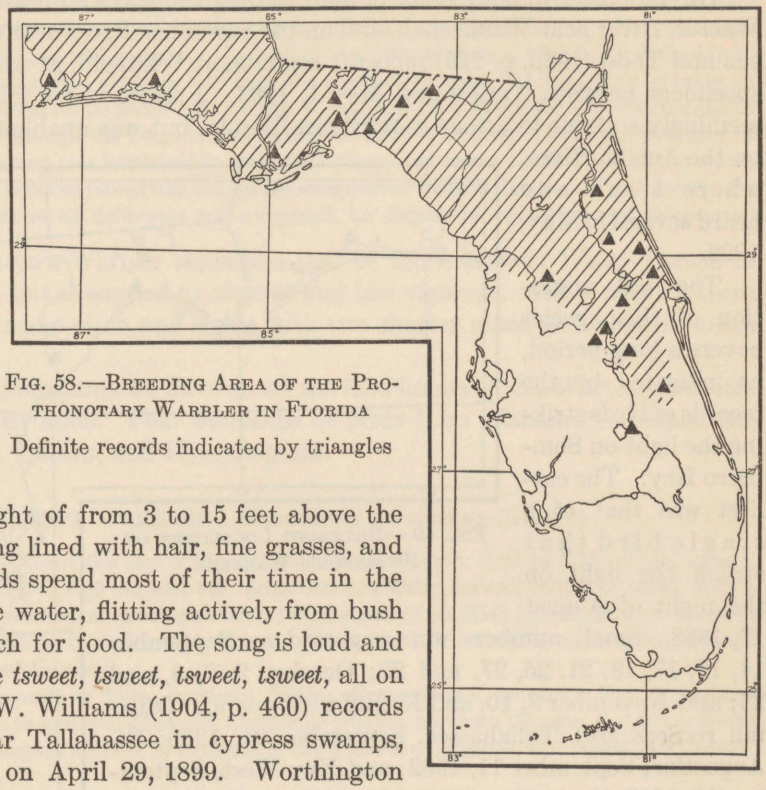

FIG. 58.—BREEDING AREA OF THE PROTHONOTARY WARBLER IN FLORIDA

Definite records indicated by triangles

HAUNTS AND HABITS.—This brilliant Warbler is a lover of wet river bottoms and timbered swamps, where there are dead or decayed stubs standing in or near the water. The nests are placed in holes in these stubs, at a height of from 3 to 15 feet above the water, the cavity being lined with hair, fine grasses, and moss fibers. The birds spend most of their time in the undergrowth near the water, flitting actively from bush to bush in their search for food. The song is loud and penetrating—a simple *tsweet, tsweet, tsweet, tsweet,* all on the same pitch. R. W. Williams (1904, p. 460) records two nests, found near Tallahassee in cypress swamps, one containing eggs, on April 29, 1899. Worthington and Todd (1926, p. 223) collected a set of 5 fresh eggs at Whitfield, April 29, 1903; and eggs were taken at San Mateo, April 18, April 28, and May 5; Fred W. Walker took a set of 3 heavily incubated eggs near Kissimmee, May 12, 1922.

SWAINSON'S WARBLER: *Limnóthlypis swâinsoni* (Audubon)

RECOGNITION MARKS.—About the size of the Prothonotary Warbler (length, 5.5 to 6.5 inches; spread, 8.70 to 9.10 inches; tail, 1.80 to 2.00 inches); bill light brown, nearly straight, sharp-pointed. Top of head snuff brown; rest of upperparts brownish olive; a yellowish white line over the eye; underparts dull yellowish white, shaded with grayish olive; wings and tail olive-brown, without white markings. (Plate 53.)

RANGE.—Breeds from southeastern Missouri, southern Illinois, southern Indiana, and southeastern Virginia south to eastern Texas, Louisiana, southern Alabama, and northern Florida. Winters in Jamaica. Migrates through Cuba and the Bahamas. Casual in Nebraska and Vera Cruz.

DISTRIBUTION IN FLORIDA.—Breeds in the big river swamps of northwestern Florida south at least to the lower Suwannee River; rare in migration elsewhere in the State, but

a regular migrant on Sombrero Key, off the southern coast. Specimens were taken on the Tortugas, March 25 and April 5, 1890; Sombrero Key, April 3, 1889; lower Suwannee River, March 22, 1890; at Tarpon Springs, April 17, 1890; on Amelia Island, April 19 and 27, 1906; and the Aucilla River, March 29 and April 2, 1905.

Wayne (1893, p. 338; 1895, p. 365) records the species breeding abundantly on the Wacissa River near Waukeenah, and on the Suwannee River near Old Town. Worthington and Todd (1926, p. 223) report it common at Whitfield, at which place they took 20 specimens between April 4 and May 1, 1903. I searched for this bird at a number of seemingly suitable locations in northern Florida, but was unable to discover any except on the Aucilla River, where I saw and heard several in May, 1926.

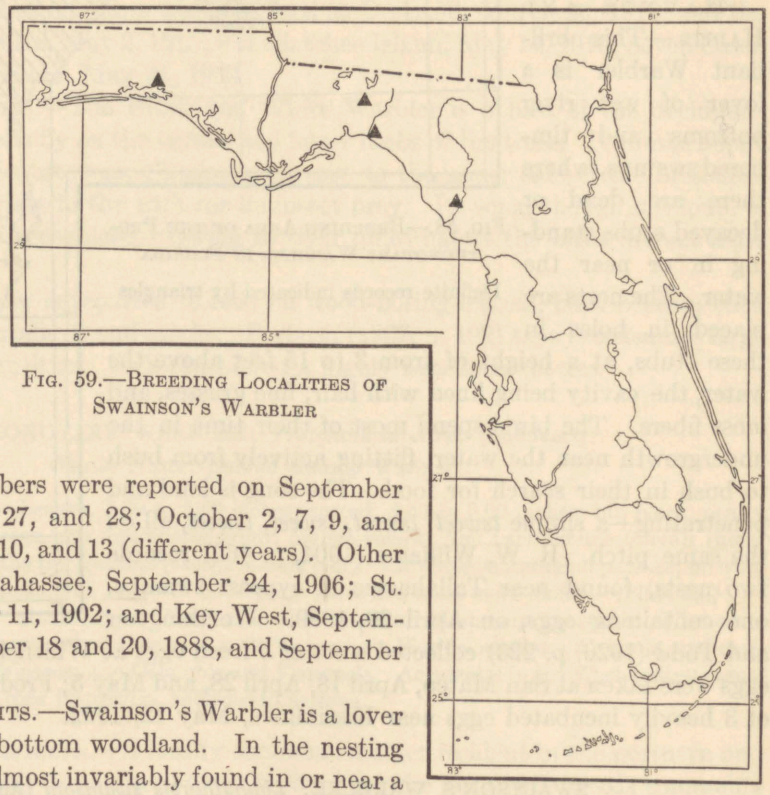

FIG. 59.—BREEDING LOCALITIES OF SWAINSON'S WARBLER

The fall migration of this species covers a long period, as indicated by the records of birds striking the light on Sombrero Key. The earliest was that of a single bird that struck the light on the night of August 17, 1888. Small numbers were reported on September 14, 16, 17, 18, 21, 25, 27, and 28; October 2, 7, 9, and 26; and November 8, 10, and 13 (different years). Other fall records are: Tallahassee, September 24, 1906; St. Augustine, September 11, 1902; and Key West, September 20, 1887, September 18 and 20, 1888, and September 15, 1889.

HAUNTS AND HABITS.—Swainson's Warbler is a lover of swamps and river bottom woodland. In the nesting season the birds are almost invariably found in or near a growth of cane (*Arundinaria tecta*), and their nests are usually fastened in the upper branches of the cane stalks, from 2 to 8 feet above the ground, although sometimes they may be in small bushes or vines. The nests, which are bulky, are loosely constructed of dead leaves and lined with pine needles or Spanish moss. The eggs, commonly 3 (sometimes 4) in number, are normally pure white, but occasionally are spotted with reddish brown, as shown by several sets in the United States National Museum. According to Wayne (1910, p. 149), two broods are raised in a season, eggs having been taken by him in South Carolina from April 28 to July 6. At Waukeenah, Florida, he collected a set on May 7, 1894.

This Warbler, owing to its shy and retiring habits and to the inaccessible nature of

its haunts, is one of the most difficult of our small birds to locate, and is well known to only a few ornithologists. Brewster (1885, p. 65), who made a special study of its habits, writes as follows:

> When not singing Swainson's Warbler is a silent, retiring bird, spending nearly his entire time on the ground in the darkest recesses of his favorite swamps, rambling about over the decaying leaves or among the rank water-plants in search of the small beetles which constitute his principal food. His gait is distinctly a walk, his motions gliding and graceful. Upon alighting in the branches, after being flushed from the ground, he assumes a statuesque attitude, like that of a startled Thrush. While singing he takes an easier posture, but rarely moves on his perch. If desirous of changing his position he flies from branch to branch instead of hopping through the twigs in the manner of most Warblers. Under the influence of excitement or jealousy he sometimes jets his tail, droops his wings, and raises the feathers of the crown in a loose crest, but the tail is never jerked like that of a *Geothlypis*, or wagged like that of a *Seiurus*. On the contrary, his movements are all deliberate and composed, his disposition sedentary and phlegmatic.

The song of Swainson's Warbler resembles that of the Louisiana Water-Thrush in form and tone quality, but is somewhat shorter and less vigorous. It opens with three slurred phrases on the same pitch and closes with two shorter notes on a slightly lower pitch.

Food.—The little information we have about the food habits of this Warbler indicates that it is wholly insectivorous. Four stomachs of birds from Alabama contained the remains of caterpillars, spiders, and Hymenoptera.

WORM-EATING WARBLER: *Helmitheros vermivorus* (Gmelin)

Recognition Marks.—About the size of the Carolina Wren (length, 5.00 to 5.75 inches; spread, 8.10 to 8.75 inches; tail, 1.85 to 2.00 inches); bill rather stout, slightly curved; center of crown with a broad stripe of olive-buff bordered on each side with a broad stripe of blackish brown; another blackish streak through the eye; upperparts citrine-drab (olive); underparts soiled whitish, more or less washed with dull ochraceous-buff or olive-buff.

Range.—Breeds from southern Iowa, northern Illinois, Pennsylvania, southern New York, and southern Connecticut south to southern Missouri, northern Alabama, northern Georgia, and upper South Carolina. Winters from Chiapas, Mexico, to Panama, in Cuba and the Bahamas, and casually in Florida.

Distribution in Florida.—A regular but uncommon migrant in spring and fall, a few remaining all winter. First arrivals in spring were recorded on Sombrero Key, April 3, 1889; Tortugas, April 5, 1890; at Tarpon Springs, March 28, 1887; Old Town, April 4, 1892; Palatka, April 7, 1885; Daytona Beach, April 11, 1928; and Pensacola, April 5, 1925. Considerable numbers struck the light on the Tortugas, April 14, 1909, and many remained until April 20. Several birds struck the light on Sombrero Key, May 8, 1888. Others were reported at Fernandina, May 4, 1907; Seven Oaks, May 14, 1902; and Coronado, May 9, 1910.

In the fall migration, the first birds were noted on the Tortugas, August 23, 1925, at Coronado, August 30, 1908, and 1923; Orlando, September 2, 1914; Palma Sola, September 9, 1912; Fowey Rocks Light, August 31, 1902; and Key West, August 26, 1895. Large numbers were reported at the St. Augustine Light during the nights just previous to September 11, 1902. A few birds struck the light on Sombrero Key on September 15, 16, 18, and 19, 1887, and 6 birds on September 25, 1888. The latest record for fall migration is October 3, 1906, at Fernandina. A few of the birds winter, however, as indi-

cated by records at Amelia Island, December 28, 1906; Gainesville, December 26, 1887; and Blue Spring, January 25.

HAUNTS AND HABITS.—The Worm-eating Warbler dwells during the summer in heavy, moist, deciduous woodland, usually choosing a hillside near a small stream. It spends most of its time on or near the ground, *walking* about with its tail held up at a jaunty angle above the back. Occasionally a bird will fly up to one of the limbs of a tree, 15 or 20 feet above the ground, and deliver its simple, trilling song, which is much like that of the Chipping Sparrow, but less vigorous. The alarm note of the Worm-eater is a sharp *dzt* like that of Swainson's Warbler.

FOOD.—The stomachs of three individuals taken in Florida in April contained small grasshoppers, caterpillars, sawfly larvae, beetles, and spiders. One dragon fly, one bumblebee, and one "walking stick" were also included in the contents.

GOLDEN-WINGED WARBLER: *Vermivora chrysóptera* (Linnaeus)

RECOGNITION MARKS.—About the size of the Blue-winged Warbler. *Adult male:* Forehead wax yellow; *throat and sides of head black,* with a white streak over the eye and another broader one on each side of throat; belly white; upperparts slate-gray; wings hair brown, *with large yellow patches* on the greater wing coverts. *Adult female:* Crown yellowish green (warbler green of Ridgway), tinged with yellow on forehead; *throat and sides of head neutral gray;* back neutral gray, washed with greenish olive.

RANGE.—Breeds from central Minnesota, southern Ontario, and Massachusetts south to southern Iowa, northern Illinois, northern Indiana, northern New Jersey, and in the mountains to northern Georgia. Winters from southern Mexico to Colombia. Accidental in Cuba.

DISTRIBUTION IN FLORIDA.—A very rare migrant in spring and fall. Known from the following records: Seven Oaks, two specimens (without date) in the collection of the Florida State Museum, taken by R. D. Hoyt; Key West, August 25, 1889, one adult female taken by Atkins (Scott, 1890a, p. 17); Palma Sola, September 9, 1912, two seen by Miss Eleanor Earle; and Pensacola, September 9, 1923, one seen by F. M. Weston.

HAUNTS AND HABITS.—In its summer home, this Warbler inhabits the more open parts of the deciduous forests, showing a preference for brushy pastures and dry hillsides covered with second-growth sprouts.

BLUE-WINGED WARBLER: *Vermivora pinus* (Linnaeus)

OTHER NAME: **Blue-winged Yellow Warbler**

RECOGNITION MARKS.—About the size of the Maryland Yellowthroat (length, 4.50 to 5.00 inches; spread, 6.85 to 7.50 inches); bill straight, sharp-pointed. *Male:* Forehead and part of crown deep yellow (primuline yellow of Ridgway); a black line through the eye; upperparts warbler green (yellowish green) underparts lemon chrome; wings deep mouse gray, with prominent white patches; tail deep neutral gray, with white inner webs on all but the central feathers. *Female:* Similar to the male, but yellow of underparts paler and crown greenish rather than yellow.

RANGE.—Breeds from southeastern Missouri, southern Michigan, western New York, and Massachusetts south to Kansas, Missouri, Kentucky, and northern Georiga. Winters from southern Mexico to Colombia. Accidental in the Bahamas.

DISTRIBUTION IN FLORIDA.—A rare migrant in spring and fall. Scott took 5 specimens on the Tortugas, March 23 to 25, 1890. Other spring records are as follows: Sandy

Key, April 16, 1917; Miami, April 22, 1911; Sanibel Island (3), April 9, 1902; Whitfield, April 24, 1903; and Pensacola, April 24, 1928. In the fall migration, one specimen was taken at Key West, August 30, 1887, and one at St. Marks, October 9, 1919.

HAUNTS AND HABITS.—The Blue-winged Warbler in its summer home frequents clearings in deciduous woodland, shrubby second-growth tracts, and sometimes swampy thickets. It is a shy, retiring bird, nesting on the ground and living mainly in tall bushes and in the lower branches of the trees. The song, delivered from a rather elevated perch, is a short and feeble utterance with a characteristic, insectlike quality. "He seems to inhale a shrill *zre-e-e-e-e-e* and immediately exhale a buzzing *zwe-e-e-e-e-e*, the whole performance comprising a perfect double run through about half an octave of the scale" (Jones, in Chapman, 1907b, p. 70).

BACHMAN'S WARBLER: *Vermivora bâchmani* (Audubon)

RECOGNITION MARKS.—Smaller than the Maryland Yellowthroat (length, 4.25 to 4.50 inches); bill shorter than head, nearly straight, sharp-pointed. *Adult male: Forehead,* eye ring, chin, and belly bright yellow (strontian yellow); crown and nape neutral gray, the fore part of crown more or less spotted with black; back yellowish citrine (olive); *a black patch on the chest;* wings and tail hair brown, the tail feathers with subterminal white patches. *Adult female:* Similar to the male, but without black on chest or head; breast shaded with pale neutral gray; white markings on tail much reduced. (Plate 53.)

RANGE.—Breeds in southeastern Missouri, northeastern Arkansas, western Kentucky, Alabama, and the coast region of South Carolina (possibly in North Carolina and southern Indiana). Winters in Cuba. Occurs in migration in Florida, Alabama, Mississippi, and Louisiana. Casual in Virginia and the Bahamas.

DISTRIBUTION IN FLORIDA.—A common spring and fall migrant; apparently most numerous on the Keys and in the deep river swamps of northern Florida. Described by Audubon from specimens taken in South Carolina in 1833 by Doctor Bachman, this Warbler remained almost unknown for more than half a century. In 1886 and 1887, migrating specimens were taken in southern Louisiana by a millinery collector, and in March and April, 1887, M. E. Spencer, keeper of the lighthouse on Sombrero Key, sent to Dr. C. Hart Merriam several birds killed by striking the light. On August 30, 1887, J. W. Atkins collected a specimen at Key West, and during July and August of the two following years he found the birds common there, taking in 1889 more than 40 specimens (Scott, 1888d, p. 428; 1890a, p. 17). In the spring of 1890, William Brewster and Frank M. Chapman reported this Warbler abundant on the lower Suwannee River, where, between March 12 and 24, they took 46 birds (Brewster, 1891, pp. 149–157).

Bachman's Warbler is a very early migrant, the earliest record in the United States being that of a male collected by A. H. Helme at Lukens, February 27, 1909. Other dates of first arrivals are: Sombrero Key, March 3, 1889 (20 females and 1 male striking the light); Tortugas, March 26, 1890; Miami, March 7, 1901; Micco, March 21, 1889; St. Johns River, near Titusville, March 4, 1905; Old Town, March 10, 1893; Fenholloway River, March 11, 1907; Wacissa River, March 13, 1894; and Whitfield, March 9, 1903. The last seen in spring were reported on the Tortugas, April 9, 1890; Sombrero Key, April 3, 1889 (5 struck the light); and at Branford, April 2, 1892.

In the fall migration Atkins noted the first arrivals at Key West on July 17, and others on July 23 and 31 (1889). The birds were common throughout August, and the last

was seen on September 5 (1888). On August 6, 1888, and again on August 8, 1889, he observed 25 or 30 birds (Scott, 1888d, p. 429; 1890a, p. 17). The only mainland records in autumn are from Tallahassee, August 4, 1900 (specimen), and Gotha, where Nehrling reported the birds quite abundant in August, 1905.

HAUNTS AND HABITS.—During the spring migration, in the big swamps along the Suwannee River, Brewster and Chapman found the birds frequenting the tops of the tallest trees, chiefly cypresses, and Wayne reported the same habit on the bird's breeding grounds in South Carolina. As I observed the birds in the breeding season at numerous points in southeastern Missouri and Alabama, the males usually sang from the lower limbs of the trees, 15 or 20 feet above the ground. These are preeminently swamp-loving birds, inhabiting the heavy hardwood timber in the bottomlands or deep cypress swamps in which the water is often several feet deep, at least in spring. The birds are inconspicuous because of their small size and rather faint song—a short, buzzing trill, rapidly repeated without change of pitch, resembling the song of the Worm-eating Warbler, but with the quality of the Parula's song.

FOOD.—Little is known of the food habits of this species. Five stomachs of birds taken in Alabama contained the remains of caterpillars and a few fragments of Hymenoptera, probably ants.

TENNESSEE WARBLER: *Vermivora peregrina* (Wilson)

RECOGNITION MARKS.—About the size of the Nashville Warbler; *no eye ring. Adult male in spring:* Head and nape neutral gray; *a narrow white line over the eye and a dusky line through the eye;* back and rump warbler green (yellowish green); underparts white. *Adult female in spring:* Head washed with greenish olive; underparts washed with greenish yellow. *Immature in autumn:* Entire upperparts and head warbler green; underparts greenish yellow.

RANGE.—Breeds from the Upper Yukon Valley, southern Mackenzie, northern Manitoba, and central Quebec south to southern British Columbia, southern Alberta, northern Minnesota, New York (Adirondacks), northern Maine, and New Hampshire (White Mountains). Winters from southern Mexico to Colombia and Venezuela.

DISTRIBUTION IN FLORIDA.—A rare spring and fall migrant. Recorded in spring on Sandy Key, April 13, 1917; Key West, April 24, 1914; at Punta Rassa, April 10, 1886 (specimen); Kramer Island, Lake Okeechobee, March 11, 1912 (Phelps, 1912, p. 125); Lake Charm, March 12, 1888 (specimen); Whitfield, April 15, 1903 (specimen); and Pensacola, March 21, 1886 (Evermann, 1886, p. 97).

In autumn, Weston reports a large migration on October 26 and 27, 1925, when 31 birds were killed at the lighthouse near Pensacola on the two nights, and large numbers seen on the morning of October 26 in vacant lots in the city. At Tallahassee, October 26 to 28, 1904, Williams noted about a dozen birds and collected several. Other fall records are Orlando, October 3, 1930; Lemon City, September 19, 1897 (specimen); Princeton, September 23, 1915; and Key West, October 5 and 6, 1887.

HAUNTS AND HABITS.—During migration the Tennessee Warbler frequents the taller trees and remains concealed much of the time. It is an active bird and sings very frequently a loud, unmusical, sputtering song that seems to stick in its throat. Seton says: "Its song begins with a note like *chipiti, chipiti* repeated a dozen or more times,

with increasing rapidity, then suddenly changed into a mere twitter" (Chapman, 1907, p. 85).

ORANGE-CROWNED WARBLER: *Vermivora celâta celâta* (Say)

RECOGNITION MARKS.—About the size of the Tennessee Warbler, but tail longer (length, 4.75 to 5.25 inches; spread, 7.25 to 8.00 inches; tail, 1.75 to 2.00 inches). *Winter plumage:* Upperparts warbler green (yellowish green), rather heavily washed with neutral gray (ochraceous-tawny crown patch rarely seen in this plumage); underparts pale lemon yellow, more or less obscured by a wash of pale neutral gray; throat often clear gray; wings and tail hair brown.

RANGE.—Breeds from northern Alaska southeast to northern Manitoba, and south locally in the Rocky Mountains to New Mexico. Winters in the Gulf and South Atlantic States from North Carolina south to southern Mexico. Rare in migration along the Atlantic slope from New Hampshire southward.

DISTRIBUTION IN FLORIDA.—A regular winter visitor in moderate numbers in all sections. Atkins (Scott, 1890a, p. 18) observed the earliest fall migrant at Key West, September 8, 1889, and found the birds common there, October 5, 1887. Weston reports the earliest seen at Pensacola on October 31, 1928. Chapman (1888a, p. 275) found them not rare at Gainesville in winter, the last being seen April 11, 1887. Specimens were taken at Pensacola, November 8, 1925; Whitfield, December 19, 1902, and February 9, and March 27, 1903; St. Marks, October 9, 1916; Amelia Island, January 1 to 18, 1918, and March 5, 1906; Cedar Keys, January 27, 1908; Eau Gallie, March 16, 1910; Jupiter, February 17 to 24, 1920; Chokoloskee, October 12, 1915; and Key West, March 5, 1890. The species was observed at Coconut Grove, January 15 and 16, 1925 (Chapman); Royal Palm Hammock, January 4, 1918 (Mrs. Byrd); and Tavernier, February 13, 1925 (Crosby); and there are numerous other winter records from the interior of the State.

HAUNTS AND HABITS.—Chapman says that he has found this species in Florida inhabiting the densely foliaged oaks. Wayne, in South Carolina, found the birds most numerous in thickets of lavender and myrtle, and in oak scrub. Their note is a sharp *chip*, which is distinctive.

NASHVILLE WARBLER: *Vermivora ruficapilla ruficapilla* (Wilson)

RECOGNITION MARKS.—About the size of the Blue-winged Warbler (length, 4.50 to 5.00 inches; spread, 7.30 to 7.75 inches). *Adult male in spring:* Head and nape neutral gray, *the crown sprinkled with chestnut;* eye ring white; back and rump yellowish citrine (olive); underparts lemon yellow; wings and tail hair brown (without white patches). *Adult male in autumn:* Chestnut on crown concealed by a grayish wash; yellow of underparts deeper (lemon chrome). *Adult female in spring:* Similar to adult male, but colors duller and with little chestnut on head.

RANGE.—Breeds from southern Saskatchewan, northern Ontario, and central Quebec south to Nebraska, northern Illinois, northern Pennsylvania, northern New Jersey, and Connecticut. Winters from Vera Cruz and Chiapas to Guatemala (casually in southern Texas and Florida).

DISTRIBUTION IN FLORIDA.—A very rare migrant in spring and fall, and a rare winter resident in the extreme southern part. Maynard (1881, p. 64) stated that the only record of its occurrence known to him was that of a specimen taken by Boardman at Jacksonville, March 13, 1869.[1] J. A. Allen (1871, p. 269) mentions its occurrence near Enterprise

[1] A specimen in the Museum of Comparative Zoölogy, taken by Maynard at Key West, November 17, 1870, seems to have been omitted from his published records.

about the middle of March. Single specimens were taken by Würdemann at Indian Key, March 23, 1857, and on the Tortugas, April 30, 1857. J. B. Ellis reported the species at Fakahatchee Island, April 29, May 1, and May 10, 1919. In fall migration and in winter it has been recorded at New Smyrna, November 11, 1923; Oxford, October 17, 1920; Princeton, September 22 and October 8, 1916; and January 14, February 1, and October 3 and 4, 1917; and Royal Palm Hammock, October 12 and 27, and December 24 to 28, 1917. Mrs. Byrd's records at Princeton were carefully made and checked by the identification of a specimen caught by a cat.

HAUNTS AND HABITS.—Gerald Thayer (Chapman, 1907, p. 95) thus describes this Warbler's habits:

> The Nashville's proper domain or "beat," during the breeding season, lies between the ground and the tops of the lower trees—mainly deciduous trees. He is a little, active, foliage-colored Warbler, unshowily yellow-breasted, inconspicuously gray-headed (except for a yellow throat, and a rufous crown-spot which scarcely shows at all) with a dim white eye-ring, but without tail-spots, wing-bars or any other bold markings. In demeanor it is one of the most nervously agile and restless of the gleaning Warblers.

SOUTHERN PARULA WARBLER: *Compsóthlypis americâna americâna* (Linnaeus)

OTHER NAME: **Blue Yellow-backed Warbler**

RECOGNITION MARKS.—Length, 4.00 to 4.25 inches; spread, 7.00 to 7.50 inches. *Adult male in spring:* Head, nape, and sides of neck grayish blue (parula blue of Ridgway); back and rump slightly paler blue; *middle of back yellowish green* (citrine); throat and breast lemon yellow, the throat with a more or less distinct band of fuscous or fuscous-black, the chest with an indistinct band of tawny; belly white; *two prominent white wing bars. Adult female in spring:* Similar to the male, but usually without dark markings on the throat and chest. *Immature in autumn:* Similar to the adult female (without dark breast markings), but upperparts more or less washed with light green. (Plate 53.)

RANGE.—Breeds from the District of Columbia south to southern Alabama and Florida. Winters in Florida and the West Indies.

DISTRIBUTION IN FLORIDA.—An abundant spring and fall migrant; a common summer resident south at least to Osceola County; and a rare winter resident, chiefly in the central and southern part. Owing to the presence of a few wintering individuals, it is difficult to determine when spring migration begins. The species was reported common at Miami, February 7, 1901 (Torrey, 1904, p. 107); at Old Town, February 13, 1893; and at Persimmon Hammock, St. Johns River, February 14, 1905. Those were probably wintering birds. Other winter records are: Key West, January 11, 1885; Newfound Harbor Key, January 19, 1919; Upper Matecumbe Key, February 5, 1910; Chokoloskee, January 25, 1915; Princeton, February 3, 1917; Eau Gallie, February 14, 18, and 26, 1910; Orlando, February 4, 1916; New Smyrna, February 13, 1922; and Sanibel Island, January 24, 1923. Chapman (1888a, p. 275) says the migrants began to arrive at Gainesville, February 22, 1887, and became abundant on February 25. Positive evidence of migration is furnished by the appearance of large numbers striking the light on Sombrero Key, March 3, 1889, when 250 birds were observed and 30 were killed. This species is one of the most numerous and regular visitants at the lighthouses on the east coast and on the Keys. On Sombrero Key, in 1885, 1886, 1887, 1888, and 1889, there are records of Parulas striking the light on many nights between March 3 and May 15, with one record on May

29 (1889). Doubtless many of these birds were of the northern race (*pusilla*), but the specimens were not identified beyond the species. The numbers seen in one night varied from 1 to 30, except in the case already mentioned (March 3). At Fowey Rocks Light, May 13, 1889, hundreds were reported, and at St. Augustine Light, April 26, 1884, 50 birds were counted. Early records on the mainland are from Micanopy, March 1, 1909; Palma Sola, March 6, 1912; Daytona Beach, February 21, 1925; De Land, February 27, 1911; Amelia Island, March 6, 1906; Whitfield, March 9, 1903; and Pensacola, March 4, 1922.

Although the Parula is known as a summer resident in many parts of the State, actual breeding records are few in number. Weston, at Pensacola, mentions finding young in the nest as early as May 1 (1918), and as late as June 29 (1919). Pennock noted young ready to fly at St. Marks, May 22, 1918. Longstreet records eggs found at Daytona Beach, June 13, 1908. Grimes (1931a, p. 85) mentions finding a nest in process of construction near Jacksonville, April 14, 1930. In the spring of 1925, I found the birds common at Old Town, June 11; Andalusia, June 13; Orange Park, June 17; Yulee, June 18; Boulogne, June 23; Silver Spring, June 4; Deer Park, May 3; and Illahaw, April 30.

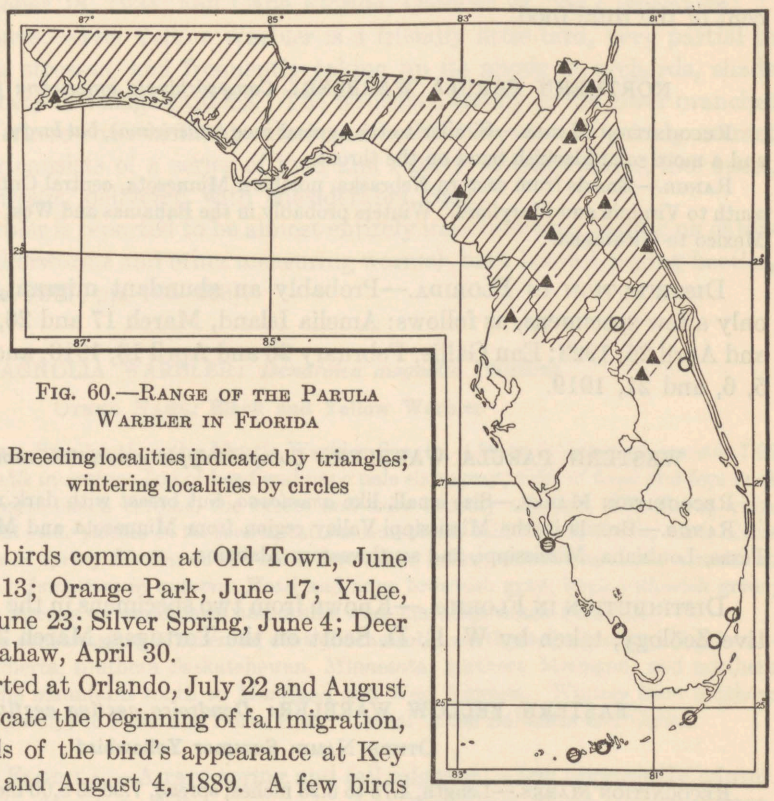

FIG. 60.—RANGE OF THE PARULA WARBLER IN FLORIDA

Breeding localities indicated by triangles; wintering localities by circles

Large flocks reported at Orlando, July 22 and August 4, 1910, probably indicate the beginning of fall migration, as do also the records of the bird's appearance at Key West, July 30, 1888, and August 4, 1889. A few birds were noted on the Tortugas, August 13 to 21, 1925. One bird struck the light at Ponce Park, October 15, 1912. The last seen in autumn were recorded at Pensacola, September 26, 1926, and at Tallahassee, October 20, 1904.

HAUNTS AND HABITS.—The dainty little Parula Warbler is found most frequently in cypress swamps or heavily timbered bottomlands, and to a lesser extent in the upland hammocks. The abundant Spanish moss on the trees furnishes ideal nesting sites for the birds, and this material is apparently used exclusively for the body of the nest, which is lined with a few fine grasses or with thistle down. Placed at a height of 8 to 100 feet or more above the ground, the nests are very difficult to locate without close observation

of the nesting birds. The birds dwell chiefly in the upper parts of the trees, and sing during the breeding season with great regularity. The commonest song is a simple, buzzing trill on an ascending scale, ending with an abrupt *zip*. Another song is described by Chapman as a "gurgling sizzle, *chip-er, chip-er, chip-er, chee-ee-ee-ee.*"

Food.—Examination of the stomachs of four birds taken in Florida in February showed the contents to consist almost wholly of insects and spiders, with a few bud scales. Hymenoptera (ants, bees, and wasps) composed the largest item, amounting in two instances to approximately half the total contents. Other insects taken in smaller quantities were lepidopterous larvae, fly larvae, beetles, weevils, scale insects, bugs, and grouse locusts. Spiders were found in three stomachs, and amounted to about 20 per cent of the total food.

NORTHERN PARULA WARBLER: *Compsóthlypis americâna pusílla* (Wilson)

Recognition Marks.—Similar to the typical race (*americana*), *but larger, with relatively smaller bill,* and a more solid blackish band on the throat.

Range.—Breeds from eastern Nebraska, northern Minnesota, central Ontario, and Anticosti Island south to Virginia and Maryland. Winters probably in the Bahamas and West Indies, and from southern Mexico to Nicaragua.

Distribution in Florida.—Probably an abundant migrant, though known from only a few specimens, as follows: Amelia Island, March 17 and 26, and October 1, 1906, and April 26, 1923; Eau Gallie, February 26 and April 13, 1910; and Gainesville, October 5, 6, and 21, 1919.

WESTERN PARULA WARBLER: *Compsóthlypis americâna ramalínae* Ridgway[1]

Recognition Marks.—Size small, like *americana,* but breast with dark markings, as in *pusilla.*

Range.—Breeds in the Mississippi Valley region from Minnesota and Michigan south to eastern Texas, Louisiana, Mississippi, and southwestern Alabama.

Distribution in Florida.—Known from two specimens in the Museum of Comparative Zoölogy, taken by W. E. D. Scott on the Tortugas, March 24, 1890.

EASTERN YELLOW WARBLER: *Dendroica aestíva aestíva* (Gmelin)

Other Name: **Summer Yellowbird**

Recognition Marks.—Length, 4.75 to 5.25 inches; spread, 7.00 to 8.00 inches. *Male:* Head orange-yellow, with faint reddish streaks; back pyrite yellow (yellowish green); underparts deep yellow (near primuline yellow), streaked with tawny; wings fuscous, with lemon yellow edgings; *tail mostly lemon yellow. Female:* Similar to the male, but underparts lemon yellow, faintly or not at all streaked.

Range.—Breeds from the tree limit in northern Mackenzie south to Nevada, northern New Mexico, southern Missouri, northern Alabama, and northern Georgia. Winters from Yucatan to Guiana, Brazil, and Peru.

Distribution in Florida.—A common fall migrant, less numerous in spring. First arrivals in spring were recorded at Everglade, March 11, 1930; Key West, April 16, 1909;

[1] For original description, see Bul. 50, U. S. Nat. Mus., part 2, p. 486, 1902.

Seven Oaks, April 11, 1902; Hastings, April 13, 1919; St. Marks, April 11, 1919; Whitfield, April 17, 1903; and Penascola, April 11, 1924. The last seen in spring were noted at Seven Oaks, May 27, 1901 (specimen); New Smyrna, May 10, 1924; Pensacola, May 21, 1919; and on the Tortugas, May 22, 1922.

The return journey from the North begins in midsummer, the first birds having been reported at St. Marks, July 18, 1918; Pensacola, July 21, 1923; Wakulla Beach, July 27, 1924; Fernandina, July 28, 1906; Fort De Soto, July 26, 1914; Orlando, July 29, 1909; and Key West, July 26, 1889. Single birds were observed on the Tortugas, August 22 to 24, 1925, and September 4 and 5, 1923. The latest dates of occurrence in fall are: Pensacola, October 9, 1926; St. Marks, October 8, 1918; Fernandina, October 5, 1906; Daytona Beach, October 18, 1924; and Cape Florida, October 27, 1857 (specimen).

HAUNTS AND HABITS.—The Yellow Warbler is a friendly little bird, very partial to willow thickets along streams, and frequently taking up its abode in orchards, shade trees, or in the shrubbery of village gardens. The birds feed chiefly in the lower branches of trees and bushes, where their brilliant colors and active movements quickly attract attention. The song consists of a series of loud and cheery whistled notes, like *sweet, sweet, sweet, sweet, sweetie,* delivered with considerable vigor.

FOOD.—This Warbler is reported to be almost entirely insectivorous, feeding on caterpillars (including cankerworms and other measuring worms), bark beetles, boring beetles, and weevils (Forbush, 1907, pp. 195–196).

MAGNOLIA WARBLER: *Dendroica magnolia* (Wilson)

OTHER NAME: **Black and Yellow Warbler**

RECOGNITION MARKS.—Smaller than the Myrtle Warbler (length, 4.50 to 5.10 inches; spread, 7.00 to 7.80 inches). *Adult male in spring:* Top of head and nape pale slate-gray; sides of head and fore back black; *rump* and underparts lemon chrome, the breast and sides broadly streaked with black; wings sooty drab, *with prominent white patches on the coverts;* tail fuscous-black, *with a broad band of white across the middle. Adult female in spring:* Similar to the male, but colors duller; sides of head and streaks on underparts less blackish. *Immature in autumn:* Head and nape brownish gray; back yellowish green; throat varied with buff; streaks on underparts and white wing markings much reduced.

RANGE.—Breeds from southwestern Mackenzie, central Manitoba, northern Quebec, and Newfoundland south to central Alberta, southern Saskatchewan, Minnesota, northern Michigan, and northern Massachusetts, and in the mountains south to Maryland and West Virginia. Winters from southern Mexico to Panama and (rarely) in Haiti and Porto Rico. Casual in the Bahamas and Cuba.

DISTRIBUTION IN FLORIDA.—A rare spring and fall migrant; a few apparently winter. First arrivals from the North in fall were reported at Pensacola, September 30, 1923; St. Marks, September 30, 1917; Tallahassee, October 8, 1911; Coronado, October 15, 1910; and Seven Oaks, October 11, 1901. The last seen in fall were recorded at Pensacola, October 25, 1922. Boardman is said to have taken a specimen in February at Green Cove Springs (Maynard, 1881, p. 57). Ingersoll reported two males seen at New Smyrna, January 28, 1913; John H. Baker identified a female bird at Palm Beach, March 3, 1930; and Pennock noted two birds at Punta Gorda, March 26, 1925. There are two records of occurrence in spring at Key West—May 17, 1887, and April 27, 1889. Bartsch observed a few on the Tortugas, May 13 to 22, 1922. Other spring records are: Seven

Oaks, April 25, 1901; Tallahassee, April 20, 1902; Chipley, April 5, 1903; and Pensacola, May 4, 1926, and May 13, 1923 and 1925.

HAUNTS AND HABITS.—In its migrations the Magnolia Warbler is likely to be found anywhere in deciduous woodland or shrubbery, perhaps favoring the low, damp thickets along streams. The birds are quick and nervous in their movements, frequently spreading the tail in such a way as to display the large white transverse patches on the outer tail feathers. According to Thayer (Chapman, 1907, p. 125):

> The Magnolia belongs among the full-voiced Warblers, and is a versatile singer, having at least two main songs, both subject to much and notable variation. The typical form of the commoner song is peculiar and easily remembered: *Weeto weeto weeétee-eet,* or *Witchi, witchi, witchi tit,*—the first four notes deliberate and even and comparatively low in tone, the last three hurried and higher pitched, with decided emphasis on the antepenult *weet* or *witch.*

CAPE MAY WARBLER: *Dendroica tigrina* (Gmelin)

RECOGNITION MARKS.—About the size of the Yellow Warbler (length, 4.75 to 5.25 inches; spread, 7.50 to 8.50 inches). *Adult male:* Upperparts warbler green (yellowish green), spotted with fuscous-black, darkest on the head; rump olive-yellow; *cheeks auburn;* underparts and sides of neck lemon yellow, *heavily streaked on breast and sides with fuscous-black;* wings fuscous *with a prominent white patch. Adult female:* Head and back deep olive-gray, shading to olive-yellow on the rump; *no cheek patches;* little white on wings; underparts pale buff or buffy white, streaked with deep mouse gray. Autumn specimens have the spotting of upperparts more or less obscured by buffy brown or olive-brown.

RANGE.—Breeds from southern Mackenzie, northern Ontario, New Brunswick, and Nova Scotia south to Manitoba, northern Maine, and New Hampshire, and in Jamaica. Winters in the Bahamas and the West Indies, and casually on the Florida Keys. Accidental in Yucatan and Central America.

DISTRIBUTION IN FLORIDA.—An abundant spring and fall migrant in peninsular Florida and on the Keys. Scott (1890a, p. 18) reports the birds not uncommon near Tarpon Springs from April 17 to May 4. I have examined 47 specimens from that locality, taken by Scott between April 22 and 26, 1890. Atkins found them common at Key West from April 11 to May 4, 1887, and from October 14 to November 1, 1887 (Scott, 1890a, p. 18). The first migrant in spring struck the light on Sombrero Key, March 3, 1887, and the earliest seen at Key West was recorded on March 6, 1890. The species was reported at Miami, March 23, 1871 (specimen); Princeton, March 26, 1915; Mullet Key, March 29, 1914; Seabreeze, April 3, 1901; Immokalee, April 9, 1919; Eau Gallie, April 13 to 29, 1910 (6 specimens); Old Town, April 15, 1892; Daytona Beach, April 26 to May 13, 1926; St. Marks, May 2, 1919; St. George Island, May 9, 1926; Orlando, May 10, 1914; Anastasia Island, May 16, 1894; and Warrington, May 18, 1918. Bennett (1909, p. 111) observed the birds in numbers on the Tortugas, April 20, 1909, following a violent storm on April 14. Scott took specimens there, April 8 and 27, 1890, and Bartsch noted single birds there, May 7, 1913, and May 17, 1919.

The first migrants in fall struck Sombrero Key Light on September 17, 1887, and others on September 18, October 7, 16 (30 birds), 17 (20 birds), and November 4. Migrants were reported at Coconut Grove, August 28 and 29, 1929; Daytona Beach, September 15, 1911; Fernandina, September 25, 1906; Tarpon Springs, September 25, 1906; Fort Pierce, October 3, 1918; Fort Lauderdale, October 19, 1924; Princeton, October 26, 1917; Lemon City, November 25, 1898; and Key West, October 14, 1887. Maynard (1881, p.

56) states that these Warblers were very abundant at Key West in November and that a few remained all winter. One was recorded at Hastings, December 6, 1918.

HAUNTS AND HABITS.—The Cape May Warbler is a rather unsuspicious bird, and during its migrations in fall it often visits gardens and dooryards, remaining for days at a time to search the shrubbery for insects or berries. Chapman (1907, p. 130) reports having found the birds actually common in weed patches among a rank growth of pokeberries. Butler, in Indiana, observed them usually on the drier uplands, among oaks, where they foraged in tall bushes and small trees. The song is described as "of a thin and penetrating tone, much like the Black and White Warbler's" (Thayer).

FOOD.—Nineteen stomachs of this species examined in the Biological Survey contained insect remains, chiefly moths, flies, ants, bees, bugs, beetles, and small crickets. Numerous observers have reported the birds puncturing ripening grapes, and considerable damage may at times result from their attacks. Six stomachs of birds taken at Eau Gallie, Florida, in April contained beetles, ants, wasps, flies, leaf hoppers, termites, larvae of moths, one dragon fly, one daddy-long-legs, and a few spiders.

BLACK-THROATED BLUE WARBLER: *Dendroica caerulescens caerulescens* (Gmelin)

RECOGNITION MARKS.—Smaller than the Myrtle Warbler (length, 4.80 to 5.10 inches; spread, 7.00 to 7.75 inches). *Adult male:* Upperparts green-blue slate, shading to blackish on forehead; throat, sides of head and of body black; underparts white; wings hair brown, *with a prominent white patch at base of primaries. Adult female:* Upperparts deep olive; underparts yellowish olive-buff; white spot in the wing often much reduced or obsolete.

RANGE.—Breeds from northern Minnesota, central Ontario, and Quebec south to central Minnesota, southern Michigan, southern Ontario, Pennsylvania (mountains), and northern Connecticut. Winters on the Florida Keys (rarely), in the Bahamas, Greater Antilles, and on Cozumel Island, and casually in Guatemala and Colombia. Casual in migration west of the Mississippi Valley.

DISTRIBUTION IN FLORIDA.—An abundant migrant on the Keys and on the peninsula, but very rare in northwestern Florida; a few winter on Key West, as reported by Maynard (1881, p. 54) and Atkins (Scott, 1890a, p. 18). The migrations of this warbler to and from the West Indies carry the birds across the Lower Keys, and thousands are observed in spring and fall at the lighthouses off the southern coast, especially on Sombrero Key, directly south of Cape Sable. The earliest records of migration on this key are on March 9 and 21, 1886, and the species was noted in small numbers there on many nights during April and May, up to May 29 (1889), when 6 birds were recorded. On the mainland, the earliest arrivals were reported at Princeton, April 5, 1917; Southport, Kissimmee River, April 3, 1901; Gainesville, April 5, 1888; Amelia Island, April 8, 1916; and Pensacola, April 24, 1928. On the Tortugas, specimens were taken March 24, 1890, and May 2, 1919, and others were recorded on May 3, 4, and 8, 1913. Bennett (1909, p. 111) mentions a large flight there, April 14 to 20, 1909. At St. Augustine Light, 17 birds were recorded as striking the light on May 14, 1884—the latest date on which they were noted in spring.

The earliest records of fall migrants are from Princeton, August 29, 1918, and from Coconut Grove, August 29, 1929. On Sombrero Key, the first migrant seen at the lighthouse was reported on September 3, 1885. Others were recorded on September 9 and on many other nights in September, October, and November, the last observed being 3

birds on December 5. The heaviest flights occurred in September and October. On October 9, 1885, 335 birds were reported striking the light, 91 of which were killed; on September 17 and 18, 1887, 360 birds struck, 101 of which were killed; and on October 16 and 17, 1887, 700 struck, 86 of which were killed. Mainland records in the fall are: Pensacola, September 24, 1926; Fernandina, September 22, 1906; De Land, September 14, 1911; Seven Oaks, September 20, 1904; Fort Pierce, September 21; November 1, 1918; New Smyrna, November 4, 1899; Princeton, September 16 and October 15, 1916; and Royal Palm Hammock, October 5 to 18, 1918. A single individual noted at Sanibel Island, January 22, 1923, was probably a wintering bird.

The absence of records from northwestern Florida is noticeable. Worthington and Todd did not report the bird during the spring migration at Whitfield; Pennock saw none at St. Marks during several years' residence; and Weston has seen the species but once at Pensacola.

HAUNTS AND HABITS.—In its northern home the Black-throated Blue Warbler inhabits heavy, moist, deciduous woodland, usually where there is a thick growth of underbrush. In its migrations it is likely to be found in thickets or open woodland, feeding chiefly among the lower branches. It is an unsuspicious bird, easily observed and recognized by the squarish white patch in the wing. The song also is characteristic—a drowsy, drawled melody of three or four buzzing notes with a rising inflection.

FOOD.—Examination of the stomach contents of 7 specimens taken at Eau Gallie in spring showed that a large percentage of the food was composed of parasitic Hymenoptera, chiefly of small size; and beetles, flies, ants, bugs, and the larvae of moths were taken in smaller quantities, with a few scale insects and spiders.

CAIRNS'S WARBLER: *Dendroica caerulescens cairnsi* Coues

RECOGNITION MARKS.—Similar to the Black-throated Blue Warbler, but adult male darker above, the back usually spotted or clouded with black; "female darker and duller olive above and less yellowish beneath" (Ridgway).

RANGE.—Breeds in the southern Alleghenies from Maryland to Georgia. Winters in the West Indies.

DISTRIBUTION IN FLORIDA.—Doubtless a common migrant, but known at present from only 3 specimens, as follows: Florida Keys, April 10, 1908 (collection of A. C. Bent); Eau Gallie, April 25, 1910 (collection of John E. Thayer); Amelia Island, April 24, 1923 (Biological Survey collection).

MYRTLE WARBLER: *Dendroica coronata coronata* (Linnaeus)

OTHER NAME: Yellow-rumped Warbler

RECOGNITION MARKS.—Length, 5.25 to 5.75 inches; spread, 8.50 to 9.40 inches. *Adult male in spring:* Upperparts bluish gray, streaked with black; a large black patch on sides of head; *patch on crown, one on rump, and one on each side of breast, wax yellow;* underparts white, the breast and sides broadly streaked with black; wings and tail with white patches. *Adult female in spring and male in winter:* Similar to the summer male, but duller in color, the upperparts shaded with brown; sides of head brown; crown patch concealed and yellow epaulets less prominent. (Plate 48.)

RANGE.—Breeds from the tree limit in northern Manitoba and northern Quebec south to northern Minnesota, northern Michigan, central Ontario, New Hampshire, and Maine, and in the mountains of

New York, Vermont, and Massachusetts. Winters from Kansas, the Ohio Valley, and New Jersey (locally southern New England) south to the Greater Antilles, Mexico, and Panama.

DISTRIBUTION IN FLORIDA.—An abundant migrant and winter resident in all parts. First arrivals in fall were recorded at Pensacola, October 18, 1929; Chipley, October 14, 1903; Tallahassee, October 16, 1904; Orlando, October 15, 1911; and on Sombrero Key, October 3, 1888. A specimen taken at Key West, July 28, 1888 (Scott, 1888, p. 430), may have been a bird that failed to go north in spring. Migrants continued to appear on Sombrero Key in small numbers during October and November, 1888, and until December 11, 1887.

The birds are reported abundant in winter on Matecumbe Key, occurring also on Indian Key, Key West, and, rarely, on the Tortugas (March 14 and 16, 1923, and May 18, 1922).

Spring migration starts late in February, as indicated by the appearance of hundreds of birds at Fowey Rocks Light on February 23, 1892. Sixty birds were reported at Sombrero Key Light, March 3, 1889, and smaller numbers on March 11 and 24, and April 3. Single individuals were noted on the Tortugas, May 3, 1913, and March 31, 1918. The species was recorded as common on Upper Matecumbe Key in winter, the last birds being seen on March 24 (1910). The last birds observed in spring were reported at Daytona Beach, April 27, 1926; St. Marks, April 20, 1919; Pensacola, April 30, 1923; and St. Joseph Point, April 30, 1926.

HAUNTS AND HABITS.—During their stay in the South, the Myrtle Warblers frequent a variety of situations, chiefly thickets, hedges, and the brushy borders of woodland. Not infrequently they may be found in numbers on the Gulf beaches, or in reeds in the salt marshes of the coast or in the Everglades. They are partial to the borders of streams or sloughs, and sometimes venture out on the floating vegetation in rivers or lakes. At Cape Sable, in February, I found them numerous in the wet mangrove sloughs, as well as in the dry hammocks. The birds are quite unsuspicious of man, and often feed in dooryards and about house porches. They are easily recognized by the conspicuous yellow rump patch, or by the characteristic *tchip*, which is frequently uttered as the birds flit leisurely from one perch to another.

FOOD.—A study of the food of the Myrtle Warbler in autumn (Weed and Dearborn, 1901, pp. 117–128) showed it to consist mainly of bayberries, caddis flies, beetles, plant lice, house flies and other Diptera, and various insect larvae. Berries of the wax myrtle and bayberry, with those of the red cedar, furnish in some localities a large part of the winter food, supplemented with such insects as are readily available. "The vegetable food of the myrtle warbler has no economic value and the bird eats various sorts of destructive insects, so that it is a fair conclusion to say that these modest little warblers are deserving of man's continual protection."

BLACK-THROATED GREEN WARBLER: *Dendroica virens virens* (Gmelin)

RECOGNITION MARKS.—Smaller than the Myrtle Warbler (length, 4.75 to 5.25 inches; spread, 7.50 to 8.00 inches). *Adult male in spring:* Upperparts warbler green (yellowish green), with a few faint blackish spots on the back; sides of head and neck lemon yellow; *throat, breast, and sides of body black,*

wings blackish brown, *with two prominent white bars. Adult female in spring:* Similar to the male, but chin and throat yellow, and black of breast obscured with whitish margins of the feathers. *Immature in autumn:* Upperparts more yellowish; underparts buffy white, with the dark streaks on sides obscured; sides of head and throat yellowish.

RANGE.—Breeds from northern Alberta, central Ontario, central Quebec, and Newfoundland south to southern Minnesota, southern Wisconsin, northern Ohio, northern New Jersey, and Long Island, and in the Alleghenies to northern Georgia and northern Alabama. Migrates west to eastern Texas. Winters from northern Mexico to Panama. Occasional in the West Indies and on the Florida Keys. (Another race, *D. v. waynei*, breeds in the coast region of South Carolina.)

DISTRIBUTION IN FLORIDA.—An uncommon migrant in spring and fall; casual in winter on the Keys. Scott (1890a, p. 20) records a specimen taken by Atkins at Key West, January 28, 1888; other specimens were taken there, April 1, 1888, and March 3, 1890, and one on the Tortugas, April 26, 1890. Chapman reports three birds seen at Royal Palm Hammock, March 13 and 14, 1925. Migrants were noted at Princeton, March 17, 1916; Milton, March 23, 1881; Pensacola, March 23, 1886; De Land, April 13, 1913; Palma Sola, May 10, 1909; and St. Marks, May 2, 1919.

First arrivals in autumn were recorded at Pensacola, September 9, 1923, and September 12, 1920; Palma Sola, September 11, 1912; Tarpon Springs, October 15, 1886; and Key West, October 14, 1887. The last were noted at Pensacola, November 2, 1919, and 1924; De Funiak Springs, October 29, 1909; St. Marks, October 26, 1913; and on Sombrero Key, November 10, 1888. Scott (1890c, p. 223) reports a few near Cape Sable, in February.

HAUNTS AND HABITS.—In its summer home the Black-throated Green Warbler is partial to coniferous woods—pines, junipers, hemlocks, or spruces—but in some sections, as on the mountain slopes in Alabama, it lives in deciduous or mixed forests. In migration it is likely to occur in any sort of timber. "Active, restless, but very tame, it is a noticeable little bird wherever it occurs, particularly in the clearly-marked costume of the adult male, whose almost fleckless yellow cheeks often lead chance observers to describe it as *yellow-headed*" (Gerald Thayer, in Chapman, 1907b, p. 159). The song is characteristic—a drowsy, drawled ditty of four or five notes, *wee-wee-wee-su-see*, the next to the last note on a lower pitch and the final one distinctly higher.

FOOD.—Barrows (1912, p. 618), writing of this warbler, says:

> This species is mainly insectivorous, and, owing to its abundance and the considerable period over which its visits extend during migration, it is one of the most valuable warblers in holding orchard insects in check. Both spring and fall it may be found gorging itself with plant lice and searching the twigs and leaves for span-worms, leaf-rollers and harmful insects of every kind. It also eats berries and possibly a few seeds, being particularly fond of the berries of the poison-ivy, and to a less extent of those of the junipers.

CERULEAN WARBLER: *Dendroica cerúlea* (Wilson)

RECOGNITION MARKS.—About the size of the Parula Warbler (length, 4.25 to 5.00 inches; spread, 7.25 to 8.00 inches). *Adult male:* Upperparts green-blue slate, shading on head to orient blue or alice blue, and on rump to pale green-blue gray, the back more or less heavily streaked with black; underparts white, *with a narrow bluish black band across chest*, and sides streaked with the same; two white wing bars; tail fuscous-black, with prominent white patches. *Adult female:* Crown deep glaucous-green; back dull yellowish green; underparts buffy white, tinged on breast and throat with pale yellow.

RANGE.—Breeds from southeastern Nebraska, southeastern Minnesota, southern Michigan, southern Ontario, and central New York south to northeastern Texas, Louisiana, central Alabama, and northern Georgia. Winters from Panama to Peru. Casual in Cuba and the Bahamas.

DISTRIBUTION IN FLORIDA.—A rare spring and fall migrant. Specimens were taken on the Tortugas, March 23, 1890, and at Key West, April 16, 1887, and April 29 and July 15, 1889 (Scott, 1890a, p. 19; e, p. 313). Worthington collected one on Amelia Island, August 10, 1906, and R. D. Hoyt reported one taken at Seven Oaks (date not recorded). E. S. Hyer records several seen at Orlando, May 2 and 16, 1909.

HAUNTS AND HABITS.—On its breeding grounds the Cerulean Warbler selects heavy deciduous timber in river bottoms or on moist mountain slopes, living chiefly in the upper branches of the trees. The song resembles one of the songs of the Parula Warbler rather closely. Lynds Jones (Chapman, 1907b, p. 173) describes it as follows:

> It consists of two distinct parts, the first of several definite single syllables with a comma pause between each two, followed by a trilled syllable of about double the length of the first part. . . . The syllables *tse, tse, tse, te-e-e-e-e-e-e-e-e* serve to recall it to mind. The song rolls up the scale quietly and evenly.

BLACKBURNIAN WARBLER: *Dendroica fusca* (Müller)

RECOGNITION MARKS.—Smaller than the Myrtle Warbler (length, 4.75 to 5.50 inches; spread, 7.60 to 8.50 inches). *Adult male in spring:* Upperparts chiefly black, varied with yellowish white streaks on the back and scapulars; spot on crown and large patch on side of neck light cadmium (orange-yellow); *throat and breast orange;* belly buffy white, washed with pale lemon yellow; sides streaked with black; *a large white patch* on secondaries. *Adult female in spring:* Upperparts grayish olive, streaked with fuscous-black; throat yellowish orange (much paler than in the male); sides of head mouse gray. *Immature in autumn:* Upperparts buffy brown, streaked with blackish; underparts wax yellow, shading to pale buff on the belly; faintly streaked on sides with blackish.

RANGE.—Breeds from central Manitoba, central Ontario, and Quebec south to central Minnesota, Wisconsin, northern Michigan, and Connecticut, and in the Alleghenies from Pennsylvania to northern Georgia. Winters from Yucatan and Guatemala south to Colombia and Peru. Casual in migration in the Bahamas.

DISTRIBUTION IN FLORIDA.—A rare spring and fall migrant; probably a few winter in extreme southern Florida. Scott (1890a, p. 20) records specimens taken at Key West, October 21, 1887, and July 29, 1889, and at Tarpon Springs, September 1, October 1, and October 15, 1886. Weston took single specimens at Pensacola, October 26, 1925 (struck lighthouse), and September 26, 1926. Williams collected one at Tallahassee, October 26, 1904, and Pennock two at St. Marks, October 9 and 17, 1919. The species was reported at Palma Sola, September 9, 1912, and at Arcadia, October 30, 1919. Scott (1890c, p. 223) observed it near Cape Sable in February, 1890, and Dr. H. C. Burgess noted it at Royal Palm Hammock, December 26 to 28, 1917. A specimen was taken on the Tortugas in 1864. Spring records are few in number: Miami, April 22, 1911; Seven Oaks, April 29, 1901, and April 10 and 13, 1902; Palma Sola, April 24 to 28, 1911; and Pensacola, May 8 and 9, 1924, and April 12, 1925.

HAUNTS AND HABITS.—In its summer home the Blackburnian is a typical forest warbler, inhabiting the upper branches of the taller trees, preferably hemlocks or white pines. In migration it is found in deciduous woodland, often near the ground. It is a restless, quick-moving bird, but not shy.

YELLOW-THROATED WARBLER: *Dendroica dominica dominica* (Linnaeus)

RECOGNITION MARKS.—About the size of the Myrtle Warbler, but with longer, more curved bill (length, 4.75 to 5.50 inches; spread, 8.00 to 8.75 inches; bill, .50 to .60 inch.) *Adult male:* Forehead and sides of head black; a white line over the eye, *becoming yellow on lores;* upperparts neutral gray; throat and breast wax yellow; belly white, the sides streaked with black; wings fuscous, with two prominent white bars. *Adult female:* Very similar to the male, but with less black on crown. (Plate 49.)

RANGE.—Breeds from southern Maryland and central Delaware south to middle Florida. Winters in the Bahamas and Greater Antilles, and in small numbers in Florida and on the coast of South Carolina. (Another race, *D. d. albilora*, occurs in the Mississippi Valley).

DISTRIBUTION IN FLORIDA.—A common summer resident in northern and central Florida, breeding as far south at least as Osceola County (Lake Gentry) and Punta Rassa. In winter it is reported from New Smyrna (common, December and January); St. Marks (January 14, 1914); Lake Iamonia (one, December 28, 1921); East Goose Creek, Wakulla County (few, December 29 to January 2); Tallahassee (one, January 3, 1901); Orlando (December 11 to 31, 1913); Fort Myers (December 24 to January 31); Fort Pierce (December and January); Princeton (January 1, 1917); and Royal Palm Hammock (January 7, 1917).

The beginning of spring migration is indicated by the appearance of the birds at Sombrero Key Light on March 11, 1888, and March 3, 1889. I collected two specimens at Ritta, February 27 and 28, 1918, probably migrants. Chapman (1888a, p. 276) noted the arrival of migrants at Gainesville on March 2, 1887, and first arrivals were reported at Amelia Island, March 3, 1906; Whitfield, February 26, 1903; and Pensacola, March 1, 1918. Scott (1890e, p. 313) took specimens on the Tortugas, March 23 and 29, and April 8, 1890, and others were collected there, March 10 and 14, 1923. Bowdish recorded migrants on Pigeon Key, April 27, on Sands Key, April 28, and on Peterson Key, April 30, 1911.

Fall migration begins early, as indicated by the appearance of the birds at Key West about July 25 (Scott, 1890a, p. 20), and at the lighthouses off the coast in August. They were present in numbers on the Tortugas, August 1 to 23, 1925. Many birds struck the light on Sand Key, August 13, 1902, and that on Fowey Rocks, August 31, 1902. The earliest record of birds striking the light on Sombrero Key is September 13, 1887, and small numbers were reported striking it on many nights from that date until September 25, and on October 13, 16, and 17. At Alligator Reef, large numbers struck the light on October 9 and 10, 1885. At Fowey Rocks one bird was taken on November 7, 1891. The latest one noted in autumn at Pensacola was seen on November 4, 1918.

HAUNTS AND HABITS.—The Yellow-throated Warbler is found in the more open forests of pine or mixed timber, particularly about the borders of swamps. It dwells chiefly in the upper parts of the trees, moving about rather deliberately, and frequently uttering its loud and attractive song, which easily calls attention to the bird. This song bears a resemblance to that of both the Louisiana Water-Thrush and the Indigo Bird.

D. J. Nicholson discovered three nests at Pennichaw, April 1, 1927, in process of building in hanging moss, 30 to 40 feet up on horizontal limbs of cypress trees. Cory (1880, p. 66) records a nest containing 4 fresh eggs at Jacksonville, April 28, in a clump of Spanish moss suspended from the end of a large branch about 20 feet from the ground.

According to Wayne (1910, p. 166), nests in South Carolina are almost invariably built in festoons of Spanish moss, and the nesting season extends from the first of April onward, two broods being raised.

Food.—Stomachs of 7 specimens of this bird from Florida, examined in the Biological Survey, contained beetles, moths and their larvae, flies, bugs, grasshoppers, grouse locusts, crickets, scale insects, and spiders.

CHESTNUT-SIDED WARBLER: *Dendroica pensylvánica* (Linnaeus)

Recognition Marks.—Smaller than the Myrtle Warbler (length, 4.60 to 5.25 inches; spread, 7.50 to 8.25 inches). *Adult male in spring:* Crown lemon chrome; back and rump yellowish green, heavily streaked on neck and fore back with black; underparts and sides of head and neck white; a black line over the eye and another on throat from base of bill; *a broad stripe of chestnut on sides of body;* wings fuscous, *with large yellowish white patches. Adult female:* Similar to the male, but colors duller; crown yellowish citrine (light olive); chestnut on sides much reduced. *Immature in autumn:* Entire upperparts warbler green (yellowish green); underparts white, sometimes with faint traces of chestnut on the sides.

Range.—Breeds from central Saskatchewan, central Manitoba, central Ontario, and Newfoundland south to eastern Nebraska, Illinois, Indiana, Ohio, northern New Jersey, and Long Island and in the Alleghenies to Tennessee and South Carolina. Winters from Guatemala to Panama. Casual in the Bahamas.

Distribution in Florida.—A rare spring and fall migrant. G. Clyde Fisher reported three birds seen at De Funiak Springs, April 3, 1909; Wayne took a specimen at Old Town, April 10, 1892; and Williams collected one at Tallahassee, September 23, 1904, and noted them common until October 13. Weston saw two birds at Pensacola, April 24, 1928; and several others, May 2, 1928. One bird struck the light at Ponce Park, October 15, 1912.

Haunts and Habits.—The Chestnut-sided Warbler dwells during the nesting season in bushy pastures and second-growth woodland, living chiefly in thickets and the smaller trees. It is one of the least wary of the warblers. Its song is a full-voiced, whistled utterance, strongly resembling the song of the Yellow Warbler, but subject to much variation.

BAY-BREASTED WARBLER: *Dendroica castánea* (Wilson)

Recognition Marks.—About the size of the Myrtle Warbler (length, 5.00 to 5.75 inches; spread, 8.25 to 9.25 inches). *Adult male in spring:* Forehead black; *crown chestnut;* sides of head blackish, varied with buff; a large patch of light buff on sides of neck; *chin, throat, and sides russet;* middle of breast and belly buffy white; back and rump light olive-gray, streaked with black; two white wing bars. *Adult female:* Crown russet, more or less varied with grayish olive; back less heavily streaked; russet on underparts paler and less extensive; throat mainly pale buff. *Immature in autumn:* Entire upperparts pale warbler green, or yellowish citrine (light olive); *underparts (including under tail coverts) light buff,* tinged with greenish yellow on breast. The young male shows more or less russet on the sides.

Range.—Breeds from northeastern Alberta, central Manitoba, central Quebec, and Newfoundland south to southern Manitoba and northern Maine, and in the mountains of New Hampshire. Winters in Panama and Colombia.

Distribution in Florida.—A rare spring and fall migrant. First arrivals in spring were reported at Princeton, March 17, 1916; Sanibel Island, April 27, 1910; Palma Sola, May 1, 1908; Hastings, April 27, 1919; Warrington, April 27, 1908; and Pensacola, April 30, 1924. The last were seen at Pensacola, May 11, 1917, and May 9, 1924. In fall

migration, the first birds were noted at Pensacola, September 24, 1922, and October 1, 1929; Tallahassee, October 13, 1904; St. Marks, October 25, 1919; and Fernandina, October 10, 1906. At the lighthouse near Pensacola, 29 birds were killed on October 26 and 27, 1925. The latest date of occurrence in Florida is November 2, 1919, at Pensacola.

HAUNTS AND HABITS.—The Bay-breast is a rather large warbler, leisurely in its movements, and most often found in migration in upland, deciduous timber. Its song is described as thin-voiced and sibilant, quite similar to the song of the Black-poll.

BLACK-POLL WARBLER: *Dendroica striata* (J. R. Forster)

RECOGNITION MARKS.—About the size of the Bay-breasted Warbler. *Adult male in spring: Crown black;* back and rump pale olive-gray or neutral gray, streaked with black; underparts white, streaked on sides of neck and body with black; wings fuscous, with two white bars. *Adult female in spring:* Upperparts warbler green (yellowish green), shading to neutral gray on rump, narrowly streaked with fuscous-black; underparts white, tinged with pale yellow, and moderately streaked with blackish on breast and sides. *Immature in autumn:* Similar to the immature female Bay-breast, but underparts brighter yellow (less buffy), and *under tail coverts pure white.*

RANGE.—Breeds from the limit of trees in northwestern Alaska, northern Mackenzie, northern Quebec, and Newfoundland south to central British Columbia, Manitoba, Michigan, New Hampshire, and Maine. Winters from Guiana and Venezuela to Brazil. Migrates through the Bahamas and West Indies.

DISTRIBUTION IN FLORIDA.—An abundant spring and fall migrant, except in northwestern Florida. The earliest recorded dates of appearance at the lighthouses off the southern coast are April 14, 1909, on the Tortugas, and April 14, 1885, on Sombrero Key. The birds appeared in small numbers at the latter station on many nights late in April, and in May until May 20 (1887). On May 19, 1887, 60 birds struck the light, 30 of which were killed, and on May 8, 1888, 50 struck the light, 6 of which were killed. On the mainland, the earliest migrants were reported at Miami, April 17, 1871; Palma Sola, April 15, 1911; Banana River, April 16, 1914; Gainesville, April 23, 1887; Old Town, April 24, 1893; Amelia Island, April 23, 1906; and St. Marks, April 14, 1914. The last observed in spring were recorded on the Tortugas, May 21, 1922; at Lake Worth, May 22, 1889; Anclote Key, May 22, 1918 (2 specimens); Palma Sola, May 24, 1913 (straggler, June 17, 1910); Mosquito Inlet, May 25, 1925; and Daytona Beach, May 27, 1922.

The beginning of fall migration is indicated by the appearance of 4 birds at Sombrero Key Light, September 25, 1888, and by a single specimen taken on Amelia Island, September 26, 1906. Migrants were noted at Sombrero Key on many nights in October, and on November 4, 10, and 16. On October 14, 1887, 160 birds struck that light, 95 of which were killed, and on October 16, 1887, 100 struck the light, 17 of which were killed. Fall records from the mainland are few in number. R. W. Williams (1906, p. 157) reports two specimens taken at Tallahassee, October 11 and 28, 1904; and Pennock mentions one seen at St. Marks, October 26, 1913. Other records are from Palma Sola, October 6, 1908; Fort Pierce, November 1, 1918; and Pensacola, October 26, 1925 (specimen killed at lighthouse). Apparently the species avoids or flies over western Florida in its migrations, as it has not been observed by Weston during a residence of 12 years at Pensacola, nor was it recorded by Worthington and Todd in the spring migration of 1903 at Whitfield.

HAUNTS AND HABITS.—The Black-poll, one of the larger wood warblers, is very leisurely in its movements. It is most likely to be found in deciduous woodland, in shade trees on town streets, or in orchards or gardens. The birds are not at all shy and are easily identified in spring, either by their markings or by their faint, lisping song—*tsit-tsit-tsit-tsit-tsit-tsit*, rendered with a rising and falling inflection. In the fall, however, when they have assumed their winter plumage, they are difficult to distinguish from the Bay-breast.

FOOD.—Of this species, Barrows (1912, p. 612), says:

> The food consists mainly of insects and the bird eats immense numbers of span-worms and plant-lice at all times of year. In the fall they also eat some seeds and berries, but they are mainly insectivorous and are expert fly catchers, taking much of their food on the wing. Forbes found that two-thirds of the food of those taken in an orchard overrun with cankerworms consisted of those worms, while 19 per cent consisted of beetles, 4 per cent of ants, and 5 per cent of gnats.

NORTHERN PINE WARBLER: *Dendroica pinus pinus* (Wilson)

RECOGNITION MARKS.—About the size of the Myrtle Warbler (length, 5.00 to 5.75 inches; spread, 8.50 to 9.50 inches). *Adult male in spring:* Upperparts yellowish citrine (olive), or warbler green; underparts wax yellow, faintly streaked with dull fuscous; wings and tail fuscous, the wings with dull white bars, and two outer tail feathers with large white, subterminal patches. *Adult female in spring:* Colors much duller than in the male, the upperparts often heavily clouded with fuscous; underparts variable, the abdomen smoke gray, and breast sometimes only faintly washed with yellow. *Immature in autumn:* Upperparts light brownish olive; underparts varying from pale wax yellow to buffy white. (Plate 49.)

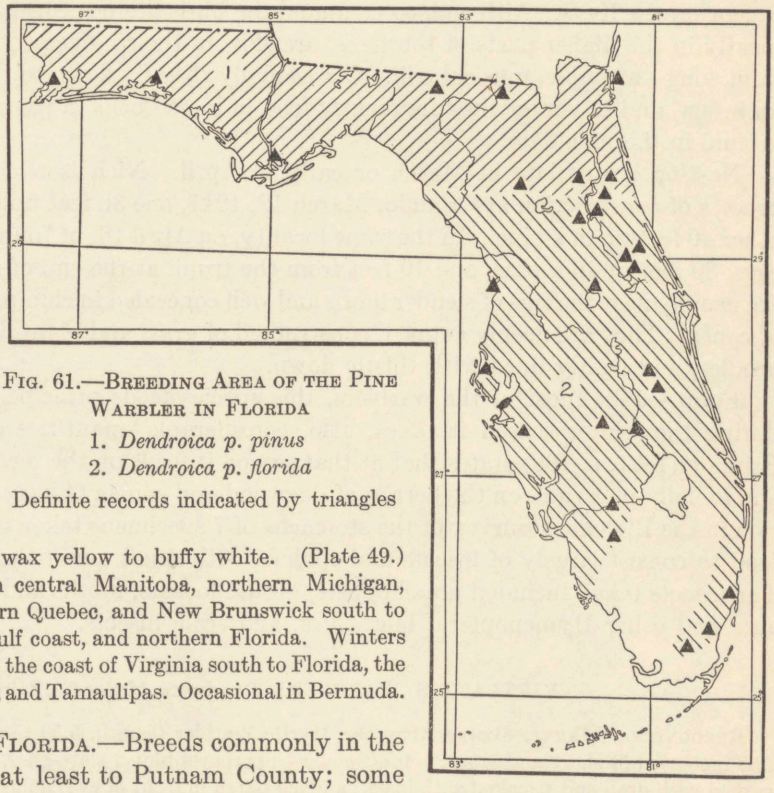

FIG. 61.—BREEDING AREA OF THE PINE WARBLER IN FLORIDA

1. *Dendroica p. pinus*
2. *Dendroica p. florida*

Definite records indicated by triangles

RANGE.—Breeds from central Manitoba, northern Michigan, southern Ontario, southern Quebec, and New Brunswick south to east central Texas, the Gulf coast, and northern Florida. Winters from southern Illinois and the coast of Virginia south to Florida, the Gulf States, eastern Texas, and Tamaulipas. Occasional in Bermuda.

DISTRIBUTION IN FLORIDA.—Breeds commonly in the northern part, south at least to Putnam County; some individuals apparently move southward in winter to central Florida. Specimens of the typical race taken in the breeding season have been examined from Mulat, Apalachicola

River, Whitfield, Cherry Lake (Madison County), Benton, Amelia Island, and San Mateo (June). Wintering specimens have been examined from Hibernia (February), Palatka (January), Tallahassee (February), Callaway, Clearwater (March 25), Goose Creek (Wakulla County), St. Marks, and Fort Bassenger (February 24). Grimes (1931a, p. 85) records finding several nests with eggs, near Jacksonville, during the first week in April.

HAUNTS AND HABITS.—See under the Florida Pine Warbler.

FLORIDA PINE WARBLER: *Dendroica pinus flórida* (Maynard)

RECOGNITION MARKS.—Very similar to the typical race (*pinus*), but *bill longer* and upperparts slightly more yellowish.[1] (Plate 49.)

RANGE.—Resident in central and southern Florida, from about latitude 29° (Volusia, Lake, and Citrus Counties) southward on the mainland as far as pine timber extends. Specimens of this race have been examined from Long Pine Key (southern Everglades), Homestead, Royal Palm Hammock, Immokalee, Miami River, La Belle, Alva, Istokpoga Lake, Kenansville, Illahaw, Braden River, Seven Oaks, Davista, Homosassa, Sebring (8 miles east), Zellwood, Orange City, Deep Creek, Enterprise, Samsula, and Welaka. (Fig. 61.)

HAUNTS AND HABITS.—The Pine Warbler is one of the most evenly distributed of Florida birds, being found nearly everywhere in the extensive pine forests of the State, except on the Keys. Although so common, the birds are not conspicuous, as they range mostly in the higher parts of the trees, are slow in their movements, and have a rather faint song—a simple, musical trill. Occasionally they fly down to the ground to pick up an insect, and in winter they frequently feed in loose flocks in pastures, fields, or on the ground in the pine flats.

Nesting begins late in March or early in April. Nicholson observed two nests in process of construction at Orlando, March 12, 1911, one 30 feet up in a cypress tree, the other 40 feet up in a pine. In the same locality, on April 18, he found a nest containing 4 eggs, 30 feet up in a pine, and 10 feet from the trunk at the end of a branch. The nests are usually near the tips of slender limbs and well concealed in clumps of leaves or bunches of cones. They are deeply cupped, constructed of grass and plant down, with a few pine needles, and neatly lined with thistle down.

FOOD.—Like most of the warblers, this species feeds principally upon insects, but during the winter season it takes, also, considerable quantities of vegetable matter. Brimley (1891, p. 199) states that at that season it feeds on the seeds of the short-leaved and loblolly pines and on the berries of dogwood and sumac (*Rhus copallina*). Examination in the Biological Survey of the stomachs of 7 specimens taken in Florida showed the food to consist largely of insects and spiders, with small quantities of vegetable debris. The insects taken included grasshoppers, grouse locusts, moths and their larvae, beetles, ants and other Hymenoptera, bugs, flies, and scale insects.

KIRTLAND'S WARBLER: *Dendroica kirtlandi* (Baird)

RECOGNITION MARKS.—Larger than the Myrtle Warbler (length, 5.50 to 6.00 inches; tail, 2.10 to 2.55 inches); bill short and stout. *Adult male:* Upperparts bluish slate-gray, the middle of the back washed with drab and streaked with black; a black patch in front of eye; underparts dull yellow (citron

[1] Cf. Howell, Auk, 1930, p. 42.

yellow), the sides streaked with black; wings fuscous, *without bars*. *Adult female:* Upperparts bluish mouse gray, the back streaked with fuscous; underparts pale yellow, *the breast finely spotted with fuscous*.

RANGE.—Breeds, so far as known, only in a restricted area on the jack pine plains of northern Michigan. Winters in the Bahamas. In migration, recorded from Minnesota, Wisconsin, Ontario, Ohio, Illinois, Indiana, Missouri, Virginia, South Carolina, Georgia, and Florida.

DISTRIBUTION IN FLORIDA.—A very rare migrant in spring and fall. Cory (1898, p. 331) records two individuals, one of which was collected, at West Jupiter, April 19 and 27, 1897. Schroder (1923, p. 122) reports one seen at Fort Pierce, November 1, 1918, and Ellis (1915, p. 209) mentions one, without comment, at Chokoloskee, October 11, 1915. Mrs. Byrd reports one seen at Princeton, October 25, 1915.

HAUNTS AND HABITS.—This, the rarest of the North American warblers, is one of the larger members of its genus. In its summer home, it inhabits high, sandy plains grown up to Banksian or jack pine, and is unevenly distributed in more or less isolated colonies. It nests on the ground and sings from a low perch. The bird is described as a graceful walker, with a pronounced habit of bobbing its tail. Maynard (1895, p. 594) found the birds wintering in the Bahamas, inhabiting old fields grown up to low scrub.

NORTHERN PRAIRIE WARBLER: *Dendroica discolor discolor* (Vieillot)

RECOGNITION MARKS.—Smaller than the Maryland Yellowthroat (length, 4.25 to 5.00 inches; spread, 6.50 to 7.25 inches). *Adult male:* Upperparts warbler green (yellowish green), *with a group of bay spots in the middle of the back;* underparts lemon chrome, the sides of neck and body with broad black streaks; wing coverts pale yellow or yellowish white; tail with extensive white patches on all but the middle feathers. *Adult female:* Similar to the male, but colors duller and reddish spots on back indistinct or obsolete. (Plate 44.)

RANGE.—Breeds locally from southeastern Nebraska, eastern Kansas, central Michigan, southern Ontario, and southern New Hampshire south to southwestern Missouri, southern Alabama, and central Georgia. Winters mainly in the Bahamas and West Indies.

DISTRIBUTION IN FLORIDA.—A common migrant in spring and fall, except in northwestern Florida, where it is rare. This race is not definitely known to breed in the State. Specimens have been examined from Nassau County, May 5, 1916; Eau Gallie, April 4, 1910; and Sand Key, near Miami, May 6, 1919.

Migrants[1] were recorded in small numbers on Sombrero Key, March 7, 10, and 11, 1888, and in moderate numbers on many nights from March 24 to May 12 (different years). On the Tortugas, Scott reported the species "not uncommon" in the spring of 1890, taking specimens March 24 and 28, and April 1 to 9. Bennett (1909, p. 112) noted a few birds there on April 20, 1909, and Bartsch observed some on April 28, 1914. Atkins found the species abundant at Key West in migration (Scott, 1890a, p. 21). Earliest dates of arrival in northern Florida are: Coronado, March 20, 1912; Lake George, March 29, 1886 (specimen); Gainesville, March 31, 1887; lower Suwannee River, March 21, 1890; Amelia Island, March 27, 1916; Whitfield, March 25, 1903; and Pensacola, March 20, 1919.

Fall migration begins early. Four birds were recorded at Pensacola, July 27, 1919, and six on July 28, 1929; also one at Tallahassee, August 6, 1900. Oue bird struck the light on Sombrero Key, August 1, 1888; many struck Sand Key Light, August 13, 1902;

[1] Some of the records listed here may refer to the Florida race (*collinsi*).

one was taken at Alligator Reef Light, August 22, 1889; and many struck the light at Fowey Rocks, August 23, 1889. Small numbers were noted at Sombrero Key Light during September, and larger numbers in October, and until November 4. On October 3, 1888, 47 birds struck the light, 9 of which were killed. Several were reported at Fowey Rocks Light, November 6 and 7, 1891. Bartsch observed a few on the Tortugas, September 4 to 6, 1923, and found them common there, August 13 to 19, 1925.

HAUNTS AND HABITS.—The Northern Prairie Warbler inhabits bush-grown pastures and second-growth sprout lands, placing its nests in bushes at a height of 3 or 4 feet.

FLORIDA PRAIRIE WARBLER: *Dendroica discolor cŏllinsi* Bailey[1]

RECOGNITION MARKS.—Similar to the northern race (*discolor*), but upperparts (especially in females) more grayish (less greenish), and with reddish markings on back less pronounced and sometimes lacking. (Plate 44.)

RANGE.—Breeds in peninsular Florida, chiefly along the coasts. Specimens taken in the breeding season have been examined from Anclote Key, Pass-a-Grille, Indian Rocks, Seven Oaks, Naples, Caxambas, Cape Sable, Biscayne Bay (9 miles east of Florida City), Canaveral, Turtle Mound, New Smyrna, Fernandina, and Key West. The species has been recorded also in the breeding season at Micanopy and Zephyrhills, but no specimens have been collected at those localities. Wintering specimens were taken at Key West, January 11, 1885, and on the peninsula opposite Micco, February 22, 1889. The species has been reported in winter, also, from the following localities, and probably most of the records refer to this race: New Smyrna, January 30, 1922; Hastings, December 10 and January 19; Lake Harney, December 28, 1913; Gainesville, December 23, 1919; Orlando, December 11; Micco, February 22, 1889; Lukens, December 29, 1905; Miami, February 7, 1901; Royal Palm Hammock, December 26 to 28, 1917; and Sanibel Island, January 22 to 27, 1923.

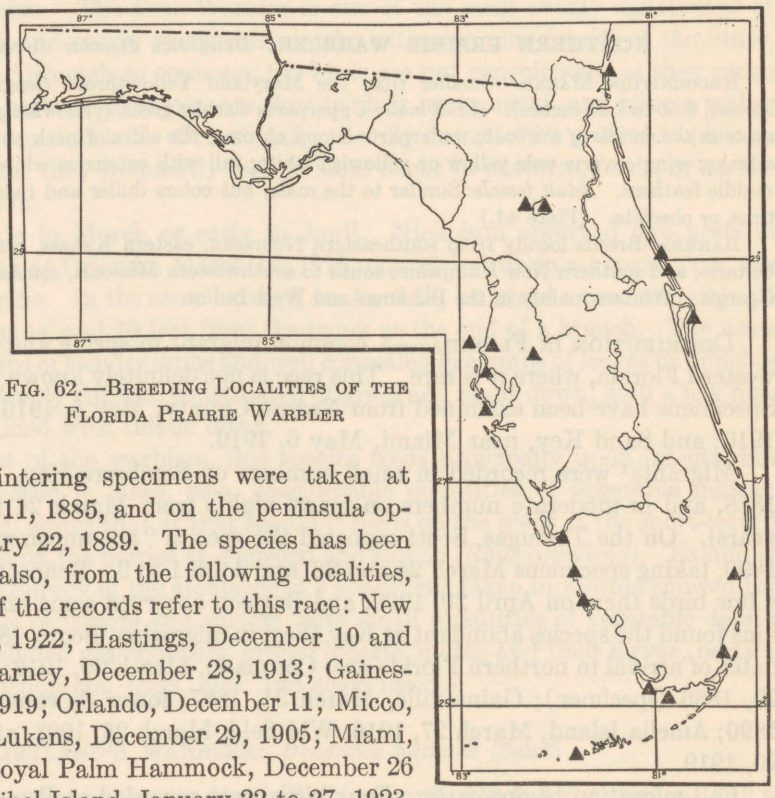

FIG. 62.—BREEDING LOCALITIES OF THE FLORIDA PRAIRIE WARBLER

[1] Described by H. H. Bailey in Bul. 3, Bailey Mus. of Nat. Hist. (Miami, Fla.), dated November 16 1926; the present writer, not having seen this paper, described the same race in The Auk, January, 1930, p. 41, under the name *Dendroica discolor paludicola*.

HAUNTS AND HABITS.—The Florida Prairie Warbler lives in a habitat very different from that chosen by its northern relative (*discolor*), being almost wholly restricted to tracts of mangroves bordering the coastal sloughs or marshes. At New Smyrna, R. J. Longstreet found several nests in small mangrove bushes growing on the borders of a marsh. One observed on May 3, 1925, partly finished, contained one egg on May 16, but later was deserted. This nest was composed of grayish colored plant fibers, shreds of bark, and pieces of twine, and was lined with very fine shreds of palmetto fiber of a brownish color, and a few feathers. E. J. Court collected a set of 3 eggs on Palm Key, near Cape Sable, March 29, 1925. Nevin J. Nicholson reports a nest in process of construction in the top of a 20-foot mangrove tree at Fort Lauderdale, June 6, 1925. D. J. Nicholson noted a nest at Elfers, June 16, 1929, 11 feet up in a mangrove, and a newly made nest at the same place, May 10, 1931.

On Anclote Key, May 21, 1918, we heard a dozen or more of these Warblers singing, and collected several specimens in breeding condition. The birds are rather shy during the nesting season; the males sing from near the tops of small mangrove trees and manage to keep well hidden in the foliage. The song sounds to my ears essentially like that of the northern birds—a series of drawled, shrilling notes on an ascending chromatic scale, uttered rather rapidly with the bill pointing nearly straight upward.

FOOD.—Examination of the stomachs of 10 specimens taken in Florida showed the food of this species to consist largely of moths and their larvae, beetles, bugs, flies, and spiders. Grasshoppers, tree-hoppers, ants and other Hymenoptera, and scale insects were eaten in smaller quantities, and one bird had picked up a fragment of a small bivalve.

WESTERN PALM WARBLER: *Dendroica palmârum palmârum* (Gmelin)

OTHER NAME: **Red-poll Warbler**

RECOGNITION MARKS.—Slightly smaller than the Pine Warbler (length, 4.75 to 5.50 inches; spread 7.50 to 8.40 inches). *Spring plumage:* Crown bay; a yellow line over the eye; back dark olive-buff, streaked with fuscous; rump greenish yellow; throat and breast lemon yellow, the breast finely streaked with cinnamon-brown; *belly light buff faintly washed with lemon yellow;* wings and tail fuscous, the latter with white patches at the tip. *Autumn plumage:* Upperparts light olive-brown, faintly streaked with blackish; underparts pale buff or buffy white, faintly washed with yellow. In all plumages this Warbler is recognized by its habit of wagging its tail up and down. (Plate 48.)

RANGE.—Breeds from southern Mackenzie and northern Manitoba south to northern Minnesota. Winters in Florida, the Bahamas, Greater Antilles, and Yucatan. Occurs in migration on the Atlantic slope. Accidental in California, Montana, and Colorado.

DISTRIBUTION IN FLORIDA.—An abundant migrant and winter resident over the entire State, including the Keys. First arrivals in fall were reported at Pensacola, September 22, 1929; St. Marks, September 15, 1919; Quincy, September 30, 1900; Daytona Beach, September 25, 1926; Sanford, October 1, 1887; Palma Sola, September 14, 1910; Tarpon Springs, September 22; Fort Pierce, October 5, 1918; Princeton, September 23, 1915; and Royal Palm Hammock, October 20, 1917. The first birds appeared at Sombrero Key Light on September 22, 1885, and September 21, 1886, and others were recorded on many nights in September, October, and November, up to November 19. On October 13, 1885, about 100 birds struck the light, and on November 4, 1888, 69 birds struck it, 20 being killed on each occasion.

I found the birds common near the coast in Wakulla County in January, 1920, and at Miami, Homestead, Royal Palm Hammock, and Cape Sable in January, 1918. Bayard Christy and George M. Sutton reported them abundant in the Everglades along the Tamiami Trail, February 20, 1927. Maynard (1881, p. 53) recorded them abundant in winter at Key West, and Loring found them common on Key Largo in March, 1895.

The beginning of spring migration was indicated by the appearance of a large flight on Sombrero Key, March 3 (1889), when 200 birds were counted, 25 of which were killed; smaller numbers struck the light on many nights in March and April, the last on May 15 (1888). Scott (1890c, p. 314) found the birds abundant on the Tortugas, March 22 to April 26, 1890; and Bartsch noted several there, May 13 and 14, 1922. On the mainland the last migrants were recorded at Princeton, April 24, 1916; Palma Sola, April 30, 1911; Gainesville, April 29, 1887; and St. Marks, May 2, 1919.

Haunts and Habits.—The Palm Warbler is a prominent feature of winter bird life in Florida, and in many places it is the most abundant species, often occurring in loose flocks numbering 50 or more. The birds are found in a variety of situations—hammocks, prairies, marshes, pine flats, old fields, cultivated lands, town yards, and even the Gulf beaches. They are largely terrestrial, but flit about in shrubbery or small trees near the ground, flirting their tails up and down in a characteristic manner. In winter the birds are almost voiceless, except for a soft, weak *tsip*.

Food.—The food of this Warbler consists mainly of insects. Examination of the stomachs of 15 birds taken in Alabama showed the contents to be weevils and other beetles, ants and other Hymenoptera, small bugs, caterpillars, and ephemerids. R. W. Williams, at Tallahassee, in October, 1904, observed large numbers of Palm Warblers feeding on cotton worms. F. M. Uhler, in studying the bird's food habits in the celery fields around Sanford, found the destructive celery leaf-tyer in nearly all the 23 stomachs examined, amounting to 73 per cent of the total contents. Other items found in the stomachs were flies, 12.7 per cent; Lepidoptera (mainly cutworms), 6 per cent; and Hymenoptera, 7 per cent.

YELLOW PALM WARBLER: *Dendroica palmárum hypochrýsea* Ridgway

Other Name: Yellow Red-poll Warbler

Recognition Marks.—Similar to the Western Palm Warbler, but *underparts wholly deep yellow* (between wax yellow and lemon yellow).

Range.—Breeds from Hudson Bay, northern Quebec, and Labrador south to Nova Scotia, New Brunswick, and eastern Maine. Winters from Louisiana to Florida, and casually north to North Carolina. Accidental in Bermuda and the West Indies.

Distribution in Florida.—A winter resident in moderate numbers, chiefly in northwestern Florida, but recorded also from the southern part and the Keys. Much less numerous than the Western Palm Warbler (*palmarum*). Specimens of this race have been examined from Tallahassee, January 21, 1903; Goose Creek, Wakulla County, January 10, 1920; Palatka, March 8, 1881; Hibernia, February, 1870; Welaka, October 21, 1884; Gainesville, March 7, 1887; Tarpon Springs, January 3, 8, 16, 17, and 30, 1890; Seven Oaks, April 8, 1901; Cape Sable, March 29, 1926; and the Tortugas, April 12, 24, and 26, 1890. Subspecific identification in the field is not always to be depended on, but the

following records are believed to be reliable. Maynard (1895, p. 608) states that he has observed both forms of this species at Key West. Bartsch reports the Yellow Palm at that locality, April 24, 1914; on Indian Key, Knight's Key, and Tea-Table Key, April 22, 1914; and on the Tortugas, May 2 to 6, 1913, April 25 to 28, 1914, and May 17, 1919. Chapman (1907b, p. 217) mentions seeing 15 individuals during the winter at Gainesville with the flocks of the more numerous *palmarum*. Worthington records the arrival of the first migrants of this race at Amelia Island, September 19, 1906, taking specimens on September 22. At the same locality he found the birds abundant on November 1, 1905. Mrs. Byrd noted the Yellow Palm at Princeton and Royal Palm Hammock in November and December, 1917, and H. H. Schroder reported birds seen at Fort Pierce nearly every day from October 5, 1918, to March 2, 1919.

OVEN-BIRD: *Seiûrus aurocapillus* (Linnaeus)

OTHER NAMES: **Golden-crowned Thrush; Nightwalker**

RECOGNITION MARKS.—About the size of the Song Sparrow, but tail shorter (length, 5.50 to 6.50 inches; spread, 8.75 to 10.00 inches); *a ground walker;* looks like a thrush, but much smaller than any of our species. *Adult: Middle of crown and nape ochraceous-tawny, bordered on each side with a fuscous stripe;* upperparts dark citrine (yellowish olive); underparts white, the breast and sides spotted or streaked with clove brown (dark olive brown).

RANGE.—Breeds from southwestern Mackenzie, central Ontario, central Quebec, and Newfoundland south to central Alberta, Colorado, Kansas, southern Missouri, northern Alabama, and northern Georgia. Winters from northern Florida (casually South Carolina) and the coast of Louisiana through the Bahamas and West Indies, and from northern Mexico to Colombia.

DISTRIBUTION IN FLORIDA.—An abundant migrant and common winter resident in central and southern Florida; rare in winter in the northern part. Earliest arrivals from the North in fall were recorded at Pensacola, August 10, 1924; Tallahassee, August 17, 1904; Cape Canaveral, August 23, 1888; Key West, August 19, 1889; Princeton, August 28, 1918; the Tortugas, August 16, 1922; Fowey Rocks Light, August 31, 1902; and Sombrero Key Light, September 7, 1888. An observer at St. Augustine Light noted large numbers there during the nights just prior to September 11, 1902. The species was observed at Sombrero Key Light in varying numbers during many nights in September and October and on November 4 and 11 (1888). On October 7, 1886, 57 birds were reported there, 14 of which were killed, and on November 16, 1887, 80 birds struck the light, 15 of which were killed.

Single wintering birds were recorded at Pensacola, February 12, 1926; Whitfield, January 21, 1903; St. Marks, January 16, 1915; February 2, 1917; Hawkinsville, January 3, 1905; Gainesville, December 16 and 29, 1919; Gulf Hammock, January 3, 1907; Zephyrhills, December 25, 1922; and Tarpon Springs, December 30, 1889. Wayne (1893, p. 337) mentions the birds as abundant at Old Town, February 13, 1893, probably having wintered there, and Scott (1890a, p. 21) reports them fairly common in winter at Punta Rassa and Key West. I found them numerous in the Royal Palm Hammock in January, 1918.

Because of the presence of wintering birds, it is difficult to determine the date when spring migration begins. The earliest migrants were recorded on the Tortugas, March 21

and 24 (1890), and on Sombrero Key, April 6 (1887). Single birds were noted at Tallahassee, March 2, 1902, at Pensacola, March 26, 1886, and on Amelia Island, March 11 and 27, 1916, some of which may have wintered. Small numbers were seen on Sombrero Key on many nights in April and May, up to May 29 (1889); on May 8, 1888, 19 birds were observed there. A large flight struck the light on the Tortugas, April 14, 1909, and hundreds of the birds were present there on April 20 (Bennett, 1909, p. 111). The species is usually uncommon at Pensacola, but on April 30, 1924, Weston found it abundant for a few hours in a vacant lot in town. At Daytona Beach, it was reported on April 30 and May 19, 1926.

HAUNTS AND HABITS.—The Oven-bird is a dweller in heavy, deciduous woodland, usually in dry situations. The birds are largely terrestrial, walking with dainty, graceful steps and a jaunty air on the ground or on fallen logs or branches of trees, ascending to a low perch in the trees only to deliver their song. This is given at frequent intervals, the birds often not changing their position for quite a period. It is a simple ditty of six or eight double notes—*p'chée, p'chée, p'chée, p'chée, p'chée, p'chée*—strongly accented on the second syllable and growing louder with each note. Never particularly shy, during their winter sojourn the birds often become so tame as to come to a doorstep (if the house is in the forest) to pick up crumbs, and once one almost walked over my shoes as I sat quietly.

FOOD.—The food of the Oven-bird consists almost wholly of insects, including beetles, crickets, grasshoppers, ants, caterpillars, moths, and flies. Barrows (1912, p. 629) says the bird "consumes immense numbers of insects, spiders, myriapods and small snails and slugs, together with a few seeds and berries." It has been reported to feed on the fruit of the red mulberry.

NORTHERN WATER-THRUSH: *Seiúrus noveboracénsis noveboracénsis* (Gmelin)

OTHER NAMES: **Small-billed Water-Thrush; Wagtail**

RECOGNITION MARKS.—About the size of the Oven-bird (length, 5.25 to 6.25 inches; spread, 8.50 to 9.50 inches; bill, .43 to .55 inch). *Adult:* Upperparts olive-brown; a buffy white stripe over the eye; underparts *pale yellow*, streaked and spotted with fuscous; wings and tail fuscous, without markings. Usually found on the ground near water, tilting body and tail up and down constantly. (Plate 51.)

RANGE.—Breeds from northern Ontario, northern Quebec, and Newfoundland south to central Ontario, northwestern New York, and northern New England, and in the mountains to Pennsylvania and West Virginia. Winters from the Valley of Mexico to Colombia and British Guiana, and in the Bahamas, West Indies, and Florida.

DISTRIBUTION IN FLORIDA.—An abundant migrant and a rare winter resident. First arrivals from the North in autumn were recorded at Pensacola, September 9, 1918, and August 25, 1929; Tallahassee, September 13, 1904; St. Marks, September 14, 1915; Fernandina, September 6, 1906; Coronado, August 29, 1909; St. Lucie, September 23, 1888; Princeton, September 19, 1916; Key West, August 16, 1889; the Tortugas, August 13, 1925; and Alligator Reef, September 20, 1889 (specimen). Some of these records may refer to the subspecies *notabilis*, but in the absence of specimens their identity can not be determined. The few winter records are given here, although none of them are based on

specimens. Scott (1881, p. 15) says that the Water-Thrush was not uncommon at Clearwater in February, 1880. I observed two birds in a mangrove swamp at Coot Bay, near Cape Sable, February 11, 1918; and Wetmore reported one at Fort Lauderdale, February 19, and one at Royal Palm Hammock, February 21, 1919. Maynard noted the species at Key West late in December, and M. S. Crosby saw single birds on Boca Chica Key, March 1, and at Newfound Harbor, March 2 (1925).

There are numerous records of these birds striking the lighthouses off the southern coast, but, as pointed out by Professor Cooke (1904a, p. 104), there is considerable doubt as to the correctness of the identifications as between this species and *Seiurus motacilla;* hence the records can not be used. It seems probable, however, that the records of 25 birds striking Sombrero Key Light on May 8, 1888, and 4 on May 19, 1887, refer to this species. Maynard reported the first birds at Miami on March 15, 1871, and found them common on Indian River, April 20. Earliest migrants were recorded at Cape Sable, March 29, 1926; Princeton, April 6, 1917; Eau Gallie, April 12, 1910 (common, April 23); Daytona, April 8, 1917; and the Tortugas, April 25, 1890. The bulk of the spring migration passes late in April and early in May. The birds were said to be common on Amelia Island, May 4, 1916. Some were seen on the Tortugas, May 5, 1913, and May 14 to 22, 1922; on Sands Key, May 8, 1913; Fakahatchee River, May 10, 1919; Deer Park, May 3 and 4, 1925; and Daytona Beach, May 14, 1924.

Haunts and Habits.—The Northern Water-Thrush during its migrations frequents wet sloughs and swamps, feeding on the ground in thickets and among the mangrove roots. Resembling the thrushes in general coloration, these birds may be recognized by their habit of tilting the body as they walk, and by the sharp *chink* of alarm they utter when startled. Occasionally they sing in migration—"a ringing, bubbling warble, swift and emphatic" (Thayer).

GRINNELL'S WATER-THRUSH: *Seiúrus noveboracénsis notábilis* Ridgway

Recognition Marks.—Slightly larger than the eastern race (*noveboracensis*); upperparts more sooty (near clove brown); underparts usually more whitish (less yellowish); indistinguishable from the eastern race in the field.

Range.—Breeds from the limit of trees in northwestern Alaska, northwestern Mackenzie, and northern Manitoba south to southern British Columbia, central Montana, northwestern Nebraska, northern Minnesota, and northwestern Michigan. Winters in Cuba and the Bahamas, and from Mexico to northern South America. Migrates throughout the Mississippi Valley, and along the Atlantic coast from South Carolina southward.

Distribution in Florida.—An abundant migrant, most numerous in the autumn. Atkins (Scott, 1890a, p. 21) records it as one of the most abundant migrants at Punta Rassa and Key West, the first birds arriving at the latter place about August 16, 1889. Specimens have been examined from Cape Sable, April 2, 1926; Tarpon Springs, April 23 to 28, August 15 and September 22, 1890; Punta Rassa, February 7, August 7, September 23 and October 9, 1886; Key West, March 5, 6, and 11, 1890; Amelia Island, April 23 and 27, 1923; St. Joseph Point, April 30, 1926; and Pensacola, September 2, 1919. Scott took two on the Tortugas, March 26 and 28, 1890, and Brewster and Chapman recorded the bird's arrival on the lower Suwannee River, March 21, 1890.

LOUISIANA WATER-THRUSH: *Seiúrus motacílla* (Vieillot)

OTHER NAME: Large-billed Water-Thrush

RECOGNITION MARKS.—About the size of the Northern Water-Thrush, and very similar in appearance, but *bill larger;* upperparts clove brown; *a clear white line over the eye; underparts white,* the breast and sides streaked with hair brown (dark drab); *throat unspotted.* (Plate 51.)

RANGE.—Breeds from southeastern Nebraska, southeastern Minnesota, and the southern parts of Michigan, Ontario, New York, and New England south to northeastern Texas, southern Alabama, northern Georgia, and central South Carolina. Winters from northern Mexico to Colombia, and in the Greater Antilles, Antigua, and the Bahamas.

DISTRIBUTION IN FLORIDA.—Uncommon migrant in spring and fall; casual in winter. Worthington took one specimen at Eau Gallie, January 24, and observed others there February 21, and March 14 and 19 (1910). Specimens have been examined also from the Miami River, March 19, 1902; Bassenger, March 22 and April 3, 1907; Old Town, March 16, 1893; Winter Park, March 28, 1914; and La Belle, April 16, 1907. Single birds struck the light at Canaveral, April 15, 1902, and at Mosquito Inlet, May 8, 1901. First arrivals were reported at Key West, April 6, 1889; Seabreeze, April 3, 1901; Amelia Island, April 8, 1916; and Pensacola, March 16, 1924. The record from Pensacola constitutes the only one from the region in eight years' observation by Weston.

The fall migration begins very early. First arrivals were recorded at Tallahassee, July 23, 1904; Old Town, July 23, 1892 (specimen); and Key West, July 16, 1888. Migrants were noted at Sombrero Key Light on August 21 and 29, and September 10, 14, 15, and 21, 1884, and at Fowey Rocks, October 31, 1888, and November 2, 1890. Ellis (1915, p. 209) reports the capture of a specimen at Chokoloskee, October 12, 1915.

HAUNTS AND HABITS.—The Louisiana Water-Thrush dwells in moist ravines in heavy, deciduous forest, and to a less extent in river-bottom swamps. In migration the birds may be found in any moist situation in timber. They resemble the Northern Water-Thrush very closely in habits, but are more shy. They have the same characteristic habit of tilting the body up and down, as if they had springs in their legs. Their alarm note is similar to that of their northern relative, but their song is distinctive—a loud, rich, ringing warble, beginning with three slurred notes, followed by a rather confused jumble of twittering notes. The opening notes are much like those of Swainson's Warbler.

FOOD.—Examination of the stomachs of 4 birds of this species from Florida showed their food to consist chiefly of insects and spiders. The insects included dragon flies, crane-fly larvae, grouse locusts, beetles, bugs, ants, caterpillars, and scale insects. Two of the birds had eaten small mollusks, and one had taken a killifish.

KENTUCKY WARBLER: *Oporórnis formósus* (Wilson)

RECOGNITION MARKS.—Larger than the Maryland Yellowthroat (length, 5.00 to 5.75 inches; spread, 8.10 to 9.25 inches); crown black, edged with gray; *eye ring and line to bill yellow;* a broad black stripe beneath the eye; upperparts olive-citrine (dark olive); underparts clear strontian yellow (dark citron yellow).

RANGE.—Breeds from southeastern Nebraska, southern Wisconsin, southern Pennsylvania, and the Hudson Valley south to eastern Texas, Louisiana, southern Alabama, and northern Georgia. Winters from southern Mexico to Colombia. Accidental in Cuba.

DISTRIBUTION IN FLORIDA.—A rare spring and fall migrant; probably breeds in extreme northwestern Florida. Migrants were recorded on the Tortugas, March 29, 1890, and April 28, 1914; Sombrero Key, April 25, 1887; at Tarpon Springs, April 6, 1886; St. Marks, April 4, 1917; Leon County, April 4, 1926; Whitfield, April 20 and May 5, 1903; and Pensacola, April 1, 1923, and April 11, 1924. Weston reports seeing singing males on July 12, 1925, and June 27, 1926, near Pensacola; these he believed to be breeding. South-bound migrants were noted at Pensacola, August 24, 1924, and September 7, 1918; Tallahassee, September 4, 11, and 18, 1904; Chokoloskee, October 25, 1915 (specimen); and Princeton, October 25, 1915.

HAUNTS AND HABITS.—During the nesting season Kentucky Warblers are found in moist, heavily-wooded ravines among the hills and in swampy river-bottom woods. The birds spend most of their time on the ground, walking about in search of food, often singing from the ground or a low perch. The song is a rich, melodious warble, resembling certain songs of the Carolina Wren. The nest is a bulky structure of dead leaves, grasses, grapevine bark, and similar material, placed on the ground in the woods, usually at the base of a small bush or in a clump of plants.

FOOD.—Little is known of the food habits of this Warbler. The stomachs of two birds taken in Alabama contained the remains of bugs, beetles, caterpillars, and ants and other Hymenoptera.

CONNECTICUT WARBLER: *Oporornis agilis* (Wilson)

RECOGNITION MARKS.—Slightly larger than the Kentucky Warbler (length, 5.25 to 6.00 inches) *Adult male:* Crown deep neutral gray; *a complete white eye ring;* upperparts and tail brownish olive; throat and breast neutral gray; belly wax yellow. *Adult female:* Upperparts olive-citrine (dark olive); throat pale buff; breast smoke gray; belly dull citron yellow.

RANGE.—Breeds from Manitoba to central Minnesota and northern Michigan. Winters in South America, probably in Colombia and Brazil. Migrates through Florida and the Bahamas.

DISTRIBUTION IN FLORIDA.—A rare migrant in spring and fall. Migrants were reported striking the light on Sombrero Key, May 4, 8, and 12, 1888, and May 19, 1887 (6 birds), and the Mosquito Inlet Light, May 9, 1902 (6 birds), and May 25, 1925. On the mainland, specimens were taken at Old Town, May 10 and 11, 1893; Anclote Key, May 24, 1887; and Daytona Beach, May 18, 1927. At the last-mentioned locality birds were seen on May 12, 21, 22, 23, 25, and 26, 1928 (Berger, 1928, p. 90). In the fall migration, Pennock recorded single birds seen at St. Marks, September 21, 1916, and September 22, 1919. Four birds struck the light on Sombrero Key, October 9, 1885.

HAUNTS AND HABITS.—During its migrations the Connecticut Warbler is usually found on or near the ground in wet situations among rank vegetation. Here the birds are inconspicuous and difficult to dislodge, although sometimes "squeaking" will cause them to fly to a low perch from which they can inspect the intruder. Brewster (1906, p. 351), writing of the birds in Massachusetts, says:

> When flushed they would usually fly up into the low bushes and sit there motionless in thrush-like attitudes, gazing at us intently with their large dark eyes. If further disturbed, they were nearly sure to take long flights to distant parts of the swamp. During cloudy weather we sometimes found them feeding with Blackpoll Warblers in the tops of large willows, fifty or sixty feet above the ground.

MOURNING WARBLER: *Oporórnis philadélphia* (Wilson)

RECOGNITION MARKS.—About the size of the Kentucky Warbler (length, 5.00 to 5.75 inches; spread, 7.60 to 8.15 inches). *Adult male:* Top and sides of head slate-gray (*no white eye ring*); throat and breast pale slate-gray, overlaid with black (darkest on chest); belly strontian yellow (dark citron yellow); back dark citrine (olive); tail olive. *Adult female:* Head deep mouse gray; throat and breast pale smoke gray; otherwise like male.

RANGE.—Breeds from east central Alberta, southern Saskatchewan, central Manitoba, Nova Scotia, and Magdalen Islands south to central Minnesota, Michigan, and central Ontario, and in the mountains of New York, Pennsylvania, Massachusetts, and West Virginia. Winters from Nicaragua and Costa Rica to Colombia and Ecuador.

DISTRIBUTION IN FLORIDA.—A very rare migrant. Known from three records, as follows: St. Augustine (13 miles west), March 13, 1883, specimen in the Academy of Natural Sciences of Philadelphia, taken by M. H. Wood; Chokoloskee, September 30, 1915, specimen taken by J. B. Ellis (1915, p. 209); and Sands Key, May 8, 1913, one seen by Paul Bartsch (1914a, p. 103).

HAUNTS AND HABITS.—Gerald Thayer (Chapman, 1907b, p. 247) says of this bird:

> Its call-notes I have never heard, wittingly, and its full-voiced, highly-modulated singing I have heard too seldom to warrant my attempting a detailed description of it. In migration, it is a somewhat shy and quick-moving Warbler, like a Yellow-throat with a dash of Water-Thrush blood. It hops about in thickets like a Yellow-throat, but is prone to visit also the overgrowth of deciduous woods and hedgerows. The first one I ever saw I shot from the top of a seventy-foot maple, whither it had flown from a blossoming apple tree. The Mourning has also manners in common with its close cousin the Connecticut, notably the habit of stopping very short and sitting quite still for a few seconds.

MARYLAND YELLOW-THROAT: *Geóthlypis trichas trichas* (Linnaeus)

RECOGNITION MARKS.—Length, 4.30 to 5.00 inches; spread, 6.50 to 7.00 inches. *Adult male: Forehead and sides of head black, bordered by a band of pale smoke gray;* rest of upperparts olive-citrine; throat and breast lemon chrome; belly pale buff; tail brownish olive. *Adult female:* Top of head nearly same color as the back (no black markings); throat and breast pale wax yellow.

RANGE.—Breeds from central Pennsylvania, Kentucky, and Arkansas south to northern Georgia, northern Alabama, southern Mississippi, and southeastern Texas. Winters in the Carolinas, Georgia, Florida, the Bahamas, Cuba, and Mexico.

DISTRIBUTION IN FLORIDA.—Probably a common migrant in spring and fall, but few specimens have thus far been collected. Specimens have been examined from Amelia Island, February 24, 1906, and April 26, 1923; Eau Gallie, January 20, April 25, and May 5, 1910; Nassau County, May 6, 1916; northern Brevard County, March 10, 1905; Key West, April 27, 1888; and Florida Keys, December 5, 1870.

The large number of records of birds striking the lighthouses off the coast may be summarized here, although doubtless many of them refer to the Northern Yellow-throat (*brachidactyla*) and some to the Florida Yellow-throat (*ignota*). The earliest date of appearance at Sombrero Key Light is March 3, 1889, when a large flight, estimated at 150 birds, was recorded, and 18 birds were killed. Smaller numbers were reported there on March 6, 10, and 11, 1888, and on March 25, 1887, 70 birds were counted. Migrations of this species occurred on many nights during April and May during the years in

which records were kept (1884–1889) at Sombrero Key, the latest dates being May 20, 1888, and May 29, 1889. On May 5, 1885, 140 birds were counted, 30 of which were killed, and on May 8, 1888, 175 were counted, 37 of which were killed. On the Tortugas the species was recorded on March 21, and April 7 and 26, 1890, April 14 to 20, 1909, and May 3 to 7, 1913; on Marquesas Key, May 7, 1913; Sands Key, May 8, 1913; and Key West, April 24, 1914. Specimens were taken at Mosquito Inlet Light, May 8 and 9, 1902, and at St. Augustine Light, May 7, 1902.

In the fall migration, the first birds were reported on Sombrero Key on September 12, 1885, and September 14, 1884. The birds passed in considerable numbers on many nights late in September, October, and November, up to November 20 (1887), when the last flight was recorded. The heaviest flights occurred on September 25, 1888 (57 birds); October 2, 1888 (107); October 13, 1885 (450); October 17, 1887 (80); and November 4, 1888 (163). On October 10, 1890, 28 birds struck the St. Johns River Light.

HAUNTS AND HABITS.—See under the Florida Yellow-throat (p. 418).

NORTHERN YELLOW-THROAT: *Geóthlypis trichas brachidáctyla* (Swainson)

RECOGNITION MARKS.—Similar to the Maryland Yellow-throat, but averaging larger; adult male with underparts more extensively yellow, and upperparts darker.

RANGE.—Breeds from southern Manitoba, southern Quebec, and Newfoundland south to northern Oklahoma, southern Illinois, Ohio, northern New Jersey, and Long Island, and west to eastern North Dakota and eastern Kansas. Winters from Texas, Louisiana, and North Carolina to Florida, the Bahamas, West Indies, and through Mexico to Panama.

DISTRIBUTION IN FLORIDA.—Occurs as a migrant in spring and fall. Known from the following records of specimens examined: Punta Rassa, August 21, 1886; Miami, January, 1871; Gainesville, February 13, 1890; Orange Hammock, Kissimmee River, March 16, 1895; and New Smyrna, May 3, October 24, and November 4, 1899, and April 26, 1900. Two birds that struck the Fowey Rocks Lighthouse, October 23, 1903, were sent to the Biological Survey and identified as this subspecies.

HAUNTS AND HABITS.—See under the Florida Yellow-throat.

FOOD.—Concerning the Northern Yellow-throat, Forbush (1907, p. 187) writes:

> The yellow-throat, on account of its destruction of leaf hoppers and grasshoppers, may be ranked among the useful birds of the fields. In orchards it often feeds very largely on cankerworms, going long distances from its nest to get these caterpillars to feed to its young. . . . Case bearers, leaf rollers, and many other destructive caterpillars are greedily devoured and it also catches and eats both butterflies and moths in considerable numbers. Along the borders of woods it is very destructive to many beetles, flies, and especially to plant lice, of some species of which it is very fond. It often goes to grain fields, where, so Wilson says, it eats insects that infest them.

FLORIDA YELLOW-THROAT: *Geóthlypis trichas ignóta* Chapman

RECOGNITION MARKS.—Slightly larger than the Maryland Yellow-throat; upperparts deeper olive, and more brownish on the head (olive-brown); yellow of underparts deeper (wax yellow); sides and flanks darker buffy brown. (Plate 53.)

RANGE.—Breeds in Florida and the southern parts of the Gulf States west to Louisiana, and north to central Alabama, central Georgia, and the coast region of the Carolinas. Winters in southern Alabama, southern Georgia, and the coast region of South Carolina.

DISTRIBUTION IN FLORIDA.—A common resident throughout the State, except on the Keys; less common in winter. The species has been reported in the breeding season at Pensacola, St. George Island, St. Marks, McIntosh, Mayo, Sebring, Lake Washington, Tarpon Springs, Anclote Keys, Citrus Center, Rocky Lake (Hendry County), Miakka Lake, Deep Lake, Everglade, Royal Palm Hammock, and many other places. Specimens have been examined from Key West, May 3, 1889, and Golden Eagle Key (Newfound Harbor Group), May 11, 1919. In January and February, 1918, I found the birds fairly numerous about cultivated lands at Homestead, and in thick scrub and tall switch grass on the prairies at Cape Sable. Almost nothing is known concerning the migrations of this race, as the birds killed at the lighthouses have not been identified subspecifically; probably some individuals migrate to Cuba.

HAUNTS AND HABITS.—The Florida Yellow-throat inhabits thickets and brier patches, being especially partial to wet situations, such as the borders of streams, lakes, and sloughs. The birds are common along the canals in the Everglades, and in the floating vegetation on the upper St. Johns River near Lake Washington, and are found in smaller numbers in dry palmetto thickets on the prairies or in the forests. They are rather shy, and on being disturbed take refuge in the depths of the thickets in which they live, and voice their alarm with a characteristic burring *chink*. In singing they usually come out to the edge of the thicket or fly to a low perch on the bush or tree. The song resembles that of the northern yellow-throats in general, but has a peculiar turn in it that appears to be a local variation.

The nests are placed in clumps of grass in marshy situations, and sometimes in bushes or thickets on dry ground. A nest with 5 eggs was noted in a marsh at Apalachicola, May 6, 1926. Eggs were reported at Tampa, April 10, 1892; St. Marks, April 12, 1919; Leon County, April 26, 1926; and on the Caloosahatchee River, June 9, 1903.

FOOD.—The stomachs of 7 specimens collected in Florida have been examined in the Biological Survey; these showed the food to consist mainly of insects, with a few spiders and small mollusks, and a small number of seeds of the sweet gale. Of the insects eaten, Orthoptera (grasshoppers, crickets, etc.) composed the largest amount, with Hymenoptera (ants, wasps, and bees) next in importance. Other insects found in quantity were beetles, bugs, flies, and caterpillars. Spiders were eaten in small numbers.

YELLOW-BREASTED CHAT: *Ictéria vírens vírens* (Linnaeus)

RECOGNITION MARKS.—Nearly as large as the Catbird (length, 6.75 to 7.50 inches; spread, 9.00 to 10.00 inches). *Summer plumage:* Head and upperparts deep olive; lores black; sides of head deep neutral gray; eye ring white; throat, breast, and part of belly light cadmium or lemon chrome; lower belly white, tinged with drab; wings and tail fuscous, edged with olive. *Winter plumage:* Similar, but upperparts more brownish olive.

RANGE.—Breeds from southern Minnesota, southern Wisconsin, southern Michigan, southern Ontario, central New York, and southern New England south to southeastern Texas, southern Alabama, and northern Florida. Winters from southern Mexico to Costa Rica, and casually in Florida.

DISTRIBUTION IN FLORIDA.—Occurs as a very rare migrant and a rare breeder at a few points in the extreme northern part. Worthington records it fairly common on

PLATE 53

EXPLANATION OF PLATE 53

WOOD WARBLERS

The upper figure is a male Parula Warbler; below it, on the same branch, are a female Parula and a female Bachman's Warbler; on the branch in the middle of the picture are (left to right) a male Bachman's Warbler, a Prothonotary and a Swainson's Warbler; at the lower left is a female Florida Yellow-throat, in the lower center a male Florida Yellow-throat, and above it on the same branch, a male and a female Hooded Warbler.

AQUES

Amelia Island, and Williams reports it a rare breeder at Tallahassee. Weston considers it a rare spring migrant at Pensacola, but he observed two birds June 9 and 10, 1928, in full song, which probably were breeding. Stoddard reports it a fairly common breeder in open "loblolly" woodlands in northern Leon County, near Lake Iamonia; a few were noted by him, also, in the sandhills of lower Jefferson County, June 5, 1925.

The earliest migrants were recorded at Titusville, April 9, 1889; Pensacola, April 23, 1922, and April 26, 1926; and Amelia Island, May 9, 1906. In fall migration, one bird was seen at Melrose, July 30, 1915, and one at Quincy, September 25, 1900. T. D. Burleigh observed a single individual on Key Largo, December 10, 1929, and W. S. Blatchley (1931, p. 145) records one seen at Dunedin, December 14, 1916.

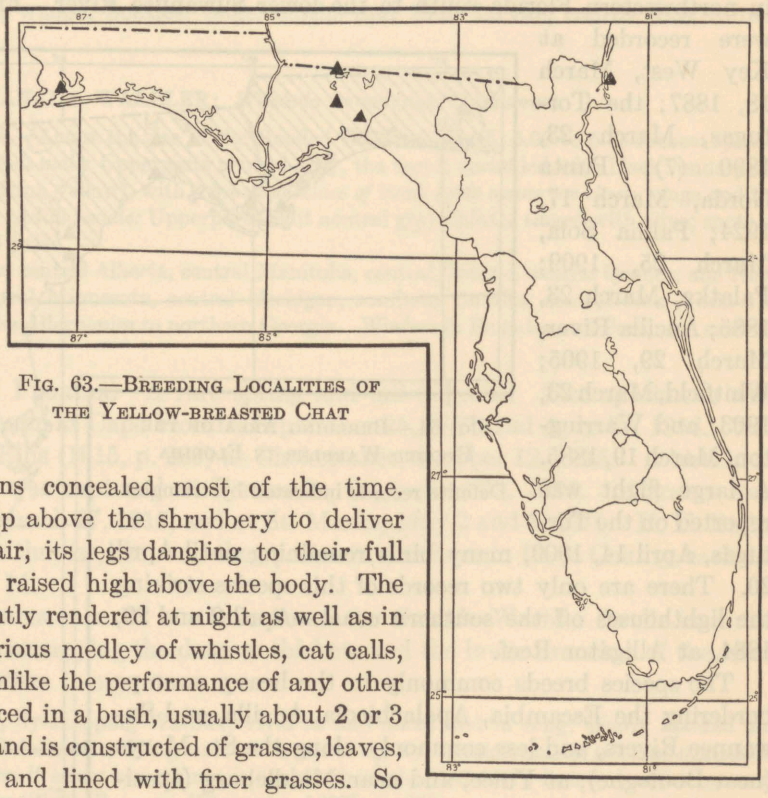

FIG. 63.—BREEDING LOCALITIES OF THE YELLOW-BREASTED CHAT

HAUNTS AND HABITS.—The Chat is a shy and eccentric bird, dwelling in upland thickets and brushy clearings, where it remains concealed most of the time. Occasionally it flies up above the shrubbery to deliver its odd song in the air, its legs dangling to their full length and the wings raised high above the body. The song, which is frequently rendered at night as well as in the daytime, is a curious medley of whistles, cat calls, and chuckles, quite unlike the performance of any other bird. The nest is placed in a bush, usually about 2 or 3 feet from the ground, and is constructed of grasses, leaves, and grapevine bark, and lined with finer grasses. So suspicious is the bird of intrusion that one is rarely flushed from the nest, and if a nest is disturbed it is often deserted by the owners.

FOOD.—The Chat feeds largely on insects, including beetles, bugs, ants, weevils, bees, wasps, May flies, and various caterpillars, such as tent caterpillars and currant worms. It is said to be fond of wild strawberries and takes also considerable other wild fruit, such as blackberries, raspberries, whortleberries, elderberries, and wild grapes. The stomachs of 7 specimens taken on Amelia Island in May and June contained insects and fruit pulp in about equal proportions, with a few spiders and small crustaceans. The insects included moths and their larvae, beetles, bugs, ants, wasps, and grasshoppers. The fruit consisted of blueberries and blackberries.

HOODED WARBLER: *Wilsónia citrína* (Boddaert)

RECOGNITION MARKS.—About the size of the Kentucky Warbler (length, 5.00 to 5.75 inches; spread, 8.00 to 8.50 inches). *Adult male:* Forehead, sides of head, and most of underparts lemon chrome; *a black mask covering the hinder part of crown and the nape, joining the black throat patch;* back and rump warbler green. *Adult female:* Similar to the male, but *without the black mask.* (Plate 53.)

RANGE.—Breeds from southeastern Nebraska, southern Iowa, southwestern Michigan, central New York, and the lower Connecticut Valley south to the Gulf coast and northern Florida. Winters from Vera Cruz and Yucatan to Panama. Occasional in the Bahamas, Cuba, and Jamaica.

DISTRIBUTION IN FLORIDA.—An abundant migrant, and a common summer resident in northwestern Florida south to the lower Suwannee River. First arrivals in spring were recorded at Key West, March 18, 1887; the Tortugas, March 23, 1890 (7); Punta Gorda, March 17, 1924; Palma Sola, March 25, 1909; Palatka, March 23, 1885; Aucilla River, March 29, 1905; Whitfield, March 23, 1903; and Warrington, March 19, 1885. A large flight was reported on the Tortugas, April 14, 1909, many birds remaining until April 20. There are only two records of this species striking the lighthouses off the southern coast—April 2 and 29, 1884, at Alligator Reef.

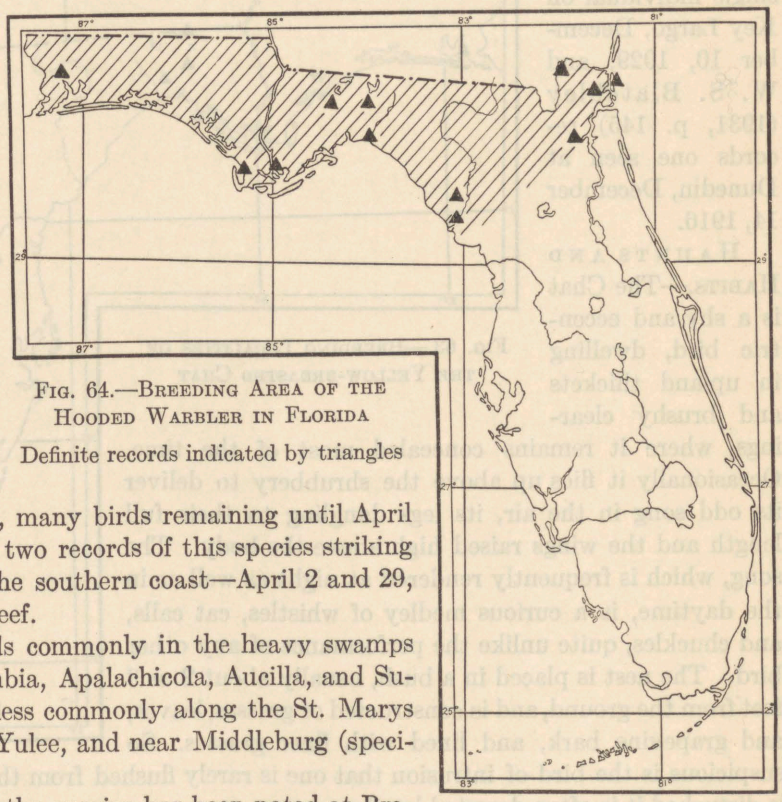

FIG. 64.—BREEDING AREA OF THE HOODED WARBLER IN FLORIDA

Definite records indicated by triangles

The species breeds commonly in the heavy swamps bordering the Escambia, Apalachicola, Aucilla, and Suwannee Rivers, and less commonly along the St. Marys (near Boulogne), at Yulee, and near Middleburg (specimen, June 4, 1929).

In fall migration the species has been noted at Bradenton, July 29, 1925; Oxford, August 2, 1920; Tarpon Springs, August 6, 1890, and September 17, 1886; Palma Sola, September 9 to 20, 1912; Key West, August 30 and September 13, 1887, and August 19, 1889; and on the Tortugas, July 30 and August 13 to 23, 1925. The last were seen at Pensacola, October 20, 1929; De Funiak Springs, October 17, 1908; Tallahassee, October 20, 1904; and Fort Pierce, November 1, 1918.

HAUNTS AND HABITS.—The Hooded Warbler is a lover of low, moist, deciduous woodland, with dense undergrowth. The birds dwell chiefly in the lower stories of the forest, and as they flit about in the shrubbery, displaying their bright colors and the white outer

tail feathers, they are both conspicuous and attractive. They are very active, and procure much of their insect prey upon the wing. The alarm note is a characteristic sharp *cheep*, and the song is a loud, whistled, strongly-accented ditty, subject to much variation. One of the songs is rendered by Allison (Chapman, 1907b, p. 273), "*Whee-whee-wheé-a-wheér*, accented as marked." The nest is placed usually in a small bush, 2 or 3 feet from the ground; it is compactly woven of strips of bark and plant down, and lined with fine grasses, weed stems, and rootlets. Grimes (1931a, p. 85) records a nest found near Jacksonville, June 5, 1930, from which the young had recently flown.

FOOD.—Examination of the stomachs of 6 specimens from Florida showed the food to consist of flies, ants, wasps, beetles, bugs, moths and their larvae, caddis flies, roundworms, and spiders.

CANADA WARBLER: *Wilsónia canadénsis* (Linnaeus)

RECOGNITION MARKS.—About the size of the Hooded Warbler (length, 5.00 to 5.75 inches; spread, 7.75 to 8.25 inches). *Adult male:* Upperparts neutral gray, the crown sprinkled with black; underparts strontian yellow (dark citron yellow), with *a broad necklace of black spots across the chest;* wings and tail hair brown (dark drab). *Adult female:* Upperparts light neutral gray, faintly tinged with olive; spots on chest much reduced and paler.

RANGE.—Breeds from central Alberta, central Manitoba, central Ontario, central Quebec, and Newfoundland south to central Minnesota, central Michigan, southern Ontario, central New York, and Massachusetts, and in the Alleghenies to northern Georgia. Winters in Ecuador and Peru, and casually in Guatemala.

DISTRIBUTION IN FLORIDA.—A rare spring and fall migrant. Two specimens were collected by Würdemann at Cape Florida, September 25, 1857, and April 28, 1858. Two were taken by J. B. Ellis (1915, p. 209) at Chokoloskee, October 12, 1915. A bird in an exhausted condition was captured at Pensacola, September 22, 1926. Migrants were noted at Princeton, March 17, 1915, and at St. Marks, May 2 and 5, 1919. H. H. Bailey (1925a, p. 133) states that he has seen the species in numbers in Dade County each fall from October 10 to 14.

HAUNTS AND HABITS.—In its northern home the Canada Warbler dwells in moist, deciduous woodland, occupying the densest thickets and the lower branches of the trees. Gerald Thayer describes it as—

> a sprightly, wide-awake, fly-snapping Warbler, vivid in movement and in song; clearly marked and brightly colored. . . . It darts after flying insects like one of the Tyrannidae, and its bill may sometimes be heard to "click" when it seizes something; it has much of the Redstart's insistent nervousness of motion, but is a less airy "flitter". . . . (Chapman, 1907b, p. 283).

AMERICAN REDSTART: *Setóphaga ruticílla* (Linnaeus)

RECOGNITION MARKS.—Length, 4.75 to 5.50 inches; spread, 7.50 to 8.00 inches; bill short and broad at base. *Adult male:* Upperparts, throat, and breast lustrous brownish black; *sides of breast and under wing coverts salmon-orange;* belly white; wings fuscous, *with a large patch of ochraceous-salmon;* tail fuscous at tip, *ochraceous-salmon at base. Adult female and immature male:* Top of head mouse gray; upperparts grayish olive; breast patches and *wing linings wax yellow; wing and tail patches maize yellow.*

RANGE.—Breeds from central British Columbia, central Mackenzie, central Manitoba, central Quebec, and Newfoundland south to Washington, Utah, Colorado, Oklahoma, Arkansas, southern Alabama, and northern Georgia. Winters in the West Indies, and from central Mexico to Ecuador and British Guiana.

DISTRIBUTION IN FLORIDA.—An abundant spring and fall migrant. As the species winters in large numbers in Cuba, thousands of the birds pass the lighthouses off the southern end of Florida, and there is available a long series of records covering the years 1884–89. The earliest migrant noted at Sombrero Key was a single bird seen in the daytime, March 31, 1889; the first birds to strike the light there were recorded on April 3, 1889 (10), and April 12, 1889. Specimens were collected on the Tortugas, March 30, and April 2 and 5, 1890; and small numbers were observed there by Bartsch, May 13 to 22, 1922. A specimen taken at Key West, March 6, 1890, may have wintered there. J. T. Nichols reported the species at Sandy Key, April 1, 1917. Migrants were recorded in small numbers on Sombrero Key on many nights during April and May, until May 20 (1888). On May 5, 1888, 50 birds struck the light and 8 were killed.

On the mainland, the earliest migrants were noted on the lower Suwannee River, March 22, 1890; at Seven Oaks, April 8, 1902; Gainesville, April 7, 1887; Seabreeze, April 3, 1901; Amelia Island, April 7, 1916; St. Marks, April 10, 1917; and Pensacola, April 13, 1924. The last seen in spring were reported at Winter Park, May 16, 1914; Palma Sola, May 17, 1913; Brooksville, May 19, 1929; Taft, May 20, 1929; Mosquito Inlet Light, May 21, 1925 (4 females killed); and Daytona Beach, May 29, 1927.

Fall migration begins early, the dates of first arrivals on Sombrero Key being July 28 and 29, 1886. Migrants were recorded there on many nights during August, September, and October, the last on November 4 (1888). The largest flights were on September 17 and 18, 1887, on each of which nights more than 150 birds were counted and a total of about 50 were killed. On October 3, 1888, 115 birds were noted, and 75 on October 17, 1887. At Key West, migrants were reported on August 9, 1887, and July 22, 1889. On the mainland, first arrivals in fall were recorded at Pensacola, August 8, 1919; Tallahassee, August 12, 1904; New Smyrna, July 27, 1899; Daytona Beach, August 5, 1911; Palma Sola, July 23, 1908; and Princeton, August 6, 1916. The last observed in fall were reported at Pensacola, October 26, 1919, and November 19, 1929; New Smyrna, October 31, 1924; Winter Park, October 24, 1913; Fort Pierce, November 2, 1918; and Fort Drum, November 3, 1888.

HAUNTS AND HABITS.—The Redstart is conspicuous for so small a bird because of its brilliant colors and its active, sprightly manner. Dwelling in heavy, deciduous woodland, it occupies chiefly the middle or upper portions of the trees, and is almost constantly in motion, darting and whirling about in the foliage in pursuit of its insect prey, spreading its tail widely and displaying every mark of its plumage to good advantage. The song is a hurried utterance that has been aptly compared to the sound produced by blowing through a little circular tin whistle held between the lips and teeth, the air being alternately inhaled and exhaled. The notes are all staccato, of a shrill, penetrating quality, the last or next to the last strongly accented.

FOOD.—Forbush (1907, p. 197) says of this species:

> The insect food of the Redstart is perhaps more varied than that of any other common Warbler. Apparently there are few forest insects of small size that do not, in some of their forms, fall a prey to this bird. Caterpillars that escape some of the slower birds by spinning down from the branches and hanging by their silken threads are snapped up in mid air by the Redstart. . . . It is an efficient caterpillar hunter, and one of the most destructive enemies of the smaller hairy caterpillars. It catches bugs,

moths, gnats, two-winged flies, small grasshoppers, and beetles. It probably secures a larger proportion of parasitic Hymenoptera and Diptera than most other Warblers, occasionally destroying a few wasps; otherwise, its habits seem to be entirely beneficial.

WEAVER FINCHES: Family Ploceidae

ENGLISH SPARROW: *Pâsser domésticus domésticus* (Linnaeus)

Other Name: House Sparrow (in Europe)

Range.—Great Britain; introduced and naturalized in the greater part of the United States and southern Canada.

Distribution in Florida.—Introduced into America in 1850 at Brooklyn, New York, and subsequently at many other places, the English Sparrow soon spread into adjacent regions, and by 1882 it had reached Lake City, Florida. In the autumn of 1886 the birds were reported from Cerro Gordo, Crescent City, and Tampa (Barrows, 1889, p. 203). At present the species is found in all the cities and towns as far south as Homestead, and on most farms, except in the wilderness.

Haunts and Habits.—The English Sparrow is essentially a "house-sparrow," living chiefly in cities and villages, but spreading out on to the surrounding farms. The bulky nests of these birds, made of dry grass, straw, twine, and feathers, are placed in a variety of situations—in crevices about the eaves of houses, barns, or outbuildings, in or behind gutters and spouts, in vines climbing over buildings, in bird boxes, or in the branches of shade trees. The eggs number from 4 to 7, and three or more broods may be raised in a season. When the young are nearly grown, the birds gather into flocks and forage on farm lands or about city dumps. At night they roost in thick vines, crevices of buildings, and even in bare trees on city streets. Lacking any song, noisy and pugnacious in disposition, these Sparrows are everywhere considered a pest.

The injurious habits of the English Sparrow consist chiefly of damage to garden vegetables (such as peas and lettuce), destruction of grain in the field or stack (chiefly wheat, oats, corn, barley, and sorghum), injury to fruits (chiefly grapes, cherries, strawberries, and raspberries), consumption of feed intended for poultry, molesting and driving away native birds, and defacement of buildings.

Food.—Examination in the Biological Survey of 522 stomachs of this bird gave the following results:

Wheat was found in 22 stomachs, oats in 327, corn (maize) in 71, fruit seed (mainly of mulberries) in 57, grass seed in 102, weed seed in 85, undetermined vegetable matter in 219, bread, rice, etc., in 19, noxious insects in 47, beneficial insects in 50, insects of no economic importance in 31. Doubtless most of the oats found in the stomachs were obtained from horse droppings, and some of the undetermined vegetable matter was from the same source (Barrows, 1889, p. 143).

MEADOWLARKS, BLACKBIRDS, and ORIOLES: Family Icteridae

BOBOLINK: *Dolichónyx oryzívorus* (Linnaeus)

Other Names: Rice Bird; Reed Bird; Oat Bird

Recognition Marks.—Smaller than the Red-winged Blackbird, with stout, sparrowlike bill (length, 6.5 to 7.5 inches; spread, 10.5 to 12 inches). *Adult male in breeding plumage:* Body and wings black; nape pale pinkish buff; scapulars, back, and rump white. *Adult female in breeding plumage:* Upperparts

light grayish olive, blotched with fuscous-black; underparts pale buff, the throat and middle of belly white. *Male in autumn:* Similar to the breeding female, but darker, the upperparts buffy brown, the breast dark cinnamon-buff. (Plate 54.)

RANGE.—Breeds from southeastern British Columbia, central Alberta, central Saskatchewan, central Ontario, central Quebec, and Cape Breton Island south to northern Nevada, Utah, northern Missouri, Ohio, Pennsylvania, and New Jersey. Winters in South America south to southern Brazil. Occurs in migration in the West Indies. Casual in California.

DISTRIBUTION IN FLORIDA.—An abundant spring and fall migrant throughout the State. Immense numbers of the birds pass up and down the east coast on their journeys to and from South America *via* the West Indies, and in stormy weather many strike the lighthouses along the coast. At Alligator Reef Light, on the nights of October 2, 4, and 10, 1888, the keeper reported about 3,000 birds striking each night, the numbers killed being respectively, 378, 272, and 355 on the three nights. The earliest arrivals in spring at Sombrero Key Light were on April 4, 1886, April 8, 1887, and April 5, 1902. The first birds were noted at Palma Sola, April 10, 1913; Old Town, April 15, 1892; St. Augustine Light, April 20, 1884; St. Marks, April 9, 1914; Chipley, April 13, 1904; and Pensacola, April 20, 1919. The last in spring were observed on the Tortugas, May 20, 1922; at Lake Worth, May 22, 1889; Arcadia, May 30, 1920; Palma Sola, May 26, 1906; Gainesville, May 25, 1887; the mouth of the Suwannee River, May 26, 1926; and McIntosh, June 7, 1926.

First migrants in fall appeared at Pensacola, August 31, 1919; St. Marks, August 30, 1917; Orlando, August 12, 1909; Arcadia, August 21, 1919; Fort Myers, August 9, 1916 (flock of 50); Palma Sola, August 20, 1908; Alligator Reef Light, August 23, 1889; and the Tortugas, August 23, 1925. The last birds were recorded at De Funiak Springs, November 15, 1909; Orlando, November 4, 1920; Fowey Rocks Light, November 25, 1887; Alligator Reef Light, November 28, 1884; Sombrero Key Light, November 13, 1884; and the Tortugas, November 1, 1918. The birds are reported abundant in spring and fall at Key West, and have been seen on Marquesas Keys.

HAUNTS AND HABITS.—The Bobolink in its summer home lives in the hay meadows of the Northern States. In their southward migration in autumn, the birds resort chiefly to marshes in which wild rice or cultivated rice is growing, and in spring, when going northward, they visit grain fields and meadows as well as the marshes. They travel in flocks, often of considerable size. The males arrive in spring a few days ahead of the females, but later the sexes become mixed in the flocks. In spring the birds are bubbling over with music, but in fall, after having assumed the streaked, buffy plumage, they utter only a metallic *chink*, which is characteristic.

FOOD.—During the breeding season Bobolinks feed almost exclusively on insects, such as beetles, wasps, ants, and caterpillars. The animal food found in nearly 300 stomachs (Beal, 1900, pp. 12–22) amounted to about 58 per cent of the total food for the year, but this creditable record is partly offset by the serious damage that the birds commit in the grain fields of the South during their migrations. Wherever rice is cultivated along the Atlantic coast, in order to obtain a crop it is necessary to keep men constantly employed shooting over the rice fields to kill or scare away the Bobolinks.

Nehrling (1906, p. 15) states that Bobolinks are often seen in central Florida in

orange groves, where they feed on beggarweed seed. Every one of 15 Bobolinks collected in celery fields near Sanford had fed on the destructive celery leaf-tyer (*Phlyctaenia rubigalis*), the remains of this insect forming 67 per cent of the total food in their stomachs.

SOUTHERN MEADOWLARK: *Sturnélla mágna argútula* Bangs

OTHER NAME: Fieldlark

RECOGNITION MARKS.—About the size of the Robin (length, 8.50 to 10 inches; spread, 13.50 to 16 inches; wing of male, 4.13 to 4.75 inches; of female, 3.75 to 4.00 inches); tail feathers narrow and pointed, the outer ones white, *showing in flight.* Upperparts brown, varied with black and buff; underparts lemon chrome, with *a large black crescent* on the breast.

RANGE.—Resident in southeastern United States from southern Florida and the Gulf coast west to southeastern Texas, and north to North Carolina, northern Alabama, and southern Illinois.

DISTRIBUTION IN FLORIDA.—An abundant resident in all parts of the mainland. Specimens have been examined from Southport, St. Marks, Merritt Island, Punta Gorda, Manatee, Everglade, Royal Palm Hammock, and Cape Sable.

HAUNTS AND HABITS.—Meadowlarks are lovers of grassy meadow lands and are thus most abundant on the prairies of central and southern Florida. They occur also in numbers throughout the open pine flats and about cultivated lands. Their nests are placed on the ground, well concealed in thick grass, and are made of fine dry grasses with an arched roof. Eggs were found at Taylor's Creek, Okeechobee County, February 20, 1910 (exceptionally early); Orlando, March 27, 1909; Istokpoga Lake, April 10, 1923; Tarpon Springs, April 11, 1897; Immokalee, April 15, 1919; Seven Oaks, May 7, 1906; Plant City, May 14, 1929; and Jacksonville, May 16 and June 20 and 23, 1930. The usual number of eggs in a set is 3 or 4, occasionally 5.

In the wilder parts of the State the birds are very tame, but near the cities, where they are hunted more or less, they become more suspicious. After the breeding season, they gather into flocks and forage in cultivated lands and in marshes. Their flight is steady, alternating a few flaps with much sailing. Their alarm note is a sharp *dzit;* the song is a sweet, plaintive whistle of several notes.

FOOD.—The Meadowlark feeds chiefly on insects, these forming nearly three-fourths of its food for the year. Crickets and grasshoppers are the most important insects taken, constituting about one-fourth of the total food for the year, and nearly three-fourths of the food in August. "Of the 1,514 stomachs collected at all seasons of the year, 778, or more than half, contained remains of grasshoppers, and one was filled with fragments of 37 of these insects" (Beal, 1915b, p. 14). Beetles, cotton-boll weevils, caterpillars, and cutworms are among the other insects taken by the Meadowlark. The vegetable food consists of grain, most of which is waste, taken in winter and early in spring, and of weed seed.

EASTERN MEADOWLARK: *Sturnélla mágna mágna* (Linnaeus)

RECOGNITION MARKS.—Similar to the southern race, but larger (wing of male, 4.50 to 5.20 inches; of female, 4.13 to 4.50 inches). Upperparts averaging paler; yellow of underparts somewhat paler.

RANGE.—Breeds from eastern Minnesota, southern Ontario, southern Quebec, and New Brunswick south to northern Texas, Tennessee, and North Carolina, and west to eastern Kansas and north-

western Texas. Winters from the Potomac and Ohio Valleys (locally to the Great Lakes and southern New England) south to the Gulf States.

DISTRIBUTION IN FLORIDA.—Known at present only from three specimens in the Carnegie Museum, at Pittsburgh, Pennsylvania, taken at Whitfield, Walton County, by W. W. Worthington, December 1 and 4, 1902, and February 23, 1903. Further collecting will very likely show a more extensive range for the bird in winter.

YELLOW-HEADED BLACKBIRD: *Xanthocéphalus xanthocéphalus* (Bonaparte)

RECOGNITION MARKS.—Larger than the Red-winged Blackbird (length, male, 10 to 11 inches; female, 8 to 9.5 inches; spread, 14 to 17 inches); tail nearly even. *Adult male:* Head, throat, and breast cadmium yellow or orange; rest of body brownish black. *Adult female:* Dark hair brown, the throat and breast lemon yellow or pale orange.

RANGE.—Breeds from southern British Columbia, southern Mackenzie, and central Manitoba south to southern California, Arizona, and southern Mexico, and east to southern Wisconsin, and northern Illinois and Indiana. Winters from southern California, southern Arizona, and southern Louisiana to southern Mexico. Accidental in various eastern localities from Ontario and Quebec to Florida and Cuba.

DISTRIBUTION IN FLORIDA.—Known from four records, as follows: A specimen, formerly in the United States National Museum collection, taken at New Smyrna in the fall of 1871, by Henry Peters (Baird, 1874, vol. 2, p. 168); a bird seen by Mrs. Hiram Byrd at Royal Palm Hammock in October or November, 1917; one recorded by S. R. Ingersoll (1928a, p. 28), at New Smyrna, November 2, 1925; and a specimen in the Biological Survey collection, taken by H. L. Stoddard at Lake Jackson, September 27, 1925.

HAUNTS AND HABITS.—In the West, the Yellowhead breeds in large colonies in wet marshes. At other seasons the birds join with other species of blackbirds and forage extensively in cultivated fields.

EASTERN RED-WING: *Agelaïus phoeniceus phoeniceus* (Linnaeus)

OTHER NAMES: **Red-winged Blackbird; Marsh Blackbird; Swamp Blackbird**

RECOGNITION MARKS.—*Adult male:* Length, 8 to 9 inches; spread, 12 to 14 inches; wing, 4.50 to 5 inches; bill relatively short and thick at base; body wholly black with scarlet epaulets, bordered with buffy white. *Adult female:* Length, 7.50 inches; wing, 3.75 to 4.05 inches; bill short and thick at base; upperparts fuscous-black, more or less streaked with grayish white, light buff, and mikado brown (reddish brown), the brown edgings predominating in fresh winter plumage, but nearly obsolete in worn breeding plumage; underparts grayish white, streaked with fuscous or fuscous-black, the throat often tinged with pink or pale yellow.

RANGE.—Breeds from Ontario, Nova Scotia, and Quebec south to the coast of Georgia, northern Florida, and central Alabama. Winters from the Delaware and Ohio Valleys south to South Carolina and northern Florida. (Fig. 65.)

DISTRIBUTION IN FLORIDA.—Breeds in north central Florida south to Gainesville. Wintering birds have been taken at Lukens, February 8, 1907; and Sumner, February 18, 1907. Recent critical studies of the eastern Red-wings by the writer and A. J. van Rossem (1928, pp. 155–163) have shown that the typical race breeds at Gainesville. Since that paper was published we have examined 10 additional breeding specimens from the same locality, which serve to confirm our decision. The females (of which we have

seen 6 adults) are nearest to *phoeniceus* in color and in measurements of wing and tail, though nearer to *mearnsi* in shape of the bill; breeding specimens from Cherry Lake, Madison County, are likewise intermediate between *phoeniceus* and *mearnsi*.

FLORIDA RED-WING: *Agelaius phoeniceus mearnsi* Howell and van Rossem

OTHER NAMES: Rice Bird; Marsh Blackbird

RECOGNITION MARKS.—Slightly smaller than the typical race (wing of male, 4.30 to 4.66 inches; of female, 3.50 to 3.80 inches); bill longer and more slender; coloration of upperparts in females more brownish (less blackish); underparts more buffy (less whitish), the dark streaks more brownish. (Plate 54.)

RANGE.—Resident over the greater part of the Florida peninsula from the Okefenokee Swamp south to the lower Kissimmee and Caloosahatchee Valleys, and west on the Gulf coast to Apalachicola. (Fig. 65.) Breeding specimens have been examined from Anastasia Island, Merritt Island, Lake George, Orlando, Kissimmee Valley, Fort Myers, Pine Island (Charlotte Harbor), Cedar Keys, Grassy Island (Taylor County), St. Marks, Aucilla River (mouth), Lake Jackson, and other places. Specimens from Ortega, on the St. Johns River, and from Payne's Prairie and Orange Lake are intermediate between *mearnsi* and *phoeniceus*. Six breeding female specimens from Lake Jackson, Leon County, are referred to this race, although they are really intermediate between the three forms that meet in that region—*phoeniceus*, *mearnsi*, and *littoralis*.

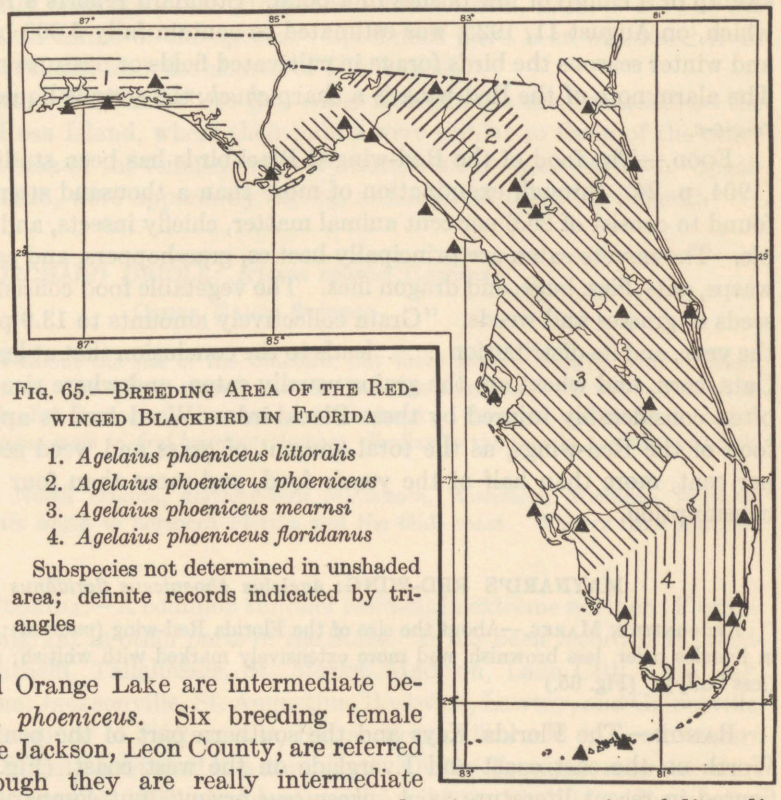

FIG. 65.—BREEDING AREA OF THE RED-WINGED BLACKBIRD IN FLORIDA

1. *Agelaius phoeniceus littoralis*
2. *Agelaius phoeniceus phoeniceus*
3. *Agelaius phoeniceus mearnsi*
4. *Agelaius phoeniceus floridanus*

Subspecies not determined in unshaded area; definite records indicated by triangles

This race has figured under several different names; in the third edition of the American Ornithologists' Union Check-List (1910) it was included under *floridanus*, and since 1911, following Mearns's revision, it has been called *phoeniceus*. Recently (Howell and van Rossem, 1928, p. 159) it has been shown to be separable from both these forms, and has been named *mearnsi*.

HAUNTS AND HABITS.—The Florida Red-wing is found in the breeding season chiefly around fresh-water ponds, sloughs, or marshes. The Everglades, before drainage operations were begun, supported an immense population, and even now, with large areas drained and under cultivation, the birds breed there abundantly, as also on the extensive marshes bordering the upper St. Johns and Kissimmee Rivers. A number of pairs are usually found nesting near together, their nests being placed in small bushes growing in shallow water or on marshes at a height of 1 to 8 feet above the water or the ground. The nests are compactly woven of the stems of saw grass or similar materials and firmly bound to the bush in which they are placed. Three eggs (rarely four) usually compose the clutch, and in central Florida these are laid from about the middle of April to the first of June.

After the breeding season the birds gather into large flocks, and at night the flocks assemble from a wide area and roost in a body in some selected spot, such as a reedy swamp or a clump of low bushes in a pond. Stoddard reports a roost in Lake Jackson, which, on August 11, 1925, was estimated to contain fully 5,000 birds. During the fall and winter seasons the birds forage in cultivated fields or pastures more than in marshes. The alarm note of the Red-wing is a sharp *chuck;* the song is liquid and resonant, *o-kal-re-e-e-e.*

FOOD.—The food of the Red-winged Blackbirds has been studied by Professor Beal (1904, p. 24), through examination of more than a thousand stomachs. The food was found to consist of 26.6 per cent animal matter, chiefly insects, and 73.4 per cent vegetable. The insects eaten are principally beetles, grasshoppers, and caterpillars, with a few wasps, ants, flies, bugs, and dragon flies. The vegetable food consists mainly of grain and seeds of grasses and weeds. "Grain collectively amounts to 13.9 per cent of the food of the year, and its distribution . . . leads to the conclusion that at least half of it is waste." Oats, corn, and wheat are the grains usually eaten, and where rice is grown that crop is often considerably injured by these Blackbirds. Weed seed is apparently the favorite food of the Red-wings, as the total amount of grass and weed seeds consumed is 54.6 per cent, more than half of the year's food, and more than four times the total grain consumption.

MAYNARD'S RED-WING: *Agelaius phoeniceus floridanus* Maynard

RECOGNITION MARKS.—About the size of the Florida Red-wing (*mearnsi*); coloration of upperparts in females paler, less brownish, and more extensively marked with whitish; underparts more whitish (less buffy). (Fig. 65.)

RANGE.—The Florida Keys and the southern part of the peninsula north to Lake Worth on the east coast and Everglade on the west coast. (Fig. 65.) This race has figured in recent literature as *A. phoeniceus bryanti,* but comparison of breeding birds from southern Florida with Bahama specimens shows that they are not the same, and that the Florida race is worthy of recognition under the name given to it by Maynard. Specimens have been examined from Lake Worth, Tamiami Trail (20 miles west of Miami), Bear Lake, East Fox Lake, Alligator Lake, Flamingo, Everglade, Shark River, Big Pine Key, Key West, Coconut Grove, and Lemon City.

HAUNTS AND HABITS.—In general, this race has about the same habits as the more northern races. Maynard, however (1881, p. 136), tells of finding the birds on one of the smaller keys, on which there were no bushes or grass, nesting in hollow buttonwood trees[1]. In the Everglades near Royal Palm Hammock, June 12, 1918, I found nests with eggs and young in a saw-grass marsh and in low bushes. At Cape Sable in February, 1918, I observed a flock of about 40 birds going to roost in a little cat-tail slough on the marshes.

GULF COAST RED-WING: *Agelaius phoeniceus littoralis* Howell and van Rossem

RECOGNITION MARKS.—Similar in size and shape of bill to the northern race (*phoeniceus*); coloration of females darker, both above and below, particularly on the rump; ground color of underparts less buffy (more whitish), the dark streaks broader and averaging more blackish.

RANGE.—Gulf coast region from Choctawhatchee Bay west to Galveston, Texas. (Fig. 65.)

This race has recently been described (Howell and van Rossem, 1928, p. 157) as the darkest of all the eastern forms of the species. Specimens have been examined from Whitfield, Santa Rosa Island, and the shores of Big Lagoon.

HAUNTS AND HABITS.—We found these Red-wings living in the small marshes on the inner shores of Santa Rosa Island, where their habits were similar to those of the other races. The dark coloration of the females was very noticeable even in the field. Specimens taken April 19, 1926, were apparently laying, although no nests were found.

ORCHARD ORIOLE: *Icterus spurius* (Linnaeus)

OTHER NAME: Swinger

RECOGNITION MARKS.—About the size of the Bluebird, but more slender (length, 6 to 7 inches; spread, 9 to 10 inches). *Adult male:* Head, throat, and fore back black; rest of body russet. *Adult female:* Upperparts yellowish olive shaded with hair brown (dark drab) on the middle of the back; underparts greenish yellow. *Young male in first breeding plumage:* Similar to the female, but throat black. (Plate 55.)

RANGE.—Breeds from North Dakota, northwestern Minnesota, Wisconsin, Michigan, southern Ontario, and Massachusetts south to northern Florida and the Gulf coast. Winters from southern Mexico to Colombia.

DISTRIBUTION IN FLORIDA.—A common summer resident in extreme northern Florida, and a spring and fall migrant in other parts of the State. It has been recorded as breeding at Pensacola, Whitfield, Tallahassee, St. Marks, Madison, Lake City, Live Oak, Waukeenah, Fernandina, Jacksonville, St. Augustine, Bostwick, Lawtey, and Gainesville. It is of rare occurrence south of Jacksonville, but at Fernandina and in northwestern Florida from Jefferson County westward it is abundant. On the Tortugas, migrants were reported April 11, 1890, April 14, 1909 (abundant), and April 26 to 28, 1914. There is but one record from Key West—April 29, 1887. First arrivals were noted at Marco, April 6, 1917; Punta Gorda, April 3, 1926; Seven Oaks, April 2, 1909; Micanopy, April 1, 1909; Tallahassee, March 23, 1902; De Funiak Springs, March 15, 1902; and Pensacola, March 23, 1885. Late migrants were recorded at Chokoloskee, May 8, 1910, and at Bradenton,

[1] Probably *Conocarpus erecta.*

May 19, 1925. The last observed in summer were noted at Pensacola, August 10, 1919; De Funiak Springs, August 10, 1909; Tallahassee, August 16, 1904; Orlando, September 2, 1914; and Royal Palm Hammock, October 13, 1917.

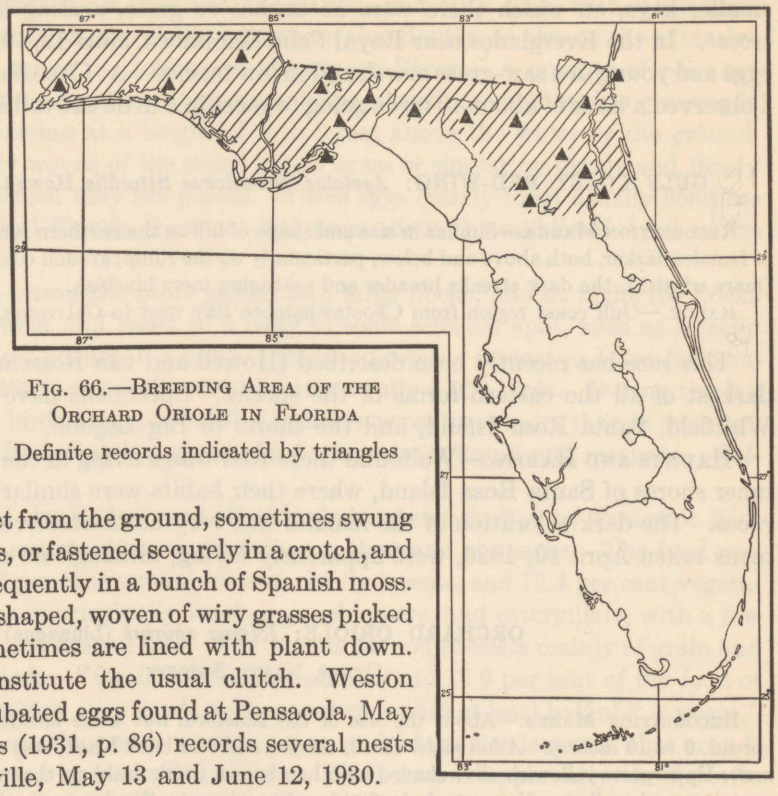

FIG. 66.—BREEDING AREA OF THE ORCHARD ORIOLE IN FLORIDA
Definite records indicated by triangles

HAUNTS AND HABITS.—The Orchard Oriole, as its name indicates, lives in orchards and on cultivated lands where there are trees or hedges; it is frequently found, also, in shade trees along village streets. The nests are placed in trees of many different species, 5 to 40 feet from the ground, sometimes swung from the slender limbs, or fastened securely in a crotch, and in the South not infrequently in a bunch of Spanish moss. They are deeply cup-shaped, woven of wiry grasses picked while green, and sometimes are lined with plant down. Four to six eggs constitute the usual clutch. Weston reports a set of 4 incubated eggs found at Pensacola, May 20, 1923, and Grimes (1931, p. 86) records several nests found near Jacksonville, May 13 and June 12, 1930.

FOOD.—This Oriole is one of our most useful birds, feeding almost entirely on insects, such as May flies, grasshoppers, beetles, rose bugs, cankerworms, cabbage worms, ants, and the destructive cotton-boll weevil.

BALTIMORE ORIOLE: *Ícterus gâlbula* (Linnaeus)

OTHER NAMES: **Fire Bird; Hang-nest; Golden Robin**

RECOGNITION MARKS.—Larger than the Orchard Oriole (length, 7 to 8 inches; spread, 11 to 12 inches). *Adult male:* Head, throat, and fore back black; rest of body orange; tail orange-yellow, marked with fuscous-black; a prominent white wing bar. *Adult female:* Underparts cadmium yellow, the throat speckled with blackish; head, neck, and fore back dull yellow, spotted with fuscous; tail dusky yellow, without black. (Plate 55.)

RANGE.—Breeds from central Alberta, central Saskatchewan, Manitoba, Ontario, New Brunswick, and Nova Scotia south to northern Texas, central Louisiana, northern Alabama, and northern Georgia, and west to Montana, Wyoming, and Colorado. Winters from southern Mexico to Colombia, and casually in Florida. Accidental in Cuba.

DISTRIBUTION IN FLORIDA.—A rare spring and fall migrant; occasionally seen in winter. Single birds were noted at Punta Gorda, April 14, 1925; Eau Gallie, April 13,

1910; Canaveral (struck the light), April 15, 1902; Hog Island, Pinellas County, April 13, 1899; Pass-a-Grille, May 5, 1928; Tarpon Springs, April 28, 1928; Sumner, April 1, 1922; New Smyrna, March 23, 1913, and April 12 and 23, 1918; Amelia Island, May 13, 1907; Whitfield, April 16, 1903; and Pensacola, April 10, 1886, May 3, 1919, and April 23, 1928.

For fall migration there is only one record—a bird seen at Princeton, September 13, 14, and 16, 1916. In winter, the species was recorded at Arcadia, December 24 and 26, 1919; Gainesville, December 15, 1886, and February 4, 1887 (Chapman, 1888a, p. 273); Coconut Grove, a single female seen February 20, 21, and 22, and March 1, 1925 (Chapman); Miami, December 26, 1903; and New Smyrna, January 27, 1931 (Ingersoll, 1931b, p. 66). A female collected at Tallahassee, March 3, 1902, may have been a wintering bird or a very early migrant. A specimen was taken on Garden Key, Tortugas, about 1859, and sent to the National Museum.

HAUNTS AND HABITS.—In its summer home in the North, the Baltimore Oriole often lives in tall trees along village streets, hanging its deep, purse-shaped nest near the extremity of a slender limb. Its song is a loud, prolonged, cheerful warble, often uttered while on the wing, and between the strains of the song the bird keeps up a more or less continuous series of *chirrups*, or whistles.

FOOD.—Writing of the food habits of this Oriole, Professor Beal (1915b, p. 13) says:

> Observation both in the field and laboratory shows that caterpillars constitute the largest item of the fare of the oriole. In 204 stomachs they formed 34 per cent of the food, and they are eaten in varying quantities during all the months in which the bird remains in this country. The fewest are eaten in July, when a little fruit also is taken. The other insects consist of beetles, bugs, ants, wasps, grasshoppers, and some spiders. The beetles are principally click beetles, the larvae of which are among the most destructive insects known; and the bugs include plant and bark lice, both very harmful, but so small and obscure as to be passed over unnoticed by most birds. Ants are eaten mostly in spring, grasshoppers in July and August, and wasps and spiders with considerable regularity throughout the season.

In the vineyards of the Northern States, these Orioles do some damage by puncturing grapes.

RUSTY BLACKBIRD: *Eúphagus carolínus* (Müller)

OTHER NAME: Rusty Grackle

RECOGNITION MARKS.—About the size of the male Red-winged Blackbird (length, 8.25 to 9.50 inches; spread, 13 to 15 inches). *Adult male in winter plumage:* Upperparts, wings, and tail greenish black, heavily overlaid on head and fore back with brown (warm sepia or Vandyke brown); underparts similar, overlaid with clay color; iris light yellow. *Adult female in winter plumage:* Similar to the male, but duller. *Adult male in breeding plumage:* Glossy greenish black (the brownish tips of the winter plumage having worn away). *Adult female in breeding plumage:* Upperparts deep mouse gray; underparts mouse gray.

RANGE.—Breeds from northern Alaska, northern Mackenzie, and northern Quebec south to central Alberta, central Ontario, New York, northern New England, New Brunswick, and Nova Scotia. Winters mainly south of the Ohio and Delaware Valleys to the Gulf coast and southern Florida.

DISTRIBUTION IN FLORIDA.—A common winter resident in northern Florida; less numerous in the southern part. Specimens have been examined from Magnolia, Hibernia, Welaka, Suwannee River, Cedar Keys, and Cape Florida (March 31, 1858).

Maynard (1881, p. 146) recorded the birds as numerous near Blue Springs. Miss Catharine Mitchell noted 15 birds on Sanibel Island, February 14, 1924, and Mrs. Byrd observed a flock of 30 at Silver Palm Settlement (Princeton), December 26, 1916, and a flock of 20 at Royal Palm Hammock, October 20, 1917. Stoddard found the birds common at Wakulla Springs, February 15, 1928, and Weston reported them rare at Pensacola, where they were seen December 11, 1921, December 2, 1928, and December 15, 1929. They were said to be common at Chipley and occasional at New Smyrna (November 7, 1917; April 19, 1918). The earliest recorded date of arrival is October 17, 1919, at St. Marks, and the last seen in spring was noted at Gainesville, April 14, 1887.

HAUNTS AND HABITS.—The Rusty Blackbird occurs in winter in flocks, frequenting wet pastures, the borders of swampy woodland, cultivated fields, and even barnyards. The birds often associate with other species of blackbirds, feeding with them on the ground.

FOOD.—More than half of this bird's food consists of insects, such as beetles, grasshoppers, and caterpillars. Corn and other grain with weed seed make up the bulk of the vegetable food. Occurring in Florida only in winter, the species does little or no harm to growing crops.

BOAT-TAILED GRACKLE: *Cássidix mexicánus mâjor* (Vieillot)

OTHER NAMES: **Jackdaw; Cowbird (female); Salt-water Blackbird**

RECOGNITION MARKS.—Larger than the Florida Grackle (length of male, 15.50 to 17 inches; of female, 12 to 13.50 inches; spread of male, 21 to 23.50 inches; tail of male, 6.25 to 7.25 inches, strongly graduated and keeled). *Adult male:* Head and throat glossy violet-blue, shading on back and underparts to dark greenish blue; wings and tail fuscous-black; iris light yellow (brown in the immature male). *Adult female:* Much smaller than the male and wholly different in color; upperparts clove brown or bister; underparts buffy brown, the throat paler; wings and tail fuscous; iris brown. (Plate 54.)

RANGE.—Coast region of the South Atlantic and Gulf States from Chesapeake Bay to Florida, and west to southeastern Texas.

DISTRIBUTION IN FLORIDA.—An abundant resident throughout the greater part of the peninsula; less numerous in northwestern Florida and there restricted to the coast region; reported from most of the Keys as far south as Key West. It is especially abundant around some of the lakes of interior Florida, the breeding population at Orange Lake having been estimated at 1,500 birds. It occurs commonly on the Kissimmee Prairie, the St. Johns marshes, the prairies of Lee and Hendry Counties, the Everglades, and along all coasts. Weston records the species as very rare at Pensacola, and on our trip along the coast from that point east to Cedar Keys, we found it common only near St. Marks, small numbers being noted on St. George Island, at St. Joseph Point, Aucilla River, Rock Island, and on Pepperfish Keys.

HAUNTS AND HABITS.—Although restricted over most of its range to maritime districts, the Boat-tailed Grackle in Florida is found nearly throughout the peninsula, finding a congenial habitat around the numerous lakes and marshes. The nests are placed in bushes, weeds, or rushes growing in ponds or in clumps of saw grass or maiden cane in the marshes, 2 to 8 feet above the water; they are bulky affairs, made of saw grass, coarse weed stems, and rootlets, with an inner layer of mud and a lining of grasses. The

PLATE 54

EXPLANATION OF PLATE 54

BLACKBIRDS

The two upper figures perched on a cat-tail stem are a male (upper) and a female Florida Red-wing; beneath them, on the reeds, is a pair of Florida Grackles, female (left) and male; the two lower figures are a pair of Boat-tailed Grackles, male (left) and female; the flying birds are Bobolinks, male (upper) and female.

F.G. JAQUES

eggs, numbering 3 or 4 (rarely 2) to a clutch, are laid from about March 20 (Sanford and Kissimmee River) to the first of July (Gainesville), mainly, however, in April and May. The birds breed in loose colonies, and during most of the year travel in flocks, sometimes numbering as many as 200 individuals. They feed to a large extent along the muddy borders of ponds, sloughs, and tidal creeks, wading in the water up to their bellies, and sometimes completely immersing their heads in their search for food. In such places, I have seen them catching small fishes. On the fresh-water lakes, they walk about on the lily pads and matted vegetation, and snap up any insects within their reach. In winter the flocks visit the cabbage-palmetto trees to feed on the berries, and in the spring the birds sometimes follow the plowman to pick up grubs. In the Everglades near Royal Palm Hammock, Wetmore observed them feeding on large fresh-water snails (*Ampullaria*), which they extracted expertly without injuring the shells.

The vocal performances of these Grackles are varied and interesting, though not very musical. The "song" of one I observed sitting on a telephone pole at Jupiter in March sounded like *churr-churr; cheep-cheep-cheep*, faster and sweeter toned, then a coarse *chuck*, followed by a peculiar guttural, clattering sound that seemed to be of vocal origin, though accompanied by a fluttering of the wings.[1]

Food.—The food of this Grackle, as shown by the examination of 116 stomachs in the Biological Survey (Beal, 1900, p. 70), consists of about 40 per cent animal matter and 60 per cent vegetable matter. Crustaceans amounted to about two-fifths of the animal food in the stomachs examined, and comprised crawfishes, crabs, and shrimps. Grasshoppers are eaten in July and August, but few in other months. Beetles and various other insects are taken in small quantities. Grain, chiefly corn, constitutes 46.8 per cent of the total food, and is taken in every month of the year, and as part of this is corn "in the milk," some damage must result to this crop. Also, according to Audubon (1834, vol. 2, p. 504), the birds commit serious depredations in rice fields.

FLORIDA GRACKLE: *Quiscalus quiscula quiscula* (Linnaeus)

Other Names: **Crow Blackbird; China-eyed Blackbird**

Recognition Marks.—Larger than any of the other blackbirds except the Boat-tailed Grackle (length of male, 11 to 12 inches; of female, 9.5 to 10.5 inches; spread, 16 to 18 inches; tail, 4.5 to 5.5 inches, strongly graduated). *Adult male:* Head bluish violet, shading to purplish bronze on the nape, throat, and chest; back and underparts dark ivy green or olivaceous black; iris light yellow. *Adult female:* Similar, but colors duller. (Plate 54.)

Range.—Florida and the southern part of the Gulf States to southeastern Texas, and north to the coast region of South Carolina.

Distribution in Florida.—An abundant permanent resident over the entire State, including the Keys as far south as Key West; less numerous in winter in northwestern Florida (Pensacola and Whitfield). Specimens have been examined from Merritt Island, Punta Gorda, Kendal, Florida City, Royal Palm Hammock, and Key West.

Haunts and Habits.—The Florida Grackle inhabits a variety of situations and adapts itself to very diverse conditions. The birds are usually abundant around the towns and villages, nesting in orange groves, in pines or live oaks in dooryards, or along

[1] On this habit, see also Townsend, Auk, 1927, p. 551.

roadsides. In the wilderness, they often nest in the smaller cypress swamps, in open pine forests, palmetto hammocks, or in bushes growing in or near a pond or stream.

The nests are usually placed in trees, 8 to 20 feet above the ground, but sometimes in bushes only 2 to 7 feet above water (Ralph). They may be found in crotches of the trees or bushes, or in bunches of pendant Spanish moss, and not infrequently in hollow trees or broken-off stubs. The construction varies with the situation, but Spanish moss is used extensively for the exterior, with mud, grasses, twigs, and rootlets in the body of the nest. Ralph describes nests in which cow manure, sphagnum moss, and pine needles entered into the construction. Nesting begins sometimes early in March and continues to the first of May. At Sebring, on March 19, 1923, we examined 4 nests, all containing young, and at Orlando, on April 3, we found 7 nests in an orange grove containing fresh eggs. At Seven Oaks, April 20, 1907, Hoyt noted 7 sets of fresh eggs, and at St. Marks Pennock observed a fresh set, May 1, 1915. The clutch usually numbers 4 or 5, sometimes 3, eggs.

Florida Grackles are gregarious in habit, nesting near together in small colonies and after the breeding season gathering into large flocks, which roam about the country in search of a good food supply, visiting pastures, cultivated fields, barnyards, and the borders of ponds and sloughs. The birds roost at night in large companies in bushes in a pond, in a reedy marsh, or sometimes in willow bushes or evergreen trees. The alarm note of the Grackle is a harsh *chuck*, and the song is likewise harsh and unmusical.

Food.—The animal food of this species, as determined by Beal (1900, p. 69), amounts to nearly one-third of the total food of the year, and as most of this consists of injurious insects, it stands to the credit of the bird. Among the insects eaten are beetles, boll weevils, grubs, caterpillars, and grasshoppers. The birds are particularly fond of following a plowman and picking up from the furrows larvae of ground beetles and other insects. Crawfishes are frequently captured, and Maynard (1881, p. 150) speaks of seeing Grackles wading in the shallow margins of streams apparently in search of mollusks or crabs. He mentions, also, seeing one capture and devour a lizard, and states that flocks of Grackles in winter feed largely on the fruit of the [cabbage] palmetto. Baker (1890, p. 270), who examined specimens at Micco, found only palmetto berries in the stomachs.

The destructive habits of the Grackle include occasional attacks on green corn in the ear and on sprouting corn in the spring. Grain furnishes 46.5 per cent of the total food, a large part, however, being waste grain picked up in the fields in winter. The birds sometimes rifle the nests of smaller birds, destroying the eggs or young, but these attacks are probably not of frequent occurrence.

EASTERN COWBIRD: *Molóthrus âter âter* (Boddaert)

Other Names: **Cow Bunting; Cow Blackbird; Tick Bird**

Recognition Marks.—Smaller than the Red-winged Blackbird, with stout, sparrowlike bill, and *square tail* (length, 7 to 8 inches; spread, 12 to 13.5 inches). *Adult male:* Head, nape, and throat bister or mummy brown; rest of body greenish black, with purple iridescence on the shoulders. *Adult female:* Upperparts dark hair brown (dark drab); underparts light hair brown, the throat white.

Range.—The eastern race breeds from southern Ontario, central Quebec, New Brunswick, and Nova Scotia south to central Texas, Louisiana, Tennessee, and central Virginia. Winters from Michigan, New York, and Massachusetts south to the Gulf coast and central Mexico. Accidental in Bermuda.

PLATE 55

EXPLANATION OF PLATE 55

ORIOLES AND TANAGERS

The middle upper figures are a female (left) and a male Baltimore Oriole; below the latter are a male (left) and female Scarlet Tanager; on the branch at the left, from top to bottom, are a female Orchard Oriole, a male of the second year, and an adult male of the same species; below them are a male (left) and a female Summer Tanager.

ARQUES

DISTRIBUTION IN FLORIDA.—An irregular visitant in all parts of the State from midsummer to April, but with no record of breeding. At Daytona Beach this species was seen on September 13, 1910; August 15, 1923 (one female); and November 26, 1924 (one male). Stoddard observed a few birds in Wakulla County, July 29, 1927. At Chipley the species was noted September 22 and 28, and October 12, 1903, and February 2, 1904; at St. Marks, February 11, 1914 (flock of 100 or more), April 21, 1914, and October 15, 1919; and at Orlando, January 16, 1914, February 2 and March 22, 1917, and December 7, 1930 (flock of 250 or more). Chapman recorded it "not uncommon" at Gainesville in winter, and Scott reported it "not very common" in winter at Tarpon Springs, Punta Rassa, and Key West. Stoddard found it abundant in March in Leon County, and F. M. Uhler recorded it common in the celery fields at Sanford in February and March. H. H. Bailey (1925a, p. 96) mentions having seen it at Cape Sable, and other records are at hand from St. Lucie, Fort Drum, Seven Oaks, and Pensacola (November 21, 1920; January 15, 1922; and July 14, 1930).

HAUNTS AND HABITS.—Cowbirds are found during the greater part of the year in flocks, frequently associated with other species of blackbirds. They feed mainly in pastures or cultivated fields, often walking about among herds of cattle and sometimes alighting on the backs of the animals to search for insects. They are parasitic in their breeding habits, never constructing a nest, but laying their eggs in the nests of other birds and trusting the foster parents to care for the eggs and young.

FOOD.—Professor Beal (1900, p. 29), after examining 544 stomachs of this bird, summarized its food habits as follows:

> (1) Twenty per cent of the Cowbird's food consists of insects, which are either harmful or annoying. (2) Sixteen per cent is grain, the consumption of which may be considered a loss, though it is practically certain that half of this is waste. (3) More than 50 per cent consists of the seeds of noxious weeds, whose destruction is a positive benefit to the farmer. (4) Fruit is practically not eaten.

TANAGERS: FAMILY THRAUPIDAE

SCARLET TANAGER: *Pirânga erythrómelas* Vieillot

RECOGNITION MARKS.—About the size of the Bluebird (length, 6.5 to 7.5 inches; spread, 11 to 12 inches). *Adult male in summer:* Body scarlet-red; wings and tail black. *Adult female in summer:* Upperparts Kronberg's green (dark yellowish green); underparts lime green; wings and tail hair brown (dark drab). *Adult male in winter plumage:* Similar to the summer female, but wings black. (Plate 55.)

RANGE.—Breeds from southern Saskatchewan, southern Manitoba, central Ontario, southern Quebec, New Brunswick, and Nova Scotia south to southern Kansas, northern Arkansas, northern Alabama, northern Georgia, and upper South Carolina. Winters from Colombia to Bolivia and Peru. Migrates through Cuba, Jamaica, and Yucatan, and along the east coast of Central America.

DISTRIBUTION IN FLORIDA.—A regular spring and fall migrant in small numbers. The earliest records in spring are from the Tortugas, March 29, 1890; Princeton, March 25, 1916; and Tarpon Springs, March 28, 1928. The bulk of the migration, however, occurs in April. Bennett (1909, p. 111) reports a very large flight on the Tortugas, April 14, 1909, hundreds of birds remaining until April 20. First arrivals were recorded at Sandy Key, April 16, 1917; Sumner, April 19, 1922; Mosquito Inlet Light, April 17,

1902; Chipley, April 19, 1903; and Pensacola, April 8, 1921. Late records are from Daytona Beach, May 12, 1925; Seven Oaks, May 6, 1903, and May 10, 1902 (specimens); and Whitfield, May 13, 1903.

Earliest migrants in fall were noted at Pensacola, September 9, 1923, and September 22, 1926; De Funiak Springs, October 2, 1909; Tallahassee, October 12, 1904; Fernandina, October 8, 1906; and Sombrero Key Light, October 2, 1885. The last seen at Pensacola was on October 18, 1925, and at St. Marks, October 25, 1919. H. H. Bailey (1925a, p. 113) records one seen at Miami Beach, December 5, 1922.

HAUNTS AND HABITS.—The Scarlet Tanager is a lover of dry, deciduous woodland, and is especially partial to oak and hickory timber. It lives mainly in the upper stories of the forest and is rarely seen on or near the ground. Its song resembles that of the Robin, but has a metallic twang to it, a quality that appears also in its alarm note—*chip-ch-r-r-r.*

FOOD.—This Tanager occasionally takes a little fruit, such as cherries, strawberries, mulberries, and huckleberries, but it is mainly insectivorous and therefore decidedly beneficial. Forbush (1907, p. 213) says of it:

> As a caterpillar hunter the bird has few superiors. It is often very destructive to the gypsy moth, taking all stages but the eggs . . . . Leaf-rolling caterpillars it skillfully takes from the rolled leaves, and it also digs out the larvae of gall insects from their hiding places. Many other injurious larvae are taken. Wood-boring beetles, bark-boring beetles, and weevils form a considerable portion of its food during the months when these insects can be found. Click beetles, leaf-eating beetles, and crane-flies are greedily eaten.

SUMMER TANAGER: *Piránga rúbra rúbra* (Linnaeus)

OTHER NAME: **Summer Redbird**

RECOGNITION MARKS.—Larger than the Scarlet Tanager (length, 7.00 to 7.80 inches; spread, 11 to 12 inches), with larger bill. *Adult male:* Upperparts Pompeian red or dragon's-blood red; underparts jasper red or coral red. *Adult female:* More yellowish green than the female Scarlet Tanager; upperparts yellowish citrine (light olive); underparts olive-ocher. (Plate 55.)

RANGE.—Breeds from southeastern Nebraska, southern Iowa, southern Wisconsin, southern Ohio, Maryland, and Delaware south to Florida, the Gulf coast, and northeastern Mexico. Winters from central Mexico and Yucatan to Ecuador, Peru, and Guiana. Migrates through western Cuba. Accidental in the Bahamas.

DISTRIBUTION IN FLORIDA.—A common summer resident in the northern and central parts; rare in the southern part. It has been observed in the breeding season at Royal Palm Hammock (rare, June), Fort Lauderdale, Immokalee, Braden River, Istokpoga Lake, Seven Oaks, Homosassa, Titusville, Orange Park, Fernandina, St. Marks, St. Vincent Island, and at many other places. First migrants in spring were noted at Ritta, March 9, 1912; Punta Gorda, March 27, 1926; Orlando, March 16, 1909; Winter Park, March 2, 1919; Ormond, March 26, 1901; St. Marks, March 25, 1917; Whitfield, March 19, 1903; and Pensacola, March 25, 1917. Weston reported a heavy migration at Pensacola, April 16, 1926, and Bennett (1909, p. 111) recorded a large flight on the Tortugas, April 14, 1909, hundreds of the birds remaining until April 20. Bartsch observed single birds there, May 14, 1922, and August 19, 1925. Two birds struck Sombrero Key

Light on April 25, 1887. The last seen in fall were reported at Fernandina, October 20, 1906; St. Marks, October 19, 1919; Tallahassee, October 26, 1904; and Pensacola, October 27, 1925 (struck the light), and November 7, 1929.

HAUNTS AND HABITS.—Summer Tanagers live in open woodland, preferring the pines, but are found to some extent in oak hammocks. Their nests are placed usually on a horizontal limb of a pine or oak, 12 to 35 feet above the ground, and are very loosely constructed of weed stems and Spanish moss, and lined with fine grasses. I saw a female go to a completed nest at Lake Gentry on April 25, 1925; Pennock reported fresh eggs at St. Marks, April 28, 1918; and Nicholson found a nest at Winter Park, May 20, 1914, containing 4 fresh eggs. The alarm note of this Tanager is a sharp chippering, suggesting the syllables *tshicky-tukky-tuk*. The song is a soft, melodious warble, much like the song of the Scarlet Tanager, but lacking the metallic quality of the latter.

FOOD.—The food habits of this bird have not been thoroughly studied. Many observers have reported its habit of visiting bee hives and destroying the bees. It is known to feed also on beetles, wasps, tomato worms, and spiders, and on certain small wild fruits, such as blackberries and whortleberries. Examination in the Biological Survey of the stomachs of 6 birds taken in Alabama and of 2 taken in Florida showed that the bird has a decided preference for Hymenoptera (bees, wasps, etc.), these insects being present in 7 of the 8 stomachs in proportions varying from 30 to 98 per cent of the total contents. Other insects taken were dragon flies and click beetles.

GROSBEAKS, SPARROWS, AND BUNTINGS: FAMILY FRINGILLIDAE

FLORIDA CARDINAL: *Richmondéna cardinális floridána* (Ridgway)

OTHER NAME: **Redbird**

RECOGNITION MARKS.—Length, 7.5 to 9 inches; spread, 10 to 12 inches; *head with a prominent crest. Male:* Head and underparts deep vermilion-red; chin and a mask around base of bill black; back washed with olive-gray; tail brick red. *Female:* Upperparts pale olive-brown; underparts tawny-olive, shading to pinkish buff on lower belly; tail and crest brick red; chin deep mouse gray.

RANGE.—Peninsular Florida and west on the Gulf coast to Apalachicola. An abundant resident throughout the peninsula and on many of the Keys; recorded from Key Largo, Sandy Key, Watts Key (near Cape Sable), Big Pine, Upper Matecumbe, Boca Chica, Knight, Vacas, Grassy, Little Pine, Summerland, Cudjoe, Snipe, and Marquesas Keys. Atkins (Scott, 1889a, p. 324) says that it is rare at Key West, but common on the keys to the north of there. It is very numerous at Cape Sable, Royal Palm Hammock, Deep Lake, Caxambas, and at other places on the mainland. Specimens of this race have been examined from Jacksonville, Hibernia, Magnolia, Amelia Island, Anastasia Island, Goose Creek (Wakulla County), and Apalachicola. A Cardinal struck Sombrero Key Light, September 10, 1884—an unusual occurrence for a nonmigratory bird (Merriam, 1885b, p. 61).

HAUNTS AND HABITS.—The Florida Cardinal is found in a number of different habitats, but seems to require thickets, or at least bushes, as an essential feature of its environment. The birds often select village gardens or dooryards for their home, and they are

equally contented in the dense hammocks overgrown with cactus and lianas near Cape Sable. They follow the canals into the Everglades, and have become domiciled in the bushes growing on their banks. They are common in the deep, timbered swamps along the rivers in northwestern Florida, as well as in the custard-apple jungle on the shores of Lake Okeechobee. Even on the big prairies and in the pine woods they are usually found wherever hammock conditions, with undergrowth, occur.

The males are most delightful singers, and are often the first birds to greet the dawn. Nesting begins about the first of April and may continue to July. The nests are usually from 2 to 8 feet from the ground, placed in palmetto or oak bushes, small orange trees, or clumps of vines. The eggs usually number 3—rarely 4. A nest found in a hammock near Brooksville, May 17, 1929, was composed largely of Spanish moss, and placed 7 feet up in a small sapling; the female bird was sitting on the nest, with her wings spread widely to protect the young from falling rain.

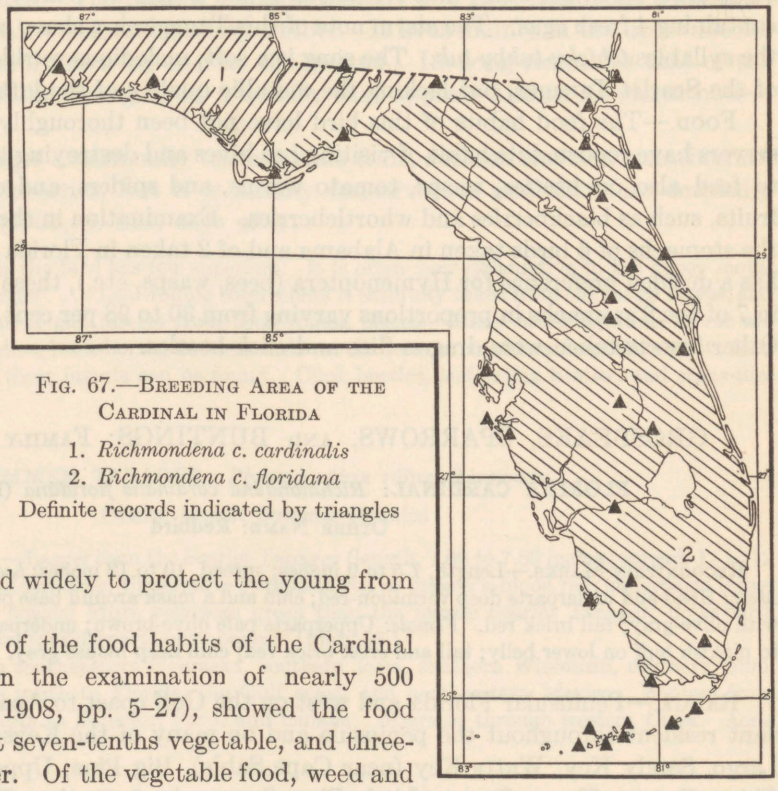

FIG. 67.—BREEDING AREA OF THE CARDINAL IN FLORIDA

1. *Richmondena c. cardinalis*
2. *Richmondena c. floridana*

Definite records indicated by triangles

FOOD.—A study of the food habits of the Cardinal (all races), based on the examination of nearly 500 stomachs (McAtee, 1908, pp. 5–27), showed the food contents to be about seven-tenths vegetable, and three-tenths animal, matter. Of the vegetable food, weed and other seeds compose the largest part—about 36 per cent; wild fruit amounts to 24 per cent, and grain nearly 9 per cent. Most of the grain eaten is corn, with some oats, wheat, sorghum, and rice. Of the seeds and berries of wild fruits, those most commonly eaten are wild grapes, dogwood berries, blackberries, raspberries, mulberries, hackberries, pokeberries, cherries, and the seeds of the spice bush, prickly pear (cactus), sumac, and poison ivy.

EASTERN CARDINAL: *Richmondéna cardinâlis cardinâlis* (Linnaeus)

RECOGNITION MARKS.—Similar to the Florida Cardinal, but slightly larger; male with underparts paler red; female averaging paler both above and below (not distinguishable from the Florida race in the field).

RANGE.—Resident in eastern North America from southeastern South Dakota, southern Iowa, northern Indiana, southern Ontario, and southern New York (Hudson Valley) south to southern Georgia and western Florida; also in Bermuda. (Figure 67.)

DISTRIBUTION IN FLORIDA.—Resident in northwestern Florida. Specimens of this race have been examined from Milton, Whitfield, Lake Iamonia, and Cherry Lake. The birds from Whitfield and eastward of that point are intermediate between *cardinalis* and *floridana*.

ROSE-BREASTED GROSBEAK: *Hedýmeles ludoviciânus* (Linnaeus)

RECOGNITION MARKS.—About the size of the Towhee, but tail shorter (length, 7.25 to 8.00 inches; spread, 12 to 13 inches; tail, 3.00 to 3.50 inches). *Adult male:* Head, throat, and back black; rump and underparts white; breast and wing linings rose (between rose doree and napal red of Ridgway); wings fuscous or black, spotted with white; outer tail feathers with white patches. *Adult female:* Upperparts light grayish olive or buffy brown, heavily streaked with fuscous and with white; underparts pale pinkish buff, breast and sides thinly streaked with hair brown (dark drab); wings and tail hair brown; wing linings light cadmium.

RANGE.—Breeds from southern Mackenzie, central Ontario, and southern Quebec south to central Kansas, Missouri, Ohio, and New Jersey, and in the mountains to northern Georgia. Winters from southern Mexico and Yucatan to northern South America. Casual in migration in Cuba, Jamaica, and the Bahamas.

DISTRIBUTION IN FLORIDA.—An uncommon migrant in spring and fall. In spring, it has been recorded at Juno, March 25, 1901; Seabreeze, April 10 and 11, 1901; Sombrero Key Light, April 25, 1887 (2); Sanibel Island, April 27, 1910 (5 seen); Tallahassee, April 14 and 16, 1897; Chipley, April 28, 1904; Whitfield, May 15, 1903; Pensacola, May 1, 1918, and May 5, 1925; and on Terra Ciea Island, May 7, 1870. Reported in fall, as follows: Pensacola, October 9, 1921, and October 19, 1929; Chipley, October 13, 1902; Tallahassee, September 6, 1896; Lake Holden, September 22, 1912; Winter Park, November 1, 1913; Sombrero Key Light, October 4 and 16, 1887, and October 9 and 11, 1888; Key West, October 11, 1888 (3 specimens); Princeton, November 10, 1917; and Royal Palm Hammock, December 24, 1917.

HAUNTS AND HABITS.—The Rose-breasted Grosbeak frequents woodlands and prefers second-growth timber that is somewhat wet or swampy. It is a shy, retiring bird, and in spite of its conspicuous markings is not often seen by the casual observer. Its call note is a thin, sharp *eek*, not loud, but quite unlike that of any other species.

FOOD.—McAtee (1908, p. 57) found this bird's food to consist of about equal parts of animal and vegetable matter. Among the pests recorded as destroyed by the bird, he mentions cucumber beetles, cankerworms, tent caterpillars, army worms, gypsy and brown-tailed moths, chinch bugs, potato bugs, the hickory borer, and the plum curculio. It is said to have a fondness for the buds and blossoms of fruit trees, and it eats some cherries, strawberries, and peas. N. B. Moore, in his manuscript notes, mentions seeing a Grosbeak on Terra Ciea Island "eating very young squashes or pumpkins."

EASTERN BLUE GROSBEAK: *Guíraca caerúlea caerúlea* (Linnaeus)

RECOGNITION MARKS.—About the size of the Bluebird (length, 6.35 to 7.50 inches; spread, 10.50 to 11.50 inches; tail, 2.75 to 3.00 inches). *Adult male:* Body smalt blue; wings and tail fuscous-black, the

wings with two bars of mikado brown (reddish brown). *Adult female:* Upperparts snuff brown or pale olive-brown, more or less shaded on the rump with light cerulean blue; underparts pinkish buff, shaded with tawny-olive on the breast; wings and tail fuscous, the wings barred with pinkish cinnamon. (Plate 56.)

RANGE.—Breeds from Missouri, southern Illinois, and Maryland south to eastern Texas, southern Alabama, and central Florida. Winters in Yucatan and Honduras. Accidental in Wisconsin, New England, and Cuba.

DISTRIBUTION IN FLORIDA.—An uncommon summer resident in the northern part; sometimes common in migration on the Keys. Bennett (1909, p. 111) recorded a large flight on the Tortugas, April 14, 1909, many birds remaining there until April 20; Bartsch took a specimen there, May 18, 1922. Other dates of spring migration are: Sandy Key, April 16, 1917; Princeton, April 25, 1917; Pass-a-Grille, April 21 to 24, 1929; Winter Park, May 5, 1914; Camp Walton, April 19, 1926; St. Joseph Point, April 30, 1926; and Pensacola, April 11, 1919, and April 13, 1924 and 1926. The last one seen in fall at Pensacola was on September 27, 1925. The species is reported breeding at Tallahassee (young in nest, June 14, 1903), Waukeenah, and Tarpon Springs (eggs, April 30, 1891). Stoddard found the birds to be fairly common summer residents in Leon County and in the adjacent parts of Georgia.

HAUNTS AND HABITS.—The Blue Grosbeak is usually found about the borders of woodland and in fields grown up to bushes and briers. The birds are of a retiring disposition and not at all conspicuous. The song is a rather weak but melodious warble, somewhat like the song of the Purple Finch, but less vigorous. The nests are placed in small trees, bushes, or blackberry briers, 2 to 7 feet from the ground. They are constructed of leaves, paper, weeds, and grass, and are lined with rootlets and hair.

FOOD.—The food of the Blue Grosbeak, as determined by McAtee (1908, pp. 78–85) from stomach examinations, is composed of two-thirds animal, and one-third vegetable, matter. Grain constitutes 14.25 per cent of the diet, but on account of the scattered distribution of the birds, no appreciable damage is done during most of the summer. Later, when the birds forage in flocks, they are said to do considerable injury. Weed seeds compose 18 per cent of the total food, thus forming the principal element in the vegetable portion of the diet. The animal food consists mainly of snails, spiders, and various insects. Among the important pests eaten are grasshoppers, weevils, the purslane sphinx, and the cotton cutworm. Crickets and short-horned grasshoppers are consumed in numbers, composing 27.2 per cent of the total food. Thirty-two of the 51 Blue Grosbeaks examined had eaten them, several taking nothing else. They are fed to the nestlings in generous measure, and without doubt constitute the most important single article of diet.

INDIGO BUNTING: *Passerina cyanea* (Linnaeus)

OTHER NAME: **Indigo Bird**

RECOGNITION MARKS.—About the size of the Chipping Sparrow (length, 5.00 to 5.25 inches; spread, 8.00 to 8.50 inches). *Adult male:* Head deep violaceous blue; back more greenish (motmot blue); underparts eton blue (dark gray-blue), more purplish on throat; wings and tail fuscous. *Adult female:* Upperparts buffy brown; underparts dull whitish, more or less washed with cinnamon-buff or dark drab. (Plate 56.)

PLATE 56

EXPLANATION OF PLATE 56

BUNTINGS AND GROSBEAKS

The upper figures are male and female Indigo Buntings; the middle figures are female and male Blue Grosbeaks; the lower figures are male and female Painted Buntings.

F. J. HAQUES.

RANGE.—Breeds from eastern North Dakota, central Minnesota, northern Michigan, southern Ontario, southern Quebec, and southern New Brunswick south to central Texas, southern Louisiana, central Alabama, central Georgia, and (casually) northern Florida. Winters from southern Mexico and Cuba to Panama (casually in Florida).

DISTRIBUTION IN FLORIDA.—An uncommon transient visitant in spring and fall; occasional in winter. Breeds casually in the northern part, and also winters casually. Chapman (1888a, p. 274) recorded one bird taken at Gainesville, January 27, 1887, and he observed a pair at Coconut Grove, January 25, 1925. Mrs. Brodhead reported four seen at Miami, March 8, 1909, which were probably wintering birds, and M. S. Crosby noted one at the same place, February 11, 1925. I saw one at Estero, March 8, 1919; H. H. Schroder recorded one seen at Lake City, March 15, 1919; F. M. Uhler observed one at Sanford, February 19, 1927; and W. H. Nicholson noted one at New Smyrna, February 9, 1931.

The principal spring migration occurs during the latter part of April. Bennett (1909, p. 111) reported an enormous flight on the Tortugas Keys the night of April 14, 1909, and on April 20 following he observed hundreds of the birds still there. Single individuals were seen at Key West, April 12, 1887, and April 24, 1914. The species was recorded at Sandy Key (near Cape Sable), April 16, 1917; Royal Palm Hammock, April 16, 1916; Egmont Key, April 19, 1910; Eau Gallie, April 20, 1910; Chipley, April 24, 1910; Warrington, April 3, 1885; Pensacola, April 13, 1916; Amelia Island, April 25 and 30, 1923; Deer Park, May 3, 1925; and Orlando, May 9, 1929. H. H. Bailey (1925a, p. 111) observed a nest with young at Gainesville, July 17, and Mrs. Byrd reported one found at Jacksonville in the spring of 1912. Weston noted a male in full song at Pensacola, June 19 and 30, 1917.

Fall migration must begin very early, for R. W. Williams (1906, p. 156) records the birds abundant during the latter part of August (first seen August 20) at Tallahassee, some remaining until October 15 (1904). Other fall records are: Pensacola, September 30, 1928, October 27, 1925, and November 3, 1926; and Chipley, October 20, 1903.

HAUNTS AND HABITS.—The Indigo Bird is a lover of bushy pastures and the brushy borders of timber tracts. The males, in spite of their bright colors, are not particularly conspicuous. They are persistent singers, even in the hot days of midsummer. The song, delivered from a perch on a tree or a telephone wire, is a hurried warble rather lacking in musical qualities. The nests are placed in bushes or briers, usually within 3 or 4 feet of the ground.

FOOD.—Forbush (1907, p. 298) states that the Indigo Bird feeds on caterpillars, grasshoppers, measuring worms, the larvæ of butterflies and moths, and small beetles. "The larger part of its food consists of seeds, many of which are those of weeds. During its short stay with us it is one of the few useful species seen much about the garden, and is of some service in the orchard."

PAINTED BUNTING: *Passerina ciris* (Linnaeus)

OTHER NAME: **Nonpareil**

RECOGNITION MARKS.—Slightly larger than the Indigo Bunting (length, 5 to 5.5 inches; spread, 8 to 8.5 inches). *Adult male in summer:* Head and nape azurite blue (dark violet-blue); fore back yellow-

green; rump dragon's-blood red; underparts scarlet. *Adult female and young male:* Upperparts oil green or bice green; underparts pyrite yellow (yellowish green), shading to amber yellow on the belly; wings and tail hair brown (dark drab), shaded with green. (Plate 56.)

RANGE.—Breeds from southern Kansas, central Arkansas, northern Mississippi, and southeastern North Carolina south to southern New Mexico, Texas, and Florida. Winters in Florida, southern Louisiana, the Bahamas, Cuba, and from central Mexico to Panama.

DISTRIBUTION IN FLORIDA.—A common migrant throughout the State. Breeds commonly in northeastern Florida, near the coast; locally and rarely on the west coast. Winters commonly in the southern part, casually in the northern part. It is reported in the breeding season at Amelia Island, Jacksonville, Mayport, Bulow, New Smyrna, Orange Park, Oak Hill, Tarpon Springs, and Punta Rassa. Wintering birds have been recorded at Orlando (four years, January and February); Winter Park, February 25, 1914; Seven Oaks, February 22, 1912; Punta Gorda, January 27, 1924; Fort Pierce, February 11, 1918; Miami (common in January and February); Coconut Grove, February 22, 1927; Princeton, February 10, 1916; Royal Palm Hammock, January 25 and February 4, 1918; and Upper Matecumbe Key.

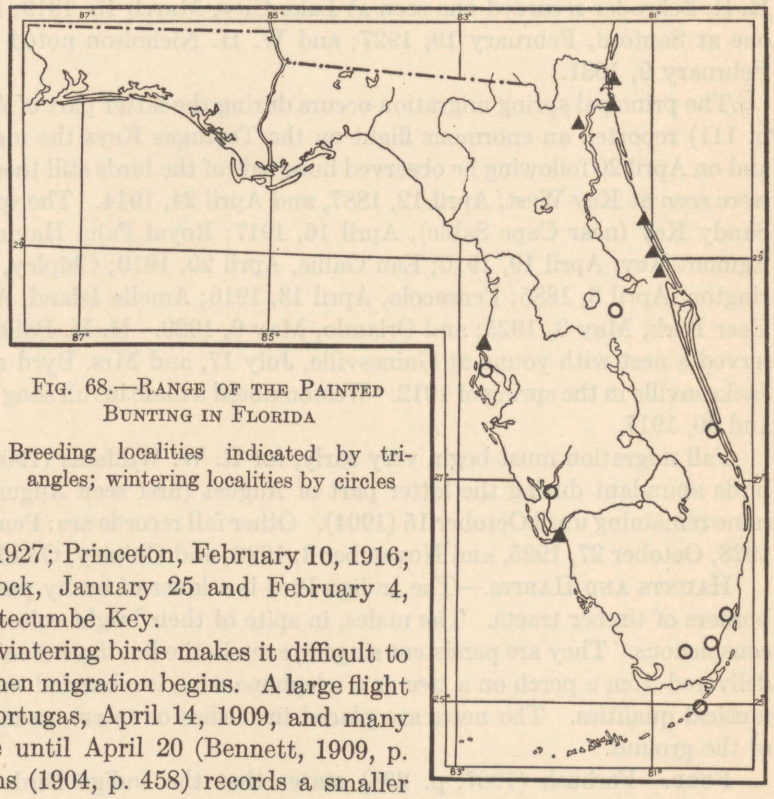

FIG. 68.—RANGE OF THE PAINTED BUNTING IN FLORIDA

Breeding localities indicated by triangles; wintering localities by circles

The presence of wintering birds makes it difficult to determine the date when migration begins. A large flight was noted on the Tortugas, April 14, 1909, and many birds remained there until April 20 (Bennett, 1909, p. 111). R. W. Williams (1904, p. 458) records a smaller flight at Tallahassee and Apalachicola, April 19 to 23, 1901. Migrants were reported at Key West, April 30, 1913; Lignum Vitae Key, April 29, 1911; Cape Florida, April 16, 26, and 28, 1858; Daytona Beach, April 12, 1924; Amelia Island, April 16, 1906; and Pensacola, April 12, 1925, and May 2, 1931. The first in fall appeared at Princeton, October 11, 1915, and October 9, 1916. The last were seen at Fernandina, October 20, 1906; Daytona Beach, October 22, 1923; New Smyrna, November 7, 1924; Fowey Rocks Light, November 20, 1887; and Sombrero Key Light, November 11, 1888.

HAUNTS AND HABITS.—The Painted Bunting lives in thickets bordering swamps or hammocks and in shrubbery on the outskirts of towns. When singing, the males seek a

PLATE 57

EXPLANATION OF PLATE 57

SPARROWS OF THE UPLANDS, AND THE PIPIT

The upper figure is a Song Sparrow; next below it is a Vesper Sparrow and below that a White-throated Sparrow; at the right is a Savannah Sparrow, and below it a Florida Grasshopper and an Eastern Grasshopper Sparrow; the lower figure is an American Pipit.

perch near the top of a small tree. "The nest is composed of weeds, skeletonized leaves, and grasses, lined with fine grass or horse hair, and is placed in low bushes, in the branches of tall trees, and often in bunches of Spanish moss, where it is completely concealed" (Wayne, 1910, p. 134). The breeding season extends from the middle of May to the middle of July. According to Wayne, three, and sometimes four, broods are raised each year. Brewster (1882a, p. 100) has described the song of the Painted Bunting as follows:

> The song is a low, pleasing warble very un-Finchlike in character. I should compare it to that of the Canada Flycatcher [Canada Warbler], but the notes are less emphatic, though equally disconnected. The bird almost invariably sings in the depths of some thicket, and the voice ceases at the slightest noise. Both sexes have a sharp chip of alarm which closely resembles that of the Indigo Finch.

FOOD.—Examination of 13 stomachs of this species from Florida indicated a preference by the bird for vegetable food, which composed 73 per cent of the total contents. Seeds of grasses, sedges, and weeds were eaten in considerable quantities, including dock (*Rumex acetosella*), *Panicum*, *Hypericum*, and *Cyperus*. Pine seeds were found in one stomach and rose seeds in another. The seeds and pulp of figs were taken in several instances, and wheat was found in two stomachs. The insect food included beetles, grasshoppers, crickets, bugs, wasps, flies, and lepidopterous larvae.

A study of the contents of 80 stomachs of these birds taken in Texas (Beal, McAtee, and Kalmbach, 1916, p. 16) was summarized by McAtee as follows:

> . . . practically all of the vegetable food of the Painted Bunting is weed seeds, two-thirds of it being the seeds of foxtail grass, one of the worst weed pests. The animal food also is composed almost exclusively of injurious species, more than a fourth of it consisting of the two greatest pests of the cotton crop—the cotton worm and the boll weevil.

GRASSQUIT: *Tiâris bicolor bicolor* (Linnaeus)

RECOGNITION MARKS.—Smaller than the Goldfinch (length, 3.85 to 4.65 inches; wing, 1.96 to 2.16 inches; tail, 1.50 to 1.70 inches); bill short, conical. *Male:* Top of head and underparts fuscous or fuscous-black; upperparts dark grayish olive. *Female:* Upperparts grayish olive; underparts light grayish olive.

RANGE.—Bahamas. Accidental in southern Florida.

DISTRIBUTION IN FLORIDA.—Known from a single accidental occurrence—a female specimen taken at Miami, January 19, 1871, by H. W. Henshaw and recorded by Maynard (1881, p. 88) under the name *Phonipara zena.*

HAUNTS AND HABITS.—The specimen collected by Henshaw was found in thick bushes in a little clearing near the old fort. Wetmore (1927, p. 553) describes the habits of the Grassquit in Porto Rico as follows:

> The grassquits are tame, unsuspicious little birds, found in pairs or in small flocks, that fly out with a quick up and down flight to alight in plain sight or under cover in bushes. As one rides through the cane fields at dusk, they continually flutter along ahead, so that the cane is full of their rustlings. Though common in the open fields, they are at home in dense second-growth forest. Here they work through the trees, searching the limbs like honey-creepers.

MELODIOUS GRASSQUIT: *Tiâris canóra* (Gmelin)

RECOGNITION MARKS.—The smallest of the sparrow family (length, 3.38 to 3.82 inches; wing, 1.77 to 1.97 inches; tail, 1.32 to 1.57 inches); bill short, conical. *Male:* Upperparts olive-citrine (dark olive);

throat and chest fuscous or fuscous-black, *with prominent bright yellow feather tufts on each side of neck.* Female similar, but *throat bay.*

RANGE.—Cuba. Accidental on the Florida Keys.

DISTRIBUTION IN FLORIDA.—Accidental; known from a single record—a bird that struck the light on Sombrero Key, April 17, 1888 (Merriam, 1888, p. 322). The wings of this bird are in the United States National Museum collection.

DICKCISSEL: *Spiza americana* (Gmelin)

OTHER NAME: **Black-throated Bunting**

RECOGNITION MARKS.—About the size of the English Sparrow (length, 5.75 to 6.50 inches; spread, 10 to 11 inches; tail, 2.50 to 2.75 inches). *Adult male in summer:* Crown yellowish green; nape and sides of head light neutral gray; a yellow line over the eye; middle of back drab, streaked with fuscous; a russet patch on the wing shoulders; *a blackish patch on the throat; breast wax yellow;* belly pale drab-gray. *Adult female in summer:* Similar to the male, but without black on the throat; head mouse gray. *Immature in winter:* Similar to the adult female, but underparts mainly buffy white, with a few fuscous streaks on the breast.

RANGE.—Breeds from northeastern Wyoming, northwestern North Dakota, northern Minnesota, and southern Ontario south to southern Texas, southern Mississippi, central Alabama, and northern Georgia (casually). Winters in Panama, Colombia, Venezuela, and Trinidad.

DISTRIBUTION IN FLORIDA.—A rare and accidental migrant. Known from the following records: Fernandina, April 22, 1881, one (Beckham, 1882, p. 250); Key West, April 30, 1889, one taken by J. W. Atkins (Scott, 1889a, p. 324); Seven Oaks, April 8, 1901, one collected by R. D. Hoyt (now in the Florida State Museum); Chipley, April 28 to 30, 1904, four birds seen by C. E. Pleas; Pensacola, April 11, 1928, one observed by F. M. Weston; and Tallahassee, April 26, 1928, one noted by Miss Ezda Deviney (Williams, 1929a, p. 122).

HAUNTS AND HABITS.—The Dickcissel is a bird of the prairies, but in timbered regions it is often found in clover fields or grassy meadows. It is not shy, and is rather conspicuous by reason of its habit of sitting on top of a weed, bush, or stake, repeating its simple song many times with much emphasis. This song has been written by Ridgway: *see, see,—dick, dick—cissel, cissel,* which rendering has given the bird its common name.

EASTERN PURPLE FINCH: *Carpodacus purpureus purpureus* (Gmelin)

RECOGNITION MARKS.—About the size of the English Sparrow (length, 5.50 to 6.35 inches; spread, 9.25 to 10.40 inches). *Adult male:* Head Pompeian red or Corinthian red; rump light jasper red; back streaked with fuscous; underparts light Corinthian red, the lower belly whitish; tail hair brown (dark drab), deeply forked. *Adult female:* Upperparts buffy brown, streaked with fuscous; underparts white, streaked on sides and breast with fuscous and pale buff.

RANGE.—Breeds from central British Columbia, northeastern Alberta, northern Ontario, central Quebec, and Newfoundland south to northern North Dakota, central Minnesota, northern Illinois, Pennsylvania (mountains), northern New Jersey, and Long Island. Winters in the Middle and Southern States south to the Gulf coast and central Florida.

DISTRIBUTION IN FLORIDA.—A rare winter visitant in the northern part. Maynard mentions seeing it once or twice at Jacksonville, and Chapman records it as "not un-

common" at Gainesville in the winter of 1887–88. Pennock found it rare at St. Marks in January and February. At Tallahassee, R. W. Williams (1914, p. 496) saw a flock of 12 birds frequently between January 14 and March 2, 1912. I noted 4 birds at Apalachicola, February 18, 1920, and Francis Harper found a flock of about 30 in a cedar grove near Fernandina, February 26, 1917. Three birds were seen at New Smyrna, February 28, 1918; three at Chipley, November 21, 1902; one at Oxford, October 13, 1920; and a flock of 30 at Orlando, February 19, 1914. A specimen was taken at Pensacola, February 3, 1928.

HAUNTS AND HABITS.—Purple Finches, while in the South, are found usually in flocks, feeding in shade trees along village streets, or sometimes on the ground. At this season they are generally silent, and so attract little attention. In their summer home, they have a spirited and melodious song.

FOOD.—During the spring migration these birds feed commonly on the buds and flowers of certain trees, such as maple, elm, apple, and cherry, but it is doubtful if such pruning ever results in appreciable damage. Many wild fruits are eaten, also, including juniper and dogwood berries, beech nuts, thorn apples, frost grapes, mulberries, and the seeds of ash, elm, sycamore, tulip, ironwood, and hemlock. The birds destroy some weed seed, such as burdock and ragweed.

NORTHERN PINE SISKIN: *Spinus pinus pinus* (Wilson)

OTHER NAMES: **Pine Linnet; Pine Finch**

RECOGNITION MARKS.—About the size of the Goldfinch (length, 4.50 to 5.25 inches; spread, 8.40 to 9.10 inches). Upperparts buffy brown, streaked with fuscous; underparts white, streaked with fuscous; wings and tail fuscous, marked with lemon yellow.

RANGE.—Breeds from central Alaska, southern Mackenzie, and central Quebec south through the mountains of western United States to northern Lower California and southern New Mexico, and to northern Minnesota, northern Michigan, New Brunswick, and Nova Scotia, and in the mountains to North Carolina. Occurs in winter over most of the United States south to northern Mexico.

DISTRIBUTION IN FLORIDA.—A rare and irregular winter visitant south as far as Miami. The records are as follows: De Funiak Springs, January 24, 1909, two seen by G. Clyde Fisher; Tallahassee, January 6, 1907, several observed by R. W. Williams (1907a, p. 159); Panama City, April 25, 1926, a flock of 15 or 20 noted by W. B. Grange and the writer; lower Suwannee River, March 26, 1890, one seen by William Brewster; Gainesville, February 15, 1890, one recorded (Brewster and Chapman, 1891, p. 137); Cedar Keys, January 14, 1906, two specimens taken by A. H. Helme; and Miami, probably in January, 1871, several observed (Maynard, 1881, p. 92), and March 4 and 18, 1909, a flock noted by Mrs. Brodhead.

HAUNTS AND HABITS.—The Pine Siskin resembles the Goldfinch in its manner of flight and method of feeding, but is less brightly colored. Its call notes and song also are said to be similar to those of the Goldfinch, but having "a peculiar husky intonation" that is characteristic (Maynard). The birds that we observed at Panama City were associated with Goldfinches, feeding from weed stalks in a dooryard in the town. They are erratic in their migratory wanderings and in their selection of a breeding place, oc-

curring sometimes in great abundance in certain localities, and then being absent for a period of years.

Food.—The Siskin feeds largely on the seeds of such trees as pine, fir, larch, juniper, birch, alder, and sweetgum; on buds of spruce and maple; and on weed seeds, including those of thistle, dandelion, ragweed, and sunflower.

EASTERN GOLDFINCH: *Spinus tristis tristis* (Linnaeus)

Other Names: Wild Canary; Thistle Bird; Lettuce Bird

Recognition Marks.—About the size of the Chipping Sparrow (length, 4.80 to 5.20 inches; spread, 8.75 to 9.25 inches). *Adult male in summer:* Body lemon yellow; top of head, wings, and tail black; wings with a white bar; tail with white patches. *Adult female in summer:* Underparts pale lemon yellow; back light brownish olive; wings and tail hair brown (dark drab). *Winter plumage* (sexes similar): Upperparts buffy brown or olive-brown; throat dull greenish yellow; underparts dull whitish, washed with drab on sides. Recognized by the undulating flight and characteristic notes.

Range.—Breeds from southern Manitoba, central Quebec, and Newfoundland south to eastern Colorado, southern Oklahoma, central Arkansas, northern Alabama, and northern Georgia. Winters over most of its breeding area, and south to the Gulf coast.

Distribution in Florida.—An irregular winter visitant in all parts of the State, sometimes common. First arrivals in autumn were recorded at Fernandina, November 15, 1906; Tallahassee, November 15, 1904; De Funiak Springs, November 15, 1909; Chipley, November 20, 1903; Orlando, November 18, 1885; Palma Sola, November 22, 1911; and Fort Pierce, December 8, 1918. The birds were reported numerous at Pass-a-Grille early in February, 1923; and small flocks were seen at Fort Myers in January and February, 1926, and at Arcadia, December 15, 1919. Maynard (1881, p. 91) noted them in large numbers at Miami in the winter of 1870–71. A few were observed by Mrs. Byrd at Princeton, December 29, 1916, and I saw three individuals in a coconut grove at Cape Sable, March 27, 1926. The last observed in spring were reported at Tarpon Springs, April 12, 1888; Daytona, April 8, 1917; Gainesville, April 14, 1887; Tallahassee, April 10, 1902; Chipley, April 5, 1903; and Pensacola, April 9, 1926.

Haunts and Habits.—During winter, spring, and early summer, Goldfinches are found in flocks, visiting fields, hedges, open groves, and shade trees along village streets. In summer, while yet in flocks, the birds often join in a merry chorus, which is both vivacious and pleasing, the songs somewhat resembling those of the tame canary. The undulatory flight of the bird is characteristic, as are its notes, uttered in flight—*per-chick'-a-ree.* R. J. Longstreet (1928e, p. 229) describes an enormous concentration of Goldfinches at Daytona Beach on December 22, 1927; from 7.40 a.m. to 12.20 p.m. the birds were flying north back of the sand dunes in flocks of 10 to 200, the total number seen being estimated at more than 14,000.

Food.—The Goldfinch subsists largely on seeds, and is so partial to the seeds of the thistle that it has earned the name of "thistle-bird." It feeds also, on a variety of weed seeds, such as ragweed, wild sunflower, and wild clematis, and in winter consumes the seeds of birch, alder, and buttonbush. The young are fed largely on plant lice, caterpillars, small grasshoppers, and beetles (Forbush, 1907, p. 222.)

RED CROSSBILL: *Lóxia curviróstra pusílla* Gloger

RECOGNITION MARKS.—About the size of the English Sparrow (length, 5.50 to 6.40 inches; spread, 10 to 10.75 inches); easily recognized by the *crossed mandibles. Adult male:* Body mahogany red, brighter on the rump, and more or less clouded with brownish; wings and tail fuscous. *Adult female:* Dull yellowish olive, brighter on the rump, clouded with hair brown (dark drab).

RANGE.—Breeds from central Alaska, northern Mackenzie, and Newfoundland south to California (Sierra Nevada and San Bernardino Mountains), southern Colorado, and Michigan, and in the Alleghenies to northern Georgia. Winters irregularly south to southern California, New Mexico, Louisiana, and Florida. Accidental in Bermuda.

DISTRIBUTION IN FLORIDA.—There are two records from northern Florida, both in the winter of 1906–7. Worthington found the birds common on Amelia Island, near Fernandina, from December 4, 1906, to January 16, 1907, in flocks numbering in some cases at least 50 individuals (Williams, 1907b, p. 220). At Sumner, on February 13, 1907, A. H. Helme collected three specimens.[1]

HAUNTS AND HABITS.—Crossbills travel mostly in flocks, and always seem restless and nervous, flying frequently from tree to tree, uttering as they go their sharp, chipping notes. They feed mainly on the seeds of evergreen trees, tearing the cones apart with their crossed bills, which are also used as aids in climbing. They are erratic in their migrations, and wandering companies of nonbreeding birds often remain south of their breeding grounds until May or June.

RED-EYED TOWHEE: *Pipilo erythrophthálmus erythrophthálmus* (Linnaeus)

OTHER NAMES: Chewink; Ground Robin

RECOGNITION MARKS.—About the size of the Cardinal (length, 7.50 to 8.75 inches; spread, 10 to 12 inches; tail, 3.30 to 4.10 inches; wing of male, 3.28 to 3.72 inches; of female, 3.00 to 3.30 inches). *Tail with large white patches* on ends of outer feathers; *iris red. Adult male:* Head, breast, upperparts, and tail brownish black; wings fuscous, with white markings; belly white; sides russet or mikado brown (reddish brown). *Adult female:* Upperparts, throat, and breast sepia or natal brown; sides as in male; wings and tail fuscous.

RANGE.—Breeds from southeastern Saskatchewan, southern Manitoba, southern Ontario, and southern Maine south to central Kansas, northern Alabama, and northern Georgia. Winters from Nebraska and the Ohio and Potomac Valleys to central Texas, the Gulf coast, and central Florida.

DISTRIBUTION IN FLORIDA.—An abundant winter resident in the northern part, less common in the central part, and rare in the southern part. It is reported abundant in northern Leon County, at Whitfield (Worthington, 1926, p. 219), Gainesville (Chapman, 1888a, p. 274), Amelia Island, New Smyrna, and Orlando. Specimens of this race have been examined from Milton (March 24), Whitfield (November 24 to March 16), Goose Creek (Wakulla County), Gainesville (April), Hibernia, Enterprise, Lake George (March 20), Lake Arbuckle, and Fort Bassenger (February 22, 1896). The red-eyed bird is recorded from Bradenton, Leesburg, Oviedo, Fort Myers (Crosby), Sebastian (F. Harper), and Princeton (one, November 17, 1917, Mrs. Byrd).

[1] These records were published in Bailey's "Birds of Florida" as being the White-winged Crossbill (*Loxia leucoptera*), which species is not known to occur in the State.

The earliest migrants of this race were observed at De Funiak Springs, October 2, 1909; Fernandina, October 19, 1906; Orlando, October 16, 1909; and Bradenton, October 19, 1924. The last seen in spring were noted at Fruitland Park, April 15, 1903; Winter Park, April 20, 1919; Melrose, April 25, 1915; and Gainesville, April 27, 1887.

HAUNTS AND HABITS.—See under the White-eyed Towhee.

WHITE-EYED TOWHEE: *Pipilo erythrophthalmus alleni* Coues

OTHER NAMES: **Joree; Brush Robin; Bull Finch**

RECOGNITION MARKS.—Similar to the Red-eyed Towhee, but smaller (wing of male, 2.90 to 3.25 inches; of female, 2.80 to 3.15 inches); *iris straw color;* white patches on tail smaller. (Plate 48.)

RANGE.—Resident in Florida and north to the coast region of southern Georgia.

DISTRIBUTION IN FLORIDA.—Resident throughout the peninsula south at least to Miami and Everglade, and west to Leon County. Breeding specimens have been examined from Boulogne, Benton, Leon County (north of Lake Iamonia), Cherry Lake (Madison County), Mayo, San Mateo, Jupiter, and Kendal. We found the species common near Immokalee in April, and at Caxambas, March 31, 1919. It was seen at Everglade, March 28, 1919, at Fort Lauderdale, June 24, 1918, and was reported common at Lake Worth in May, 1889. These records will serve to indicate the boundary of its range; it has been observed in abundance at many other places. In northwestern Florida, westward of Wakulla County, the breeding birds show intergradation with *canaster*. In winter the birds wander farther south, having been reported in small numbers at Royal Palm Hammock and at West Lake, near Cape Sable. There is a single record from Key West—a bird blown ashore in a northwest gale in February, 1889 (Scott, 1889, p. 323).

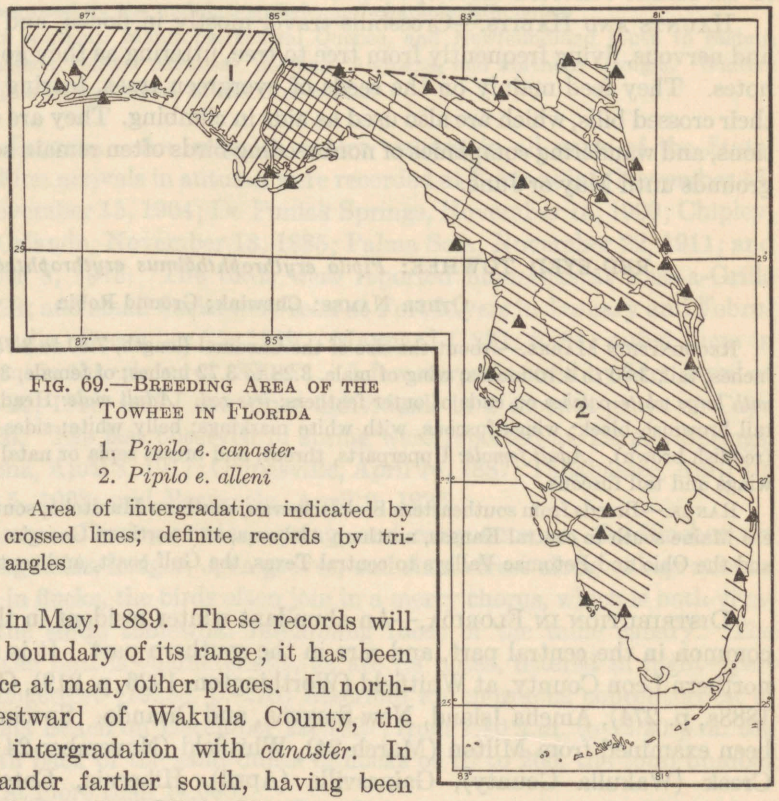

FIG. 69.—BREEDING AREA OF THE TOWHEE IN FLORIDA

1. *Pipilo e. canaster*
2. *Pipilo e. alleni*

Area of intergradation indicated by crossed lines; definite records by triangles

HAUNTS AND HABITS.—The White-eyed Towhee shows a decided preference for scrubby thickets of palmetto, oak, or yaupon. Here the birds forage mainly on the

ground, scratching with both feet among dry leaves and rubbish. They are usually shy, and when alarmed often seek shelter in the depths of a palmetto thicket, or if not much frightened they fly up to a low perch, flirting their tails as they go, and give their characteristic alarm note. This note is higher pitched than that of the Red-eyed Towhee, and consists of a single short *zree*, quite distinct from the double *che-wink* call of the northern birds. The songs of the Florida Towhees also differ from those of the northern race, some of them suggesting songs of the Song Sparrow. I have listened to some that might be rendered *cheep-cheep-cheep-chee-e-e-e*. The nests are placed in small bushes, 1 to 4 feet above the ground, or sometimes on the ground under a palmetto leaf. Three eggs are the usual complement, and two or three broods are commonly raised, the first in April, the second in June, and the third in August. Nests with eggs have been found at Seven Oaks, April 11, 1904; Sebring, April 29, 1923; Fellsmere, May 1, 1929; Daytona Beach, May 6, 1926; and Orlando, May 16, 1915, June 16, 24, and 27, 1915, and July 1, 1920. Grimes (1931a, p. 87) records a nest with newly hatched young at Jacksonville, August 12, 1930.

Food.—Examination of 77 stomachs of the Towhee (including both the white-eyed and red-eyed forms) taken in Florida showed the bird's food to comprise 32 per cent of animal matter and 68 per cent of vegetable matter. The animal matter was chiefly insect remains, with a few spiders and snails. The insects most frequently taken were caterpillars, weevils and other beetles, ants and other Hymenoptera, bugs, flies, grasshoppers, tree hoppers, and locusts. The vegetable food consisted largely of ground-up mast and wild fruits, with seeds of bayberry (*Myrica carolinensis*), blueberry, holly (*Ilex glabra*), rose, ragweed (*Ambrosia*), bindweed (*Polygonum*), poke (*Phytolacca*), and grass seed (*Panicum*). Corn was found in one stomach, and oats in another.

ALABAMA TOWHEE: *Pipilo erythrophthálmus canáster* Howell

Recognition Marks.—Similar to the White-eyed Towhee (*alleni*), but larger, with larger white markings on the tail; eyes usually red or reddish, but sometimes straw color. Compared with the northern race (*erythrophthalmus*): Bill larger; tail longer; white markings on tail smaller; females with upperparts and breast more grayish (less rufescent).

Range.—Greater part of Alabama, Georgia (except in the higher mountains), and northwestern Florida, west to southern Mississippi (Amite County), and east to the coast region of South Carolina (Georgetown, Port Royal, Christchurch Parish). (Fig. 69.)

Distribution in Florida.—Breeds in the northwestern part, east at least to Apalachicola and St. George Island. Occurs in winter in the St. Marks region. Breeding specimens have been examined from Pensacola, Mulat, Santa Rosa Island, Whitfield, Apalachicola, and St. George Island, and wintering individuals from Goose Creek (Wakulla County) and St. Marks.

During the spring of 1929, Thomas D. Burleigh, in the course of several automobile trips through central and southern Georgia, made special efforts to collect Towhees at as many localities as possible. As a result, he has brought together a considerable series of breeding specimens that has enabled us to determine the characters of *canaster* with more precision than was possible when it was first described, and to establish a range of considerable width for the subspecies. I am indebted to Mr. Burleigh for the opportunity

to study this material and to Dr. H. C. Oberholser for valued assistance in working out the characters of the race. With this abundant material, it is clear that *canaster* is a valid subspecies and not simply an intermediate form between *alleni* and *erythrophthalmus*, as contended by Worthington and Todd (1926, p. 219). The fact that in *canaster* the iris is sometimes whitish or yellowish (though usually red) may lead to some confusion; but the characters of color and size, as given above, are diagnostic.

HAUNTS AND HABITS.—Practically the same as those of the White-eyed Towhee.

EASTERN SAVANNAH SPARROW: *Passérculus sandwichénsis savánna* (Wilson)

RECOGNITION MARKS.—Nearly the size of the Song Sparrow, but with much shorter and slightly forked tail; smaller than the Vesper Sparrow and *without white in the tail* (length, 5.20 to 6.00 inches; spread, 8.00 to 9.60 inches). Upperparts hair brown (dark drab) heavily streaked with fuscous-black and moderately with buffy white; *streak over eye pale yellowish;* underparts white, streaked on breast and sides with fuscous. (Plate 57.)

RANGE.—Breeds from northern Manitoba and northern Quebec south to Iowa, northern Indiana, Pennsylvania, Connecticut, and New Jersey. Winters from southern Indiana and southern New Jersey south to the Gulf coast, Bahamas, Cuba, and northeastern Mexico.

DISTRIBUTION IN FLORIDA.—An abundant winter resident in all parts of the State. Occurs in winter at Key West (Scott, 1889a, p. 321), and sparingly on other keys in migration (Bahia Honda, April 23, 1914; Tortugas, March 20 to 30, 1890). First arrivals from the North in autumn were recorded at Pensacola, September 30, 1928; Tallahassee, October 6, 1904; Daytona Beach, October 12, 1925; Orlando, October 8, 1911; and Fort De Soto, October 7, 1914. We found the birds particularly numerous on the Kissimmee Prairie in March, on the Cape Sable prairies about the first of April, and on the prairies near Immokalee, April 9 to 16. The last seen in spring were noted at Istokpoga Lake, May 1, 1923; Deer Park, May 1, 1925; Gainesville, May 6, 1887; Daytona Beach, May 7, 1926; St. Marks, May 8, 1917, and May 10, 1919; and Pensacola, May 2, 1919.

HAUNTS AND HABITS.—Savannah Sparrows are strictly ground dwellers, and are found during the winter and spring on the prairies and in grassy fields. They run about under the vegetation like mice, only flushing when approached closely, and then usually flying but a short distance before again seeking shelter in the grass. They are usually scattered over the prairie in loose companies, and are never found in distinct flocks. During their stay in the South they are practically silent and thus very inconspicuous.

FOOD.—Examination in the Biological Survey (Judd, 1901, p. 59) of 119 stomachs of this Sparrow showed the food to consist of insects and their allies, 46 per cent, and vegetable matter (nearly all seeds), 54 per cent. Beetles constituted the most important of the insect food, having been taken at all seasons, but chiefly during the warmer months. During the winter, the birds consumed a considerable number of boll weevils. The consumption of seeds may be considered beneficial, as grass and weed seeds composed the greater part, with only a small proportion of waste wheat and oats. In cultivated fields adjoining Royal Palm State Park, in January, 1918, these little Sparrows were found to be doing some damage by nipping off young tomato plants that were about two inches high. Such damage, however, is doubtless very local and not of serious importance.

EASTERN GRASSHOPPER SPARROW: *Ammódramus savannárum australis* Maynard

OTHER NAME: Yellow-winged Sparrow

RECOGNITION MARKS.—Smaller than the Savannah Sparrow (length, 4.80 to 5.25 inches; spread, 8.00 to 8.50 inches). Underparts white, *without streaks*, the breast and sides rather heavily washed with pinkish buff or cinnamon-buff; upperparts mixed fuscous-black and russet, the feathers edged with smoke gray and light buff; crown with a median stripe of pinkish buff; *bend of wing bright yellow*. (Plate 57.)

RANGE.—Breeds from southern Wisconsin, southern Ontario, and southern New Hampshire south to southern Louisiana, central Alabama, northern Georgia, and northern South Carolina. Winters from southern Illinois and North Carolina south to the Bahamas, Cuba, Yucatan, and the Gulf coast of Mexico.

DISTRIBUTION IN FLORIDA.—A common migrant and uncommon winter resident over most of the State. First arrivals in autumn were reported at Tallahassee, October 16, 1904; Fernandina, October 29, 1906; St Vincent Island, November 6, 1910; and Princeton, November 4, 1915. Migration evidently continues through November into December, as shown by the records of birds striking the lighthouse on Sombrero Key, November 4, 10, and 11, 1888, and December 5 and 17, 1887. On November 4, 1888, 150 birds struck the light, 31 of which were killed, and on November 11, 20 birds struck the light and 3 were killed. The species was recorded as common at Tarpon Springs, Punta Rassa, and Key West from October to April (Scott, 1889a, p. 321), and Ballantine found it common throughout the winter at Orlando. It has also been reported in winter at Lake Wimico, Palatka, Kissimmee, Eau Gallie, Fort Bassenger, Miami, Royal Palm Hammock, and Boca Grande Key (January 6, 1919). Spring migrants were noted on the Tortugas, April 7, 1890, and May 17 and 19, 1922; Fowey Rocks Light, April 15, 1902; Sombrero Key, May 12, 1888; Sandy Key, May 12, 1919; Whitfield, March 17, 1903; Chipley, March 19, 1904; Tallahassee, April 27, 1902; and Port Orange, May 3, 1925.

This subspecies probably breeds locally in Florida. Baynard (1913a, p. 246) records a pair of the birds with young that could barely fly on Paines Prairie, Alachua County, late in June. Mrs. Hiram Byrd several times observed a Grasshopper Sparrow near Erie with food in its bill; one individual was seen in that vicinity on June 12, 1924. In the absence of specimens it is not possible to say to which race these records belong, but the environment in which the birds were found indicates the probability that they were of the northern race (*australis*). The Florida form (*floridanus*) is not known to occur north of the Kissimmee Prairie, where it lives in a very different habitat (see p. 452).

HAUNTS AND HABITS.—The Grasshopper Sparrow, so named from the resemblance of its song to the stridulations of that insect, is a dweller in upland grass fields. The birds are very inconspicuous, remaining concealed in thick grass most of the time, and rarely seeking a perch higher than a weed stalk or fence post. They are so gentle and unsuspicious that they may usually be approached very closely.

FOOD.—This little Sparrow is mainly insectivorous and strictly beneficial. True to its name, it specializes on grasshoppers, these insects forming nearly one-fourth of its food. Caterpillars constituted 14 per cent of the total food, more than half of which were cutworms (Judd, 1901, p. 63).

FLORIDA GRASSHOPPER SPARROW: *Ammódramus savannárum floridánus* (Mearns)

RECOGNITION MARKS.—Similar to the northern race (*australis*), but bill larger. *Upperparts mainly black* (in breeding plumage), edged with grayish, but with little or no brown; underparts less heavily washed with pinkish buff. (Plate 57.)

RANGE.—Described by Doctor Mearns in 1902 from a pair taken on the Kissimmee Prairie, 7 miles east of Alligator Bluff, this bird eluded the efforts of collectors to obtain additional specimens until the spring of 1929, when I located a small colony on the prairie, about 8 miles southwest of Kenansville, and collected a series of 9 adults and 1 young bird. It proves to be a strongly marked race, with a large bill, much darker colored (more blackish) above and paler (less buffy) below than the northern race.[1] We examined a large area of the prairie both north and south of Alligator Bluff without finding any additional birds. Charles E. Doe reported them numerous about 15 miles northwest of Bassenger. Oscar Baynard found two nests of this species on the Hicpochee Prairie, south of Lake Hicpochee, and D. J. Nicholson saw a number of Grasshopper Sparrows, presumably of this subspecies, on the prairies southeast of Immokalee, where they appeared to be breeding.

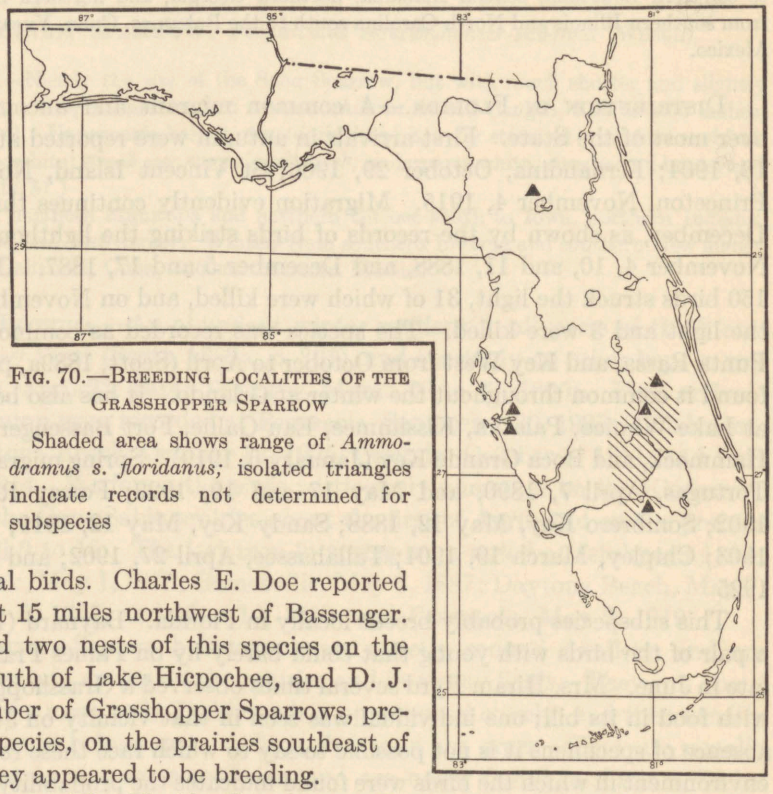

FIG. 70.—BREEDING LOCALITIES OF THE GRASSHOPPER SPARROW

Shaded area shows range of *Ammodramus s. floridanus;* isolated triangles indicate records not determined for subspecies

HAUNTS AND HABITS.—The Florida Grasshopper Sparrow, as observed on the Kissimmee Prairie near Kenansville, lives among the stunted growth of saw palmetto and dwarf oaks (*Quercus minima*) a foot or two high, seemingly preferring this habitat to the grassy areas. We found the birds in a scattered colony, numbering perhaps 30 individuals, in an area about half a mile in length. They were rather shy, flushing about 10 or 15 feet in front of us and flying often a hundred yards or more before alighting on the ground and running out of sight in the brush. In the forenoon a few were heard singing from low bushes a weak little song that could scarcely be heard 50 feet away. It resembled the song of the northern Grasshopper Sparrow, but seemed weaker. Nicholson

[1] Measurements in millimeters of 9 adult males (including the type) are as follows: Wing, 60.6 (59.5–62.5); tail, 42.9 (40.5–45); exposed culmen, 12.2 (12–13); depth of bill at base, 8.7 (8–9.5).

phrased it as *tik-tik-tok-buzz-z-z*. A frail nest, not completed, was found on May 11, on the ground under a dead palmetto leaf. Mearns noted young on the wing on April 21. A nest observed by C. E. Doe near Bassenger on April 2, 1927, containing 4 slightly incubated eggs, was situated on the ground at the edge of a small tussock of grass on open prairie; it was constructed of fine grasses, and concealed by grass growing over it.

FOOD.—Examination of the stomachs of 10 specimens taken on the Kissimmee Prairie showed the bird's food to consist of animal matter (insects and spiders), 69 per cent, and vegetable matter, 31 per cent. The insects taken in greatest quantity were grasshoppers and crickets, beetles and weevils, and moths and their larvae, with a few flies and bugs. Seeds of sedges composed most of the vegetable food, with some grass seed and seeds of star grass (*Hypoxis*).

LECONTE'S SPARROW: *Passerhérbulus caudacútus* (Latham)

RECOGNITION MARKS.—Smaller than the Grasshopper Sparrow, with smaller bill (length, 4.90 to 5.10 inches; spread, 6.90 to 7.10 inches); tail strongly graduated, the feathers narrow and pointed. Upperparts fuscous-black, varied with light buff; a buffy white median stripe on the crown; line over the eye cinnamon-buff; *nape mikado brown* (reddish brown), edged with grayish; breast pinkish buff; belly white; sides moderately streaked with fuscous.

RANGE.—Breeds from Great Slave Lake, Mackenzie, southern Saskatchewan, and Manitoba south to North Dakota and southern Minnesota. Winters from southern Kansas and southern Missouri to Texas, Florida, and South Carolina.

DISTRIBUTION IN FLORIDA.—A winter resident, chiefly on the west coast; apparently rare in most sections, though perhaps locally common. Maynard found it common at Rosewood, Levy County, in November, 1881, the first bird being taken on November 4. In 1883, at the same locality, he collected additional specimens between November 20 and December 20, a total of 11 being taken in the two seasons. Wayne (1895, p. 365) records the species at Waukeenah without comment as to its abundance. It has been observed at East Goose Creek, December 30, 1921 (Crosby); Orlando, January 24, 1911, and February 9, 1917 (Ballantine); Seven Oaks (Hoyt); Manatee County, April 26 and May 3, 1925 (Mrs. Byrd); and Cape Sable, February 13, 1918 (specimen).

HAUNTS AND HABITS.—Leconte's Sparrows are probably the most elusive of the small sparrows, living in old fields under cover of dense, matted grass and weeds, from which they are flushed only with difficulty. Maynard is apparently the only collector who has found them common in Florida. His notes, made at Rosewood and published by Brewster (1882b, p. 121), are as follows:

> The first *C. lecontei* was shot November 4. Shortly afterwards they became so abundant that as many as twenty were sometimes seen in a day, but notwithstanding their numbers, it was by no means easy to obtain specimens. The chief difficulty arose from their excessive tameness, for they could rarely be forced to take wing, while in the long grass it was impossible to see them at a greater distance than a few yards. Indeed so fearless were they that on several occasions Mr. Maynard nearly caught them in his insect net.

The bird that I collected at Cape Sable was taken in short grass on the coastal prairie.

WESTERN HENSLOW'S SPARROW: *Passerhérbulus hénslowi hénslowi* (Audubon)

RECOGNITION MARKS.—About the size of the Grasshopper Sparrow (length, 4.75 to 5.25 inches; spread, 7 to 7.50 inches). Crown black, with a median line of buffy brown; *sides of head and nape dark olive-buff*, spotted with black; feathers of back fuscous-black, edged with mikado brown (reddish brown) and buffy white; rump buffy brown; underparts white, the breast faintly washed with buff and streaked with fuscous-black.

RANGE.—Breeds west of the Alleghenies from South Dakota and Ontario south to northern Texas and Ohio. Winters in southeastern Texas and east to Florida.

DISTRIBUTION IN FLORIDA.—A winter resident in the northern and central parts, occurring with the eastern race. Specimens have been examined from the following localities: Whitfield (5 specimens, December, January, and February); Rosewood (6 specimens, November and December); Bassenger (February 28, 1907); Eau Gallie (January 11, 1910); and Pensacola (December 6, 1925, and November 28, 1926). G. Clyde Fisher (1910b, p. 46) reported the species common at Lake Wimico, December 25 to 31, 1909. First arrivals from the North in autumn were noted at Pensacola, November 5, 1916. The last seen in spring were recorded at Clearwater, March 25, 1880; De Funiak Springs, March 18, 1909; and Tarpon Springs, April 11.

HAUNTS AND HABITS.—Henslow's Sparrow is found in winter chiefly in broomsedge fields and in grassy spots in open pine woods. It is strictly a ground dweller, preferring dense, matted grass for its covert, in which it hides with great persistence. When flushed it flies but a short distance before again alighting and running to shelter.

EASTERN HENSLOW'S SPARROW: *Passerhérbulus hénslowi súsurrans* Brewster

RECOGNITION MARKS.—Very similar to the typical race (*henslowi*), but with distinctly heavier bill.

RANGE.—Breeds east of the Alleghenies from central New York and southern New Hampshire south to northern Virginia. Winters in Florida and the southern part of the Gulf States.

DISTRIBUTION IN FLORIDA.—A winter resident in northern and central Florida. Specimens have been examined from localities as follows: Whitfield, December 9, 1902; Lake Ashby, March 18, 1901; Enterprise, February 4, 1889; Rosewood, November 20, 1883; and Eau Gallie, January 19, 1910.

FOOD.—The food habits of this Sparrow are not well known; four stomachs of birds from Virginia examined by Judd (1901, p. 63) contained beetles, cutworms, grasshoppers, bugs, and blackberries.

EASTERN SHARP-TAILED SPARROW: *Ammospíza caudacúta caudacúta* (Gmelin)

RECOGNITION MARKS.—About the size of the Savannah Sparrow (length, 5.00 to 5.75 inches; spread, 7.00 to 8.25 inches); bill slender; *tail graduated, the feathers narrow and pointed.* Top of head brownish, with a median line of dark gray; cheeks deep mouse gray, bordered above and below with cinnamon-buff; upperparts dark grayish olive, tinged with brown, the middle of the back narrowly lined with white; bend of wing pale yellow; underparts white; the breast and sides streaked with fuscous. (Plate 58.)

RANGE.—Breeds in salt marshes on the Atlantic coast from Massachusetts to Virginia. Winters from New Jersey to Florida.

DISTRIBUTION IN FLORIDA.—A common winter resident in the northern and central parts; rare south of Tampa Bay and Mosquito Inlet. Maynard (1881, p. 125) speaks of this species as "common in the marshy country just north of the [mouth of] St. Johns River" and this is confirmed by Worthington, who collected many specimens on Amelia Island in 1906 and 1916. Scott (1889a, p. 322) records the bird as a common migrant and winter resident in the neighborhood of Tarpon Springs, and there are 10 specimens from that locality in the Museum of Comparative Zoölogy. Specimens have been examined, also, from Goose Creek (Wakulla County), Cedar Keys, Aucilla River (mouth), Grassy Island (Taylor County), Seven Oaks (Old Tampa Bay), Pass-a-Grille, Indian Rocks (Pinellas County), Oak Lodge (opposite Micco), and Cape Sable (2, March 1, 1921, L. C. Sanford). The earliest dates of arrival in fall are October 20, 1901, and October 21, 1913, at Seven Oaks. The latest dates in spring on which the species was noted are March 25, 1925, at Indian Rocks; April 5, 1905, at Grassy Island; and May 3, 1926, at St. Vincent Island (specimen).

HAUNTS AND HABITS.—The Sharp-tailed Sparrow inhabits the salt marshes on the Atlantic and Gulf coasts, living mainly in the drier portions, among dense and matted growths of *Spartina* and other marsh grasses. The birds are very loath to leave the cover of the marsh, and unless startled or pressed too hard, will escape by running and hiding in the thick vegetation. While in their winter resorts they are practically silent, and even on their breeding grounds their song is weak and of short duration.

ACADIAN SHARP-TAILED SPARROW: *Ammospiza caudacuta subvirgata* (Dwight)

RECOGNITION MARKS.—Similar to the typical race (*caudacuta*), but dark streaks less pronounced; breast conspicuously washed with pinkish buff; breast and sides faintly streaked with hair brown (dark drab); upperparts mainly deep grayish olive, unstreaked or faintly marked with dull white and brownish olive.

RANGE.—Breeds in salt marshes on the Atlantic coast from southeastern Quebec, Prince Edward Island, and Cape Breton Island to Maine. Winters on the coasts of South Carolina, Georgia, and Florida.

DISTRIBUTION IN FLORIDA.—A winter resident on the northeast coast marshes. Recorded by Worthington as common on Amelia Island from November 16, 1905, to February 24, 1906 (Cooke, 1908c, p. 319); also from January 31 to March 20, 1916, and March 12 to May 8, 1918. Numerous specimens were collected on these dates, which are now in the Dwight and Sanford collections in the American Museum of Natural History. One specimen was taken, also, by Worthington, at New Berlin, December 9, 1919.

NELSON'S SHARP-TAILED SPARROW: *Ammospiza caudacuta nelsoni* (Allen)

RECOGNITION MARKS.—Similar to the eastern subspecies, but upperparts rather heavily marked with fuscous and broadly edged with white; *breast and sides of head and neck washed with cinnamon-buff or clay color;* streaking on breast much reduced or obsolete. (Plate 58.)

RANGE.—Breeds from Great Slave Lake and west central Alberta southeastward to Manitoba, northeastern South Dakota, and southern Ontario. Winters on the Atlantic and Gulf coasts from North Carolina to Florida and Texas; northward on the Atlantic coast during migration to New York, Massachusetts, and Maine.

DISTRIBUTION IN FLORIDA.—A moderately common winter resident in the northern part, south at least to Merritt Island and Tampa Bay. Worthington found the birds in some numbers on Amelia Island and collected specimens there December 15, 1905, January 13, and May 11, 1906, and in February and March, 1916; also at Titusville, March 4, 1905; Wilson, January 26, 1921; and New Berlin, November 28, 1919. Specimens were taken by Pennock at St. Marks, January 27 and February 10, 1915; by Helme at Cedar Keys, January 4, 17, and 19, and December 27, 1908; by Fargo at Indian Rocks, Pinellas County, March 4 and 25, 1925; and by F. M. Weston at Pensacola, October 7, 1928. We found the birds fairly numerous at Goose Creek, Wakulla County, in January, 1920, taking two specimens; one was taken there, also, on November 21, 1917. The earliest date of arrival recorded on Amelia Island is October 17, 1906, and the latest date of occurrence there in spring, May 11, 1906. At Rock Island, Taylor County, I collected a specimen May 24, 1926—the latest spring record. At Cape Sable, March 29, 1926, I had a good view of a bird believed to be of this subspecies, but it was not obtained. Grange took a specimen on St. Vincent Island, May 3, 1926.

HAUNTS AND HABITS.—Nelson's Sparrow, although breeding in fresh-water marshes in the interior, is found in winter chiefly in the salt marshes of the Atlantic and Gulf coasts, where it associates with its near relatives, the Eastern and Acadian Sharp-tailed Sparrows.

BISHOP'S SHARP-TAILED SPARROW: *Ammospiza caudacuta divĕrsa* (Bishop)[1]

RANGE.—Breeds on the Atlantic coast marshes from North Carolina to Maryland. Winters south to Florida.

DISTRIBUTION IN FLORIDA.—Bishop (1901, p. 270) records two specimens from Tarpon Springs taken in "early spring." In the Biological Survey collection there are three specimens, two from Goose Creek, Wakulla County, taken January 9 and 13, 1920, and one from Cape Sable, February 19, 1918. There are also three specimens in the Carnegie Museum, two from Amelia Island, February 14 and 22, 1906, and one from Nassau County, January 21, 1916.

Material gathered since this race was described, and examined by Dr. H. C. Oberholser and the writer, confirms the opinion of the describer that this is a well-marked form, distinguished from *caudacuta* by its darker back, and from *nelsoni* by heavier streaking on the breast.[2]

NORTHERN SEASIDE SPARROW: *Ammospiza maritima maritima* (Wilson)

RECOGNITION MARKS.—Slightly larger than the Sharp-tailed Sparrow (length, 5.75 to 6.25 inches; spread, 8.15 to 8.50 inches), with larger bill and darker colors; tail feathers narrow and pointed. *Adult in fresh winter plumage:* Upperparts grayish olive, the middle of the back shaded with fuscous and with grayish edgings to the feathers; stripe in front of eye and bend of wing wax yellow, underparts grayish white, indistinctly streaked or clouded with neutral gray and light buff; tail hair brown (dark drab), shaded with grayish olive.

RANGE.—Breeds in salt marshes of the Atlantic coast from southern Massachusetts to southern Virginia. Winters from Virginia to Georgia and extreme northeastern Florida.

[1] For original description, see Auk, vol. 18, p. 269, July, 1901.

[2] A more detailed description is given by Oberholser (Auk, 1931, p. 610).

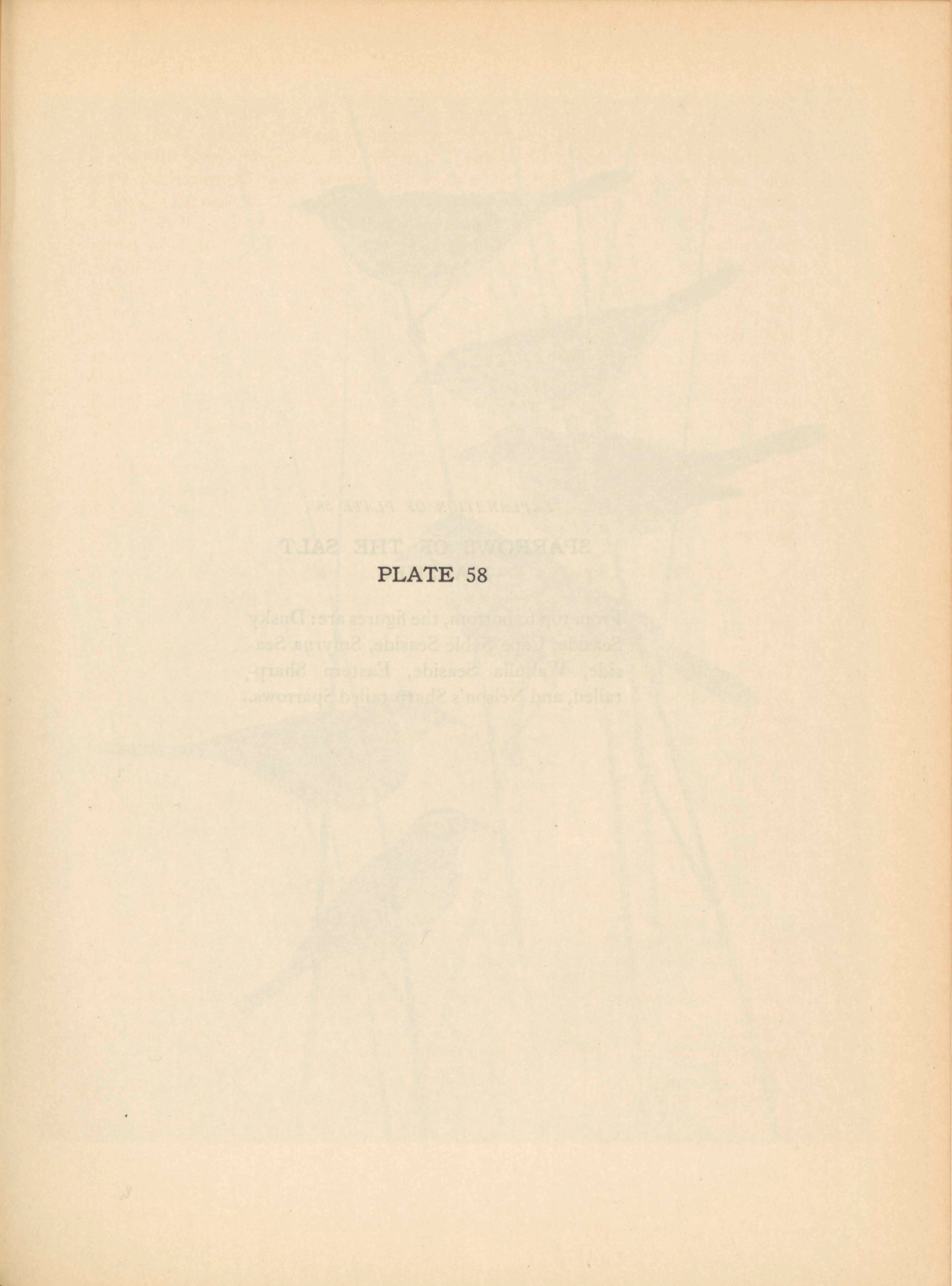

PLATE 58

EXPLANATION OF PLATE 58

SPARROWS OF THE SALT MARSHES

From top to bottom, the figures are: Dusky Seaside, Cape Sable Seaside, Smyrna Seaside, Wakulla Seaside, Eastern Sharp-tailed, and Nelson's Sharp-tailed Sparrows.

F. J. Jaques.

DISTRIBUTION IN FLORIDA.—A common winter resident on Amelia Island, where Worthington collected numerous specimens between October 18 and March 24 (now in the Dwight collection in the American Museum of Natural History). A specimen taken by Helme at Grassy Island, Taylor County, April 5, 1905, is the only one examined from the west coast—probably a wanderer.

HAUNTS AND HABITS.—During its stay in Florida this race of the Seaside Sparrow lives in the salt marshes on the coast, which are inhabited also by the local race, *pelonota*.

MACGILLIVRAY'S SEASIDE SPARROW: *Ammospiza maritima macgillivraii* (Audubon)

RECOGNITION MARKS.—Similar to the typical race (*maritima*), but upperparts darker and sometimes heavily streaked with blackish; streaks on breast and flanks broader and darker; shaft streaks on the middle tail feathers much broader.[1]

RANGE.—Breeds in salt marshes from the coast of North Carolina south to the South Edisto River, South Carolina. Winters south to northern Florida.

DISTRIBUTION IN FLORIDA.—Winters commonly, with other races of the same species, in the marshes on Amelia Island; specimens have been examined from there, taken January 11, February 22, and September 2 and 13, 1906. Three specimens from the west coast, taken by A. H. Helme at Cedar Keys, February 7, 1905, and January 31, 1907, and in Taylor County, November, 1906, have been examined.

WAYNE'S SEASIDE SPARROW: *Ammospiza maritima wâynei* (Oberholser)[2]

RECOGNITION MARKS.—Similar to *macgillivraii*, but smaller (wing, 2.23 to 2.50 inches; tail, 2.03 to 2.40 inches), and lighter above; similar also to *maritima*, but smaller, and somewhat darker above (Oberholser, *loc. cit.*).

RANGE.—Breeds in salt marshes on the coast of Georgia. Winters south to northeastern Florida.

DISTRIBUTION IN FLORIDA.—Apparently winters not uncommonly, with other races of the same species, in the marshes of extreme northeastern Florida. Known at present from four specimens, as follows: Amelia Island (3), November 29, 1903, and March 13 and October 18, 1906; Nassau County, February 7.

SMYRNA SEASIDE SPARROW: *Ammospiza maritima pelonôta* (Oberholser)[2]

RECOGNITION MARKS.—Similar to *macgillivraii*, but smaller (wing, 2.22 to 2.48 inches; tail, 2.08 to 2.26 inches), and without broad shaft stripes on the middle tail feathers. (Plate 58.)

RANGE.—Resident in local colonies on the northeastern coast of Florida, from Amelia Island to New Smyrna. (Fig. 71.) Breeding specimens were collected at Fernandina, Matanzas Inlet, Ponce Park, and New Smyrna. Search was made for these birds in the marshes of Mosquito Lagoon in May, 1925, but none was found there; apparently there are no breeding colonies of Seaside Sparrows south of New Smyrna, except on Merritt Island, where the Dusky Seaside occurs.

HAUNTS AND HABITS.—This race of the Seaside Sparrow inhabits the open salt marshes, covered with a dense growth, usually about knee high, of *Salicornia* and small

[1] Cf. Oberholser, Proc. Biol. Soc. Washington, vol. 44, p. 125, October 17, 1931.

[2] For original description, see Proc. Biol. Soc. Washington, vol. 44, pp. 123-127, October 17, 1931.

flags. The nests are placed in the top of this tangled vegetation, well concealed from view and about 10 to 24 inches above the ground, or less frequently in one of the small mangrove bushes that dot the marsh. The nests are constructed of the dead stems of marsh grasses. The eggs, numbering 3 or 4 to a set, are laid about the middle of April. Six nests with fresh eggs were found at New Smyrna, April 20, 1925, by D. J. Nicholson, and I collected a fresh set at the same locality, May 23, 1925.

The birds are shy, and during the breeding season remain concealed in the dense vegetation of the marsh a good part of the time, and may be heard chirping in these retreats. Every little while one will fly to a small mangrove bush or a weed stalk and deliver his short, weak song, which suggests a faint, distant song of the Red-wing. It consists of a sharp, double note, followed by a weak, buzzing trill. Occasionally a bird indulges in a more prolonged and varied flight song. When flushed, the birds frequently fly for 50 yards or more before alighting. In a marsh on Amelia Island, I found these Sparrows numerous and comparatively tame. Here they were nesting in a somewhat dryer situation (which, however, was subject to tidal overflow) in a low growth of *Spartina*.

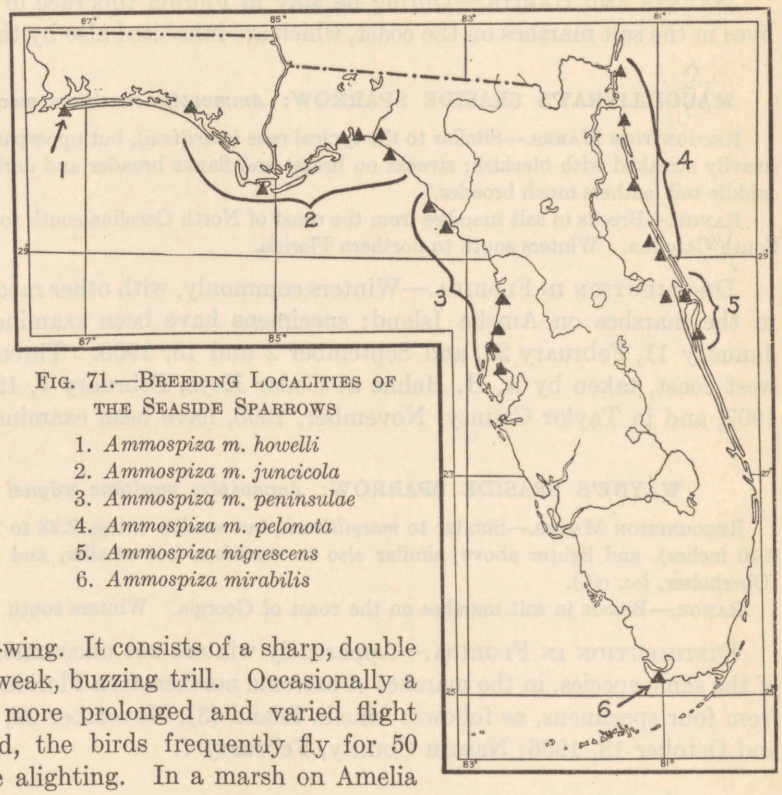

FIG. 71.—BREEDING LOCALITIES OF THE SEASIDE SPARROWS

1. *Ammospiza m. howelli*
2. *Ammospiza m. juncicola*
3. *Ammospiza m. peninsulae*
4. *Ammospiza m. pelonota*
5. *Ammospiza nigrescens*
6. *Ammospiza mirabilis*

FOOD.—Examination of 13 stomachs of birds of this subspecies taken on the east coast of Florida showed the bird's food to consist wholly of animal matter—small crabs, amphipods, marine worms, dragon flies, grasshoppers, beetles, bugs, moths, Hymenoptera, and spiders.

SCOTT'S SEASIDE SPARROW: *Ammospiza maritima peninsulae* (Allen)

RECOGNITION MARKS.—Similar to the typical race (*maritima*), but upperparts darker and more overlaid with Prout's brown (dark cinnamon-brown) or mummy brown. (Plate 58.)

RANGE.—Resident on the west coast of Florida from Indian Pass and Old Tampa Bay north to Pepperfish Keys, intergrading in southern Taylor County with *juncicola*.

(Fig. 71.) A large series of both breeding and wintering specimens has been examined from various points on this coast. Breeding birds were taken on Pepperfish Keys, at Suwannee River (mouth), Cedar Keys, Chassahowitzka River, Port Richey, and Tarpon Springs. A few typical specimens of this race have been taken in winter in the range of *juncicola*—at Fenholloway River, March 23, 1905, and Pinhook Creek, Jefferson County, March 13, 1906.

HAUNTS AND HABITS.—Scott's Seaside Sparrow inhabits the extensive salt marshes of the west coast, which are largely covered with a very dense growth of needle-pointed rushes (*Juncus roemerianus*). In this tangle of vegetation the birds are safe from most of their enemies, including man. At the mouth of the Suwannee River, on a cold, windy day in January, the birds stuck very closely to the dense, matted marsh grass, and it took me an hour and a half to flush three or four individuals, only one of which was collected. During the breeding season, however, the males give frequent vent to their springtime exuberance by ascending to the tops of the tallest rushes and rendering their curious little song, then perhaps making a short flight before dropping into the cover of the marsh. The song, though not loud, has considerable carrying power. Heard at close range it begins with a faint click in the throat, then a low throaty tone, followed by the song proper, which is of about two seconds' duration, and consists of two, or sometimes three, notes slurred into one, ending in a trill, this suggesting the finishing note of a Red-wing's song.

At Port Richey, where we found the birds breeding abundantly, we collected well-grown young on May 28, but failed to find any nests. At Elfers, June 2, 1929, Nicholson observed two nests, 6 and 14 feet above the ground in mangrove trees. On that date the birds had hatched their first broods and only broken egg shells were found in the nests. At the same locality, on May 31, 1931, Oscar Baynard found a nest with 4 fresh eggs, 2½ feet up in a tuft of "needle-grass" (*Juncus*), and on June 2 and 11, several more nests were found in similar situations.

FOOD.—Five stomachs of birds of this race, examined in the Biological Survey, indicated food preferences similar to those of the east-coast birds; spiders, grasshoppers, and beetles formed the bulk of the contents, with some small bivalves and gastropods.

WAKULLA SEASIDE SPARROW: *Ammospiza maritima juncicola* (Griscom and Nichols)

RECOGNITION MARKS.—Slightly larger and much darker than *peninsulae*, the upperparts mainly fuscous-black, varied with dark olive on the nape and rump; underparts darker and more blackish. (Plate 58.)

RANGE.—Resident on the Gulf coast of Florida from St. Andrews Bay to southern Taylor County (Rock Island); a few individuals wander in winter as far south as Cedar Keys (specimens, February 4, 1909, and April 10, 1905, collection of A. H. Helme), and one bird from Amelia Island (December 19, 1905, Dwight collection) seems clearly referable to this race. The birds are very abundant as far west as Wakulla County, and fairly common on the bay side of St. Vincent Island. In St. Andrews Bay we found but two individuals, both singing males, on April 27, 1926. (Fig. 71.)

HAUNTS AND HABITS.—This race is very similar in its habits to Scott's Seaside, and inhabits the same type of marsh, one in which there is a very heavy growth of *Juncus*.

In some places, as on St. Vincent Island, the birds were shy and difficult to approach, while in other places, as at St. Marks Light and Rock Island, they were less suspicious. At Rock Island they were found in the low growth of *Salicornia* as well as in the tall rushes. At Goose Creek, Wakulla County, in January, the birds were very numerous in the heavy stands of *Juncus*, and on sunny days they gave utterance to numerous little squeaky, chippering songs. Even at that date, a squeaking noise made on the back of the hand would often bring a bird out of the cover, to fly rapidly toward the sound and alight on top of the rushes. A nest noted near St. Marks lighthouse, May 18, 1926, was placed in a thinly grassed area of marsh, 22 inches above the ground in a small clump of rushes, and contained three naked young and one egg.

Food.—The stomachs of six birds of this race examined contained practically the same items in the food as were found in the food of the other subspecies; small crabs, however, were taken in greater quantities, amounting in some cases to more than half of the total food contents.

HOWELL'S SEASIDE SPARROW: *Ammospiza maritima howelli* (Griscom and Nichols)

Recognition Marks.—Similar to *peninsulae*, but upperparts more extensively brownish (cinnamon-brown on head and neck, mummy brown on the back); breast in fresh plumage suffused with ochraceous-buff; bill larger.

Range.—Resident on the Gulf coast of Alabama and Mississippi. Straggling in winter west to High Island, Texas, and east to Wakulla County, Florida (Griscom and Nichols, 1920, p. 23). (Fig. 71.)

Distribution in Florida.—Breeds sparingly near Pensacola; of casual occurrence in winter. Known from Pensacola (specimens, October 3 and November 21, 1926; March 20, 1927; and January 15, 1928); Hurricane Island, St. Andrews Bay (specimen, February 11, 1920); and East Goose Creek, Wakulla County (specimens, December 31, 1915, and January 13, 1920). Young individuals were taken at Pensacola by Weston, October 2, 1927, and August 19, 1928; on May 15, 1929, he saw a pair of adults with young just out of the nest.

LOUISIANA SEASIDE SPARROW: *Ammospiza maritima fisheri* (Chapman)

Recognition Marks.—Similar to *howelli*, but upperparts darker brown, the head and back broadly streaked with fuscous-black; breast and sides heavily washed with ochraceous-buff.

Range.—Breeds on the coasts of Louisiana and eastern Texas. Winters south to Corpus Christi, Texas, and casually east to Florida.

Distribution in Florida.—Of casual occurrence on the Gulf coast. Known from two specimens—one taken November 2, 1891, at Tarpon Springs (now in the Museum of Comparative Zoölogy), the other, in the Biological Survey collection, taken at Pensacola, November 21, 1926.

DUSKY SEASIDE SPARROW: *Ammospiza nigrescens* (Ridgway)

Other Names: Black and White Shore Finch; Black Shore Finch

Recognition Marks.—About the size of the Northern Seaside Sparrow, but bill somewhat smaller; *upperparts black or blackish brown*, moderately edged with grayish olive and dull white; underparts white, *heavily streaked with black;* lores and bend of wing bright yellow; wings and tail fuscous or fuscous-black, edged with light yellowish olive. (Plate 58.)

RANGE.—Salt marshes on Merritt Island, Florida, from Dummitt Creek south to Indianola; also on the mainland around Salt Lake, near Titusville, and at Persimmon Hammock on the St. Johns River.[1] (Fig. 71.) This interesting species was discovered in 1872 by Charles J. Maynard (1881, p. 119), who named it *Ammodramus melanoleucus* in 1875. It had previously been named, however, by Ridgway, in 1873. It has a very restricted range, probably not more than 25 miles in length, but is very abundant in that area, and so far as known, is not migratory.

HAUNTS AND HABITS.—The marshes inhabited by this species are rather dry and not so boggy as many of the Florida marshes. They support growths of sharp-pointed rushes (*Juncus*), interspersed with open tracts covered with a growth of salt-marsh grass (*Spartina patens*), or of glasswort (*Salicornia*). The birds live and breed in all three types of vegetation. The nests are made of fine grass stems, and are placed from 4 to 16 inches above the ground, not arched, but usually concealed from view by wisps of grass carelessly arranged as if for protection from the sun. Oscar E. Baynard was the first naturalist to collect the eggs of this race, finding three sets on Merritt Island, May 21, 1914, which he described in an article in The Oölogist (1914, p. 130). These nests were all in the *Salicornia* marsh, one to ten inches above the ground. On that date, also, he noted several nests containing young. In 1926, D. J. Nicholson found two nests with young on May 2; about 17 nests containing either eggs or young from June 20 to 27; and two sets of fresh eggs on July 23. In 1927, he observed 8 nests containing eggs on April 19, 24, and 30. Some of these were in the dense growth of *Salicornia*, some in isolated bunches of *Spartina*, and others in the tall rushes (*Juncus*), 12 to 14 inches above the ground. From May 2 to 9, 1928, A. H. Hardisty noted about 30 nests, half of which contained eggs in all stages of incubation, the rest young. The eggs numbered 4 in the majority of nests, 3 in some.

On the Merritt Island marshes, in May, 1925, I found these Sparrows abundant, and much less shy than most Seaside Sparrows. The males were singing almost constantly from low perches on top of bunches of grass or rushes. Comparing their song with that of *pelonota*, which I had been hearing a few days previously, I noted a similarity but some differences. It begins with a single (rarely double) liquid note, followed by a short, buzzing trill. It is not so long nor so loud as the song of the Smyrna Seaside, and the final "buzz" is more pronounced. One bird was heard giving a more elaborate flight song. Francis Harper observed these birds at Wilson Landing in February, 1917, and also found them tame and easily called from their retreats by "squeaking." They alighted in small bushes and appeared excited, twitching their wings nervously and bobbing up and down.

FOOD.—Six stomachs of birds of this species were examined in the Biological Survey. The food contents consisted largely of insects and spiders, with some vegetable matter. Grasshoppers and crickets composed about 37 per cent of the total, and spiders about 25 per cent. Other items were beetles, bugs, horse flies, dragon flies, lepidopterous larvae, Hymenoptera, and a praying mantis. The vegetable matter consisted of a few seeds of sedges, one seed of wax myrtle, and a quantity of tubers of a grass or sedge.

[1] Specimens taken in March, 1905, by W. W. Worthington, now in collection of American Museum of Natural History.

CAPE SABLE SEASIDE SPARROW: *Ammospiza mirâbilis* (Howell)

RECOGNITION MARKS.—About the size of Scott's Seaside; *upperparts more greenish and underparts more whitish* than in any of the races of *maritima;* hind neck and back yellowish olive, streaked with fuscous; scapulars edged with white; tail fuscous, edged with citrine drab (olive drab); lores yellow; wings fuscous, edged with olive; edge of wings yellow; underparts white, moderately streaked on breast and sides with fuscous or mouse gray. (Plate 58.)

RANGE.—Known only from the coastal prairie near Cape Sable—an area about 6 miles in length and not more than half a mile in breadth. Here the birds occur rather sparingly in small, more or less isolated colonies. There is no country suitable for Seaside Sparrows on either coast for a long distance northward. (Fig. 71.)

The species was discovered by the writer in February, 1918, when six specimens in unworn winter plumage were collected. The nest and eggs were first discovered by Harold H. Bailey (1921, p. 129) in 1921; subsequently others were found by E. J. Court in 1925, and by D. J. Nicholson in 1927. About 12 additional specimens were taken for the Biological Survey collection in April, 1926, and a few have been taken by other collectors for various museums. D. J. Nicholson (1928j, p. 237) records the discovery of a singing male of this species, May 3, 1928, on a savanna about 6 miles northwest of Pinecrest, and 8 or 10 miles from the Gulf; further search in this region may show that the species has a wider range than our present knowledge indicates.

HAUNTS AND HABITS.—These Sparrows live in patches of marsh grass (*Spartina patens juncea*) on the brackish prairie near Cape Sable, from half a mile to a mile from the shore of the Gulf of Mexico. Like the other species of Seaside Sparrows, they are very shy and secretive, spending most of their time on or near the ground, concealed in the vegetation. Conditions in their habitat vary from year to year, the prairie frequently being flooded by heavy rains or by tidal waves from the Gulf, and at other times becoming practically dry and having the vegetation destroyed by frequent fires. For this reason the birds are forced to move from time to time to find suitable breeding places, and quite possibly their numbers are kept down by these agencies. John B. Semple states in a letter dated January 3, 1930: "The Cape Sable Seaside Sparrow is still in its old haunts in the long grass, notwithstanding that last October five feet of salt water, driven by a wind of about 100 miles per hour, passed over the entire range of this little bird."

During the breeding season, late in March and April, the birds flush rather easily from the tall grass, flying with a steady flight for a distance of 100 to 200 yards before dropping into the grass again. They usually run as soon as they alight and are hard to flush a second time. On April 2, 1926, a windy day, we heard the song of the birds a number of times, coming apparently from well down in the thick marsh grass, and several times heard them sing in the air as they arose for a short flight. The ordinary song resembles that of the other Seaside Sparrows, but seems to be simpler in character. I wrote it at the time *churr-buz-z-z-z,* the last syllable accented and prolonged. In this buzzing character it most resembled the song of the Dusky Seaside (*nigrescens*). The flight song was of longer duration and was preceded by a sort of twittering chirrup.

The nests are placed on or near the ground in bunches of marsh grass. The one taken

by Bailey, May 12, 1921, "was composed of dry salt-marsh grass, and lined with very fine grasses, attached to some upright marsh grass waist high and growing in a brackish swale, and completely covered by matted-down dead marsh grass." The three eggs were well incubated. The nest taken by Court, March 29, 1925, contained five fresh eggs, and was situated on the ground at the base of a clump of grass. D. J. Nicholson found a nest with four eggs, about one-third incubated, April 10, 1927, and on April 13, two nests each containing three young. Two of these were built in marsh grass (*Spartina*), about 16 inches from the ground, and the third in salt grass (*Salicornia*), nearer the ground. The five eggs collected by Court measure as follows: 19.5 x 15.5 mm.; 20 x 15.7 mm.; 20.3 x 16 mm.; 20.5 x 15.6 mm.; and 20.7 x 16.2 mm. They are pale bluish white, heavily and rather evenly spotted with different sized spots of verona brown and lavender gray. They are very similar to certain eggs of the Smyrna Seaside, but the ground color is more bluish, and the eggs are less pointed than the average egg of that race.

Food.—Stomachs of 15 specimens of this species have been examined in the Biological Survey; the food consisted almost wholly of insects and spiders, with a few small amphipods and mollusks, and about 3 per cent of vegetable debris. Beetles of many species composed the largest single item, and spiders were next in importance. Other insects taken were dragon-fly nymphs, moths and their larvae, bugs, parasitic wasps, flies, crickets, and locusts.

EASTERN VESPER SPARROW: *Pooecetes gramineus gramineus* (Gmelin)

Other Names: **Grass Finch; Bay-winged Bunting**

Recognition Marks.—About the size of the Song Sparrow (length, 5.75 to 6.25 inches; spread, 10 to 11 inches). Upperparts wood brown (light brown) or hair brown (dark drab), streaked with fuscous; underparts white, faintly washed with buff and streaked on breast and sides with fuscous; an inconspicuous patch of reddish brown on shoulder of the wing; tail fuscous, the outer feathers mainly white, *showing conspicuously in flight.* (Plate 57.)

Range.—Breeds from central Manitoba, central Ontario, central Quebec, and Cape Breton Island south to eastern Nebraska, central Missouri, Kentucky, and North Carolina. Winters from the southern part of its breeding range south to the Gulf coast, and west to middle Texas. Casual in Bermuda and Yucatan.

Distribution in Florida.—An abundant winter resident in northern Florida; less common in the southern part; one record from Key West—a specimen taken January 29, 1888 (Scott, 1889a, p. 321). First arrivals from the North in autumn were recorded at Pensacola, October 28, 1928; De Funiak Springs, October 5, 1908; Chipley, November 2, 1902; Tallahassee, October 13, 1904; Fernandina, October 25, 1906; and Seven Oaks, November 10, 1902. Nicholson noted 40 individuals at Orlando, March 1, 1914, and W. I. Eck (1908, p. 33) counted 65 at Melrose on December 25, 1907. J. A. Loring reported the species common at Micco in January and February, 1895; E. J. Brown has seen it at Lemon City; and Holt and Sutton observed two individuals at Cape Sable, March 14, 1924. Four were seen at La Belle, March 5, 1912 (Phelps, 1912, p. 124). The last seen in spring were noted at Winter Park, April 5, 1914; Old Town, April 15, 1893; Gainesville, April 9, 1887; Daytona Beach, April 4, 1924; Tallahassee, April 13, 1902; and Pensacola, April 8, 1926.

HAUNTS AND HABITS.—The Vesper Sparrow is essentially a ground dweller, occurring in winter in flocks in cultivated fields, pastures, and along roadsides. The birds run rapidly over the ground, and upon taking flight display the white outer tail feathers.

FOOD.—The food of this species, as studied in the Biological Survey (Judd, 1901, pp. 56–58) was found to consist of insects (31 per cent), grain (11 per cent), grass seed (16 per cent), and weed seed (42 per cent). Beetles, grasshoppers, and caterpillars composed the greater part of the insect food. The bird has no injurious habits, and is considered a beneficial species.

EASTERN LARK SPARROW: *Chondéstes grâmmacus grâmmacus* (Say)

RECOGNITION MARKS.—About the size of the English Sparrow (length, 5.75 to 6.75 inches; spread, 10.50 to 11.10 inches). Head marked with black and brown (warm sepia); back hair brown (dark drab), streaked with fuscous; underparts white, *with a dark brown spot in middle of chest; a blackish brown streak on each side of throat;* tail rounded, hair brown, *with conspicuous white patches* at the tip.

RANGE.—Breeds from northwestern Minnesota, central Wisconsin, and southern Ontario south to southern Louisiana and central Alabama, and east to western Pennsylvania, western Maryland, and West Virginia. Casual in Nova Scotia, Massachusetts, New York, New Jersey, and North Carolina. Known in winter only in southern Mississippi and Florida.

DISTRIBUTION IN FLORIDA.—Of casual occurrence in fall, winter, and spring. Scott (1889a, p. 322) records specimens taken at Punta Rassa, September 26, 1886, and at Key West, October 6, 1887; also two individuals seen at Tarpon Springs, September 19, 1886, and November 10, 1887. Pennock (1920a, p. 51) reports two birds at St. Marks, April 10, 1915, and Lester W. Smith mentions one seen at Arcadia, December 5, 1919. Nehrling records the species common at Gotha in winter. A specimen in the United States National Museum was taken at Manatee in October, 1872; one in the Florida State Museum, at Seven Oaks, January 1, 1904; and one in the collection of the late L. A. Fuertes, at Flamingo, April 5, 1908.

HAUNTS AND HABITS.—The Lark Sparrow is a bird of the prairies, but in winter is likely to be found in pastures, cultivated lands, or any open situation. It lives on or near the ground and somewhat resembles the Vesper Sparrow in general appearance, although its rounded tail with white-tipped feathers suggests the Mourning Dove.

PINE-WOODS SPARROW: *Aimóphila aestivâlis aestivâlis* (Lichtenstein)

RECOGNITION MARKS.—About the size of the Song Sparrow (length, 5.75 to 6.20 inches; spread, 7.60 to 8.30 inches; tail, 2.25 to 2.68 inches, rounded, the feathers rather narrow). Upperparts mixed walnut brown and fuscous, edged with neutral gray; underparts grayish white, washed on the breast with dull drab; tail fuscous. (Plate 49.)

RANGE.—Resident in peninsular Florida north to southeastern Georgia.

DISTRIBUTION IN FLORIDA.—An abundant resident over the greater part of the State, south at least to Fort Pierce and Immokalee, and west to St. Marks. Mrs. Byrd observed one individual at Princeton, December 10 and 13, 1917, and Mercer (1914, p. 48) reported 9 seen near Miami in December. Scott (1889a, p. 323) found the species a common resident at Tarpon Springs and on the Pinellas peninsula. J. B. Ellis (1915, p. 209) recorded a specimen taken at Chokoloskee, October 12, 1915, and M. S. Crosby noted one

bird at Deerfield, February 18, 1924. We found the species common at Mayo, Zellwood, Pine Castle, Richland, Erie, Lake Gentry, Illahaw, and Citrus Center, and less numerous at Eau Gallie, Istokpoga Lake, Port Richey, and Braden River. Typical specimens have been examined from Immokalee, Citrus Center, Braden River, Fort Bassenger, Port Richey, Clearwater, Kissimmee, Lake Arbuckle, San Mateo, Welaka, Matanzas Inlet, Jacksonville, and Amelia Island. Specimens from St. Marks are not typical, but show approach to *bachmani*.

HAUNTS AND HABITS.—The Pine-woods Sparrow is well named, for its favorite habitat is the dry, open pine forest, in which there is a more or less dense growth of low scrub palmetto (*Serenoa serrulata*). This shrub apparently furnishes a large part of the attraction, for we find the birds numerous on certain prairies where trees are lacking but where a heavy growth of palmetto prevails. The birds make good use of this cover and are hard to dislodge once they have sought shelter beneath the scrub. In the breeding season, the males sing frequently from a low perch on a tree or shrub, but if approached too closely, they dive into the nearest thicket. On one occasion I observed a bird singing on a low stump; soon he flew about a hundred yards to a taller snag and sang again; then a little later he flew to a perch 40 feet up in a pine tree, and from there launched into the air and sang as he fluttered down over the snag he had left. The song, though not loud, is musically the most attractive of any of the Florida sparrows' songs. The reedlike tones are sweet and clear, suggesting the song of Bewick's Wren, but somewhat stronger and of richer quality. Successive songs, delivered by a single bird, are frequently pitched in different keys, and the phrases are varied in form as well as in pitch.

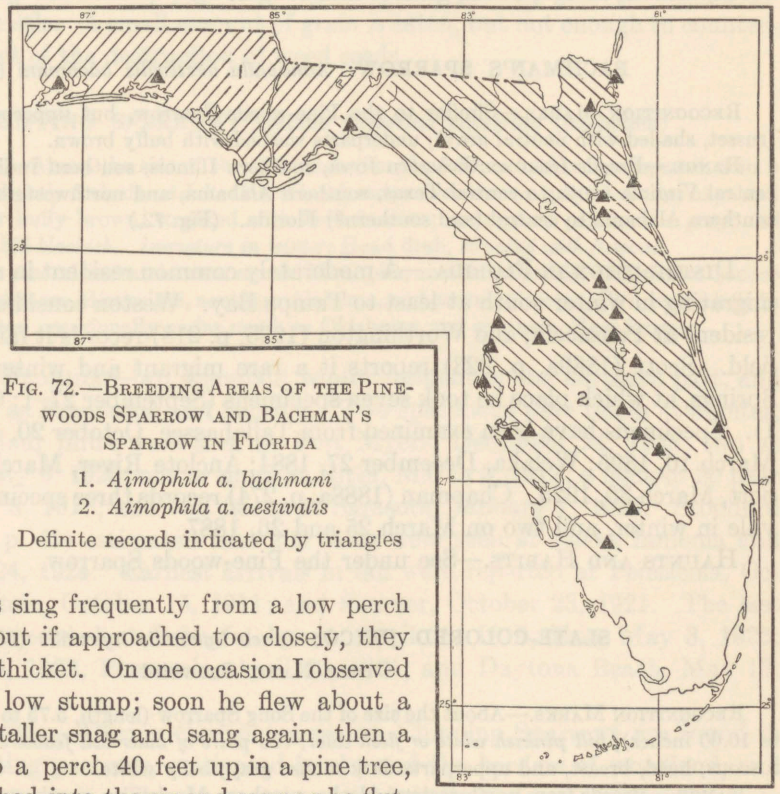

FIG. 72.—BREEDING AREAS OF THE PINE-WOODS SPARROW AND BACHMAN'S SPARROW IN FLORIDA

1. *Aimophila a. bachmani*
2. *Aimophila a. aestivalis*

Definite records indicated by triangles

The nests of this species are placed on the ground, usually in a clump of low palmettoes or at the foot of a small bush, and well hidden. They are constructed of fine grasses and usually are domed over. A nest found under a palmetto leaf, however, was open above, like most sparrow nests. The nesting season begins early in April and continues until

the last of July. Eggs were noted at New Smyrna, April 20; Gainesville, May 21; Jacksonville, May 30; and Orlando, July 27. At Lake Gentry, May 7, 1925, I found a nest containing 4 small young. The eggs are pure white, and number 3 or 4 to a clutch.

FOOD.—Examination of the stomachs of 8 specimens of this species taken in Florida showed the bird's food to consist mainly of insects and spiders, with smaller proportions of seeds of grasses and other plants. The insects most frequently taken were grasshoppers and crickets and their allies, these composing the major portion of the food in four of the stomachs and being present in all but one. Other insects eaten were beetles, moths, leaf hoppers, caterpillars, and Hymenoptera. Seeds taken included blueberry seeds, pine seeds, and seeds of various grasses and sedges.

BACHMAN'S SPARROW: *Aimóphila aestivâlis bâchmani* (Audubon)

RECOGNITION MARKS.—Similar to the Pine-woods Sparrow, but upperparts much more reddish (russet, shaded with neutral gray); underparts washed with buffy brown.

RANGE.—Breeds from southeastern Iowa, southern Illinois, southern Indiana, southern Ohio, and central Virginia south to central Texas, southern Alabama, and northwestern Florida. Winters from southern Alabama to central (and southern?) Florida. (Fig. 72.)

DISTRIBUTION IN FLORIDA.—A moderately common resident in northwestern Florida, migrating in winter south at least to Tampa Bay. Weston considers it a rare permanent resident at Pensacola, and Worthington (1926, p. 218) records it fairly common at Whitfield. Scott (1889a, p. 323) reports it a rare migrant and winter resident at Tarpon Springs, at which place he took seven specimens (September 27, 1; October, 5; February, 1). Specimens have been examined from Tallahassee, October 20, 1904; Lake Arbuckle, March 10, 1895; Welaka, December 27, 1884; Anclote River, March 18, 1926; and Gulfport, March 30, 1925. Chapman (1888a, p. 274) records three specimens taken at Gainesville in winter, and two on March 25 and 26, 1887.

HAUNTS AND HABITS.—See under the Pine-woods Sparrow.

SLATE-COLORED JUNCO: *Júnco hyemâlis hyemâlis* (Linnaeus)

OTHER NAME: Snowbird

RECOGNITION MARKS.—About the size of the Song Sparrow (length, 5.75 to 6.50 inches; spread, 9.25 to 10.00 inches); *bill pinkish white or flesh color; two pairs of outer tail feathers wholly white,* the others fuscous; head, breast, and upperparts dark mouse gray; belly white.

RANGE.—Breeds from northwestern Alaska, northern Mackenzie, northern Manitoba, and northern Quebec south to central Alberta, northern Minnesota, central Michigan, Ontario, and in the mountains to Pennsylvania, New York, and Massachusetts. Winters throughout eastern United States and southern Ontario south to the Gulf coast and Florida. (Another race occupies the southern Alleghenies from Maryland to northern Georgia.)

DISTRIBUTION IN FLORIDA.—A rare and irregular winter visitant in the northern part. Merriam (1874, p. 87) reports the species seen at Green Cove Springs in April, 1873. R. W. Williams (1914, p. 497) records 12 birds seen at Tallahassee, December 3, 1911. Weston, at Pensacola, has seen the species in small numbers on several occasions (March 18, 1919; December 8, 1921; and February 12 and 26, 1926). It has been recorded, also,

at De Funiak Springs, January 1, 1908; Hastings, December 15, 1918; New Smyrna, October 27, 1925; St. Augustine, December 30, 1915; Wekiva Springs, February 12, 1917; and Chokoloskee, 2 specimens, October 11, 1915 (Ellis, 1915, p. 209).

HAUNTS AND HABITS.—During the winter season the Junco occurs in loose flocks, frequenting hedges, thickets, weedy fields, and open woodland, feeding mainly on the ground, where it scratches for its food among fallen leaves. The birds are not wild, but when alarmed they flit away with their tails spread, showing the white outer feathers, and uttering a sharp *tsip*.

FOOD.—While in the South Juncos feed almost entirely on the seeds of various weeds and grasses, including amaranth, pigweed, ragweed, crab grass, pigeon grass, broomsedge, and Russian thistle. A small amount of grain is eaten, but not enough to counterbalance the good effect of the destruction of weed seeds.

EASTERN CHIPPING SPARROW: *Spizella passerina passerina* (Bechstein)

RECOGNITION MARKS.—About the size of the Goldfinch (length, 5.00 to 5.85 inches; spread, 8 to 9 inches; tail, 2.25 inches, slightly forked). *Adult: Crown hazel;* stripe over the eye grayish white; nape and rump neutral gray; back buffy brown, streaked with dark fuscous; underparts pale smoke gray; tail hair brown (dark drab); *bill blackish. Immature in winter:* Head drab, *streaked with fuscous.*

RANGE.—Breeds from central Saskatchewan, central Manitoba, northern Ontario, and central Quebec south to central Texas, southern Mississippi, southern Alabama, and central Georgia. Winters chiefly in the southern United States, occasionally as far north as Oklahoma and southern New Jersey.

DISTRIBUTION IN FLORIDA.—An abundant winter resident in the northern part, and common as far south as Bradenton and Sebring. Two specimens were taken at Jupiter, February 12, 1921; four birds were seen at Fort Myers, December 24, 1925; two at Punta Gorda, February 6, 1926; one or more at Ritta, March 9, 1912; a flock of 20 near Bassenger, February 3, 1917; and two flocks at Sarasota, January 7, 1926. Stoddard and Handley (1925, p. 45) estimated that 200 birds were seen at Lakes Iamonia and Jackson, December 24, 1924. Earliest arrivals in fall were reported at Pensacola, October 17, 1926; Orlando, October 15, 1911; and Sumner, October 23, 1921. The last seen in spring were recorded at Lake Istokpoga, April 18, 1910; Erie, May 3, 1925; Tallahassee, April 18, 1902; Pensacola, April 20, 1924; and Daytona Beach, May 13, 1926 (2 specimens).

HAUNTS AND HABITS.—During the winter season Chipping Sparrows are found in loose flocks, frequenting pastures, cultivated lands, and the borders of woodland, and feeding mainly on the ground. They are gentle, sociable little birds, and in their summer homes are fond of nesting in dooryards, orchards, or gardens.

FOOD.—Examination in the Biological Survey of 250 stomachs of birds of this species showed the food contents to be 38 per cent animal, and 62 per cent vegetable, matter. Of the vegetable matter, 4 per cent was grain, principally oats, 48 per cent grass seed, and 10 per cent other seeds, principally of weeds. The insects consumed comprised weevils and other beetles (11 per cent), caterpillars (9 per cent), and grasshoppers (10 per cent), with smaller numbers of bugs, ants, and wasps. Caterpillars appear to be a favorite food of the Chipping Sparrow, and include such pests as cankerworms, currant worms, and tent caterpillars (Judd, 1901, p. 77).

EASTERN FIELD SPARROW: *Spizélla pusílla pusílla* (Wilson)

RECOGNITION MARKS.—About the size of the Chipping Sparrow (length, 5.10 to 6.00 inches; spread, 7.75 to 8.50 inches; tail, 2.25 to 2.75 inches), but *tail longer. Bill reddish;* legs and feet flesh color; crown pale hazel, indistinctly streaked with wood brown (light brown); back wood brown, streaked with fuscous and edged with hazel; tail hair brown (dark drab); underparts dull white, washed on breast with light pinkish cinnamon.

RANGE.—Breeds from southern Minnesota, southern Michigan, southern Quebec, and southern Maine south to central Texas, central Louisiana, southern Alabama, and northwestern Florida. Winters from Missouri, Illinois, southern Pennsylvania, and New Jersey to the Gulf coast.

DISTRIBUTION IN FLORIDA.—A common winter resident in the northern and central parts, as far south as Orlando and Eustis; occurs rarely south to Fort Pierce (November 15 and December 24, 1918, and February 11, 1919); Tarpon Springs (January 16, 1890); Arcadia (March 7, 1918); Bonita Springs (January 29, 1925); Sanibel Island (February 9 and March 16, 1923); and Marco (specimen, March 8, 1922). Wayne (1895, p. 365) noted the birds breeding at Waukeenah, and R. W. Williams (1906, p. 155) found an old nest at Tallahassee, but the species is apparently very rare or casual in the breeding season. Weston reported a single bird seen at Pensacola June 11, 1922, but no evidence of nesting was discovered. First arrivals in autumn were recorded at Pensacola, November 2, 1924; Whitfield, November 10, 1902; Chipley, November 20, 1903; and Fernandina, November 14, 1906. The last seen in spring were noted at Orlando, March 22, 1916; Gainesville, April 16, 1887; and Pensacola, April 3, 1921.

HAUNTS AND HABITS.—The Field Sparrow dwells in old, neglected fields and bushy pastures, placing its nest either on the ground or in low bushes. The birds are rather shy and retiring, and are found usually at some distance from farm buildings. They are persistent singers, rendering their simple but pleasing trill at all hours of the day, even in the heat of midsummer. In winter they often associate with Chipping Sparrows and other ground-feeding species.

FOOD.—The food of this species consists of about 41 per cent animal, and 59 per cent vegetable, matter. The animal food includes beetles, caterpillars, grasshoppers, leafhoppers, ants, flies, wasps, and spiders. Most of the vegetable food consists of the seeds of grasses, such as crab grass, pigeon grass, and broomsedge. A small quantity of grain is eaten, chiefly oats taken in summer on stubble (Judd, 1901, p. 78).

WHITE-CROWNED SPARROW: *Zonotríchia leucóphrys leucóphrys* (Forster)

RECOGNITION MARKS.—Slightly larger than the English Sparrow, with longer tail (length, 6.50 to 7.00 inches; spread, 9.20 to 10.00 inches). *Adult:* Center of crown white, with a broad black stripe on each side; nape smoke gray; back drab or hair brown (dark drab), broadly streaked with bister; wings and tail fuscous, the wings with two narrow white bars; underparts pale smoke gray, the flanks washed with drab. *Immature in winter:* Similar to the adult, but head mainly brownish (warm sepia); upperparts more buffy brown.

RANGE.—Breeds from northern Manitoba and northern Quebec to southern Quebec and southern Greenland; also in high mountains from southern Oregon to central California, and east to Wyoming and southern New Mexico. Winters from southern Kansas and the Ohio Valley south to Louisiana, Mississippi, and southern Mexico.

DISTRIBUTION IN FLORIDA.—Casual in fall and winter. Known at present from several sight records, as follows: Tallahassee, April, 1893, numbers seen by Bradford Torrey (1894, pp. 191, 234); De Funiak Springs, October 29 and 30, 1909, five seen by Angus McKinnon; Titusville, February 13, 1924, one seen by M. S. Crosby.

WHITE-THROATED SPARROW: *Zonotrichia albicollis* (Gmelin)

RECOGNITION MARKS.—Similar in size to the White-crowned Sparrow. *Adult male:* Crown blackish brown, with a narrow median stripe of white and another on each side behind the eyes; *a patch of bright yellow from bill to eye; throat white;* breast smoke gray; belly white; back russet, broadly streaked with fuscous-black; rump hair brown (dark drab) or drab; tail pale fuscous. *Adult female:* Similar to the male, but white on head and throat duller. *Immature in winter:* Similar to the adult female, but head mainly brownish like the back with median stripe buffy instead of white. (Plate 57.)

RANGE.—Breeds from northern Mackenzie, northern Manitoba, and central Quebec south to southern Montana, central Minnesota, central Wisconsin, southern Ontario, and in the mountains of Pennsylvania, New York, and Massachusetts. Winters from Missouri, the Ohio Valley, and Massachusetts south to Florida, the Gulf States, and northeastern Mexico.

DISTRIBUTION IN FLORIDA.—A common winter resident in the northern part; rare in the central and southern parts. It is reported common at Pensacola, Tallahassee, Gainesville, Palatka, and in Levy County; uncommon at Daytona Beach; Titusville (February 13, 1924); Oxford (October 30, 1920); and Royal Palm Hammock (November 4 to December 28, 1917). W. Leon Dawson noted the species at Cape Sable, April 11, 1927. Earliest arrivals in autumn were recorded at Daytona Beach, October 23, 1924; Tallahassee, October 27, 1904; and Pensacola, October 26, 1924. The last in spring were seen at Gainesville, April 30, 1919; Tallahassee, May 3, 1903; Pensacola, May 3, 1925; and Amelia Island, April 30, 1923.

HAUNTS AND HABITS.—White-throated Sparrows are found in winter in small flocks, chiefly in hedges, brush piles, thickets, and open woodland, where they spend much of their time on the ground scratching among dead leaves in search of food. If alarmed, they fly into the underbrush and give their characteristic metallic alarm note. During the spring migration the plaintive, whistled song is frequently heard.

FOOD.—The White-throated Sparrow feeds largely upon seeds of grass and weeds, and on wild fruits and berries. It is particularly fond of berries, which in summer and autumn compose about a fourth of its food. At this time it eats the fruit of the blueberry, wild cherry, mountain ash, greenbrier, strawberry, spice bush, wild sarsaparilla, elder, blackberry, dogwood, and high-bush cranberry. The principal weed seeds consumed are those of ragweed and bindweed, these two elements forming one-fourth of the food of the year. During October, ragweed alone constitutes 45 per cent of the food. The insect food comprises wasps, beetles, ants, and weevils, including the boll weevil. (Judd, 1901, pp. 72–75.)

EASTERN FOX SPARROW: *Passerella iliaca iliaca* (Merrem)

RECOGNITION MARKS.—About the size of the Hermit Thrush (length, 6.50 to 7.25 inches; spread, 10.50 to 11.50 inches; tail, 2.75 to 3.15 inches). Upperparts mouse gray, more or less heavily streaked or spotted with russet; tail chestnut or hazel; underparts white, heavily spotted with russet.

RANGE.—Breeds from the tree limit in northern Alaska, northern Mackenzie, northern Ontario, and northern Quebec south to central Alberta, central Manitoba, and Newfoundland. Winters from the Ohio and Potomac Valleys to central Texas, central Alabama, and central Florida.

DISTRIBUTION IN FLORIDA.—A rare winter resident in the northern part. At Pensacola, Weston has observed it but a few times—February 4, 5, 16, and 17, 1918, and February 8, 1919. At Winter Park, Nicholson noted about 10 in November and December, 1913, and shot a specimen on February 2, 1914. At Oxford, Mrs. Byrd recorded the species twice in the winter of 1918–19. Scott (1889a, p. 323) gives but a single record—one taken at Punta Rassa, in November, 1886. J. A. Allen (1871, p. 279) mentions a single bird seen by G. A. Boardman at Enterprise. Worthington noted several on Amelia Island, November 13, 1905, and Beers reported one at Lake Hatchineha, February 8, 1907.

HAUNTS AND HABITS.—Fox Sparrows, during the winter season, frequent thickets and open woodland, often in company with other species of sparrows. They feed chiefly on the ground, scratching for food among dry leaves and rubbish. The notes of the bird are a faint *tsip* and a sharp *chuck*.

FOOD.—The food of the Fox Sparrow consists largely of vegetable matter (86 per cent), and includes cedar berries, pokeberries, holly berries, frost grapes, and the fruit of the burning bush (*Euonymus*). "Half of the food consists of ragweed and polygonum and more than a quarter of fruit. . . . It does no direct damage to cultivated fruit, though it occasionally eats the buds of peach trees and pear trees" (Judd, 1901, p. 88).

LINCOLN'S SPARROW: *Melospiza lincolni lincolni* (Audubon)

RECOGNITION MARKS.—Much like the Song Sparrow, but smaller (length, 5.50 to 6.00 inches; spread, 7.75 to 8.25 inches; tail, 2.10 to 2.50 inches). Upperparts usually more grayish (dark drab, streaked with fuscous); *breast with a band of pale pinkish buff*, narrowly streaked with fuscous.

RANGE.—Breeds from northern Alaska, southern Mackenzie, northern Manitoba, and northern Quebec south to northern Minnesota, central Ontario, northern New York, New Brunswick, and Nova Scotia, and in high mountains to southern California and northern New Mexico. Winters from southern California, Oklahoma, northern Mississippi, and central Georgia south to southern Mexico and Guatemala.

DISTRIBUTION IN FLORIDA.—A rare migrant or winter resident. Known from only three records, as follows: H. W. Ballantine saw one bird at Orlando, January 23, 1911; Griscom (1919, p. 588) observed one at Lake Iamonia, March 26, 1919; and H. L. Stoddard took a specimen on the Whitney Plantation, Leon County, March 13, 1925.

HAUNTS AND HABITS.—The Lincoln Sparrow much resembles the Song Sparrow in appearance and habits, and is likely to be found on or near the ground in brushy situations.

SWAMP SPARROW: *Melospiza georgiana* (Latham)

RECOGNITION MARKS.—Slightly smaller than the Song Sparrow, with shorter tail (length, 5.00 to 5.75 inches; spread, 7.50 to 8.00 inches; tail, 2.16 to 2.50 inches). *Winter plumage:* Crown streaked with black and russet, the median stripe gray; nape neutral gray; back pale russet, broadly streaked with fuscous-black and buffy white; rump buffy brown; wings and tail fuscous, with russet edgings; under parts white, clouded with light neutral gray on the breast and washed with buffy brown on the flanks.

RANGE.—Breeds from central Mackenzie, northern Manitoba, central Quebec, and Newfoundland south to Nebraska, Missouri, northern Illinois, West Virginia, and New Jersey. Winters from Nebraska, Ohio Valley, and Massachusetts south to Florida, the Gulf coast, and Mexico (Tamaulipas and Jalisco).

DISTRIBUTION IN FLORIDA.—An abundant migrant and winter resident in the northern and central parts; less numerous in the southern part. It was reported abundant at Gainesville by Chapman (1888a, p. 274), and at Tarpon Springs by Scott (1889a, p. 323). Mearns collected 11 specimens at Kissimmee in January and February, 1901, and Scott took 5 or more at Fort Myers in the winter of 1891–92. Maynard (1881, p. 118) reported the species common at Miami, and I found it not uncommon at Royal Palm Hammock in January and February. Holt and Sutton (1926, p. 436) noted birds on the lakes near Cape Sable, in January and March, 1924. T. D. Burleigh found them plentiful near Miami, December 11, 1929.

First migrants from the North in autumn were recorded at Pensacola, October 8, 1922; Chipley, October 4, 1903; Tallahassee, October 6, 1904; and St. Marks, October 8, 1918. The last seen in spring were noted at Arcadia, April 27, 1920; Gainesville, April 27, 1887; Amelia Island, April 27, 1906; Daytona Beach, May 9, 1926; St. Marks, May 9, 1916; Whitfield, April 28, 1903; and Pensacola, May 4, 1919.

HAUNTS AND HABITS.—Swamp Sparrows are by no means confined to swamps in the winter season, but are found most frequently in fields overgrown with brush and briers, and particularly in patches of broomsedge where the ground is moist. The birds are silent at this season and quite inconspicuous as they feed on the ground, threading their way through the brush like mice. On the Aucilla River, in January, 1920, nearly every day we observed a few Swamp Sparrows coming out of the marsh near our camp to pick up crumbs we had thrown out on the flat along the river. In the Everglades, April 7, 1923, I found the birds numerous in weeds along the canal banks.

FOOD.—More than half of the food of this species consists of vegetable matter, chiefly the seeds of sedges, grasses, and various weeds, including bindweed and ragweed. The insect food includes grasshoppers, caterpillars, leaf beetles, weevils, bugs, ants, and flies (Judd, 1901, p. 87).

EASTERN SONG SPARROW: *Melospiza melódia melódia* (Wilson)

RECOGNITION MARKS.—Slightly smaller than the White-throated Sparrow (length, 5.90 to 6.50 inches; spread, 8.25 to 9.25 inches; tail, 2.65 to 3.00 inches). *Winter plumage:* Upperparts hair brown (dark drab) or mouse gray, more or less heavily shaded with russet, the back often broadly streaked with fuscous-black; head mainly tawny, finely streaked with blackish; tail snuff brown; underparts white, streaked on breast and sides with dark fuscous and russet—these markings tending to form a spot in the middle of the breast. (Plate 57.)

RANGE.—Breeds from southern Mackenzie, northern Manitoba, northern Ontario, and central Quebec south to southern Nebraska, central Missouri, Kentucky, and northern Georgia. Winters from Nebraska, Illinois, and Massachusetts south to Florida and the Gulf coast.[1]

DISTRIBUTION IN FLORIDA.—A common winter resident in the northern part as far south as Orlando; uncommon or rare in the southern part. It is recorded as common at Gainesville (Chapman, 1888a, p. 274) and at Whitfield (Worthington and Todd, 1926, p.

[1] Bangs (1912, p. 85) described the "Florida Song Sparrow" as *Melospiza melodia beata* from two specimens taken at Enterprise, April 17, 1859, supposing them to represent a resident breeding form. The species does not breed in Florida, however, and Todd (Worthington and Todd, 1926, p. 218) asserts that the name *beata* should be applied to the birds of the region west of the Appalachian Mountains. Pending a thorough revision of the eastern Song Sparrows, it is not considered desirable to introduce "*beata*" as a valid form.

218), and as regular, but uncommon, at Tarpon Springs (Scott, 1889a, p. 323). Pennock has taken a few specimens at Punta Gorda (February 22 and March 2, 1926), and Crosby noted a few at Fort Myers, December 23 to 26, 1925. Records are at hand from Pensacola, Pass-a-Grille, Anna Maria Key, Rosewood, Titusville, Fort Pierce, Princeton (December 13, 1917), Royal Palm Hammock (November 11 and December 24, 1917), and Flamingo (1, February 25, 1927, Christy). Stoddard and Handley (1925, p. 45) counted 16 birds around Lakes Iamonia and Jackson, December 24, 1924.

First arrivals from the North appeared at Pensacola, October 18, 1929; Chipley, October 18, 1902; St. Marks, October 9, 1916; Tallahassee, October 16, 1904; and Glenwood, October 23, 1905. The last birds seen in spring were noted at Orlando, March 30, 1916; Hastings, April 1, 1919; Gainesville, March 31, 1887; Chipley, April 1, 1904; Enterprise, April 17, 1859; Wilson, April 27, 1923; and Pensacola, March 26, 1922.

HAUNTS AND HABITS.—The Song Sparrow, so well known in the North by its cheery song, is practically silent during its stay in the South, except for its metallic, characteristic *tchip*. At that season the birds frequent thickets and neglected, brushy fields, particularly in low, wet spots overgrown with briers or tall grasses, associating in small loose companies, but not in compact flocks.

FOOD.—Examination in the Biological Survey of more than 400 stomachs of this species showed its food to consist of animal matter, mainly insects, about one-third, and vegetable matter, mostly seeds, about two-thirds. The insects taken comprised beetles, 9 per cent; Orthoptera (locusts, crickets, grasshoppers, etc.), 7 per cent; moths and their larvae, 6 per cent; Hymenoptera (ants, bees, etc.), 4 per cent; bugs, 3 per cent; and flies, 2 per cent. Of the vegetable food, 3 per cent consisted of ragweed; 5 per cent of grain; 16 per cent of *Polygonum* (bindweed) and related seeds; 24 per cent of grass seed; and 18 per cent of miscellaneous seeds, such as those of wild sunflower, amaranth, clover, purslane, spurge, dandelion, chickweed, dock, and sheep sorrel. (Judd, 1901, pp. 82–86.)

EASTERN SNOW BUNTING: *Plectróphenax nivâlis nivâlis* (Linnaeus)

OTHER NAME: Snowflake

RECOGNITION MARKS.—Larger than the English Sparrow (length, 6 to 7.35 inches; spread, 12 to 13 inches). *Winter plumage:* Head sayal brown (pale snuff brown), mottled with white; back black, heavily overlaid with wood brown (light brown); underparts white, washed on breast and sides with sayal brown; wings fuscous, *with large white patches* on the secondaries.

RANGE.—Breeds in the Arctic regions south to northern Alaska and Ungava. Winters from Unalaska, southern Alberta, northern Manitoba, and central Quebec south to northern United States, and irregularly to northern California, Colorado, Kansas, Indiana, Ohio, and North Carolina. Casual in Florida and Bermuda.

DISTRIBUTION IN FLORIDA.—Known from a single record—a specimen taken by Charles B. Cory at Chester Shoals, about 1897, late in January or February. This information was furnished by Mr. Cory in a letter dated February 3, 1921, in which he stated, also, that the specimen referred to was destroyed in the fire that consumed his museum at Palm Beach in the late nineties.

HAUNTS AND HABITS.—Snow Buntings in winter occur in flocks along the sea beaches and on barren tracts near the coast. Their notes are said to be characteristic—"a peculiar rolling twitter or whistle" (Barrows).

HYPOTHETICAL LIST

The following species have been accredited to the State on what seems to be insufficient evidence.

WANDERING ALBATROSS: *Diomédea éxulans* Linnaeus

The Wandering Albatross ranges widely over all the southern oceans. A bird believed to be of this species was seen by Alfred Ames Howlett at the mouth of the St. Johns River in May, 1885. Mr. Howlett describes his observation as follows (Coues, 1885, p. 387):

"I was in the pilot-house of my tug, the 'J. E. Stevens,' talking with Captain N. Broward, when I discovered a large bird hovering near the surface of the water in the channel near 'Ward's Bank,' and on coming nearer the bird arose and circled within seventy-five yards of the tug, and I *positively identified* it as an Albatross; and on the return of the tug I carried my gun with me and, although seen again I was unable to get within shot. The last seen of the bird it was winging its way seaward. . . . I am positive of the bird's identity from mounted specimens I have seen and from ornithological works I have read."

LEACH'S PETREL: *Oceanódroma leucórhoa leucórhoa* (Vieillot)

Leach's Petrel breeds on the coasts of the north Atlantic from Maine to Greenland, and in Iceland and Great Britain; also in the north Pacific. It ranges widely over both oceans and may occasionally appear on the Florida coast. H. H. Bailey (1925a, p. 13) says the "bird can be seen off our coast in the Gulf Stream during April and September, when it is following the steamers in search of food . . ." In the absence of a specimen taken in the State, it seems best to place this species in the hypothetical list.

RED-FOOTED BOOBY: *Súla piscâtor* (Linnaeus)

This Booby inhabits the tropical and subtropical oceans, breeding northward to the West Indies. It is doubtfully recorded from the ocean beach opposite Micco by Outram Bangs (1902, p. 395), who observed large numbers fishing in the surf during the severe storm of February 16, 1895. Bartsch's records of this species from the Tortugas (1919, p. 492; 1920, p. 205) are based on a misidentification, the birds that were supposed to be Red-footed Boobies really being Blue-faced Boobies (see p. 87).

CUBAN SPARROW HAWK: *Fâlco sparverioídes* (Vigors)

The Cuban Sparrow Hawk has been included in the list of North American birds on the strength of a single doubtful record, published by Ridgway (1880c, p. 220), as follows: "There is a male of this species in my collection said to have been obtained in Florida. It was found with a collection of Florida birds, forming part of a dealer's stock, and was evidently the same 'make' of skin as the rest of the lot." The evidence that this specimen was taken in Florida is too indefinite to warrant the admission of the species to the State list.

ESKIMO CURLEW: *Phaéopus boreâlis* (Forster)

The Eskimo Curlew, now apparently nearing extinction, formerly bred on the Barren Grounds of Mackenzie and the Arctic coast of Alaska; it wintered in Argentina and Patagonia, and in spring migrated

northward through the Mississippi Valley; in the fall it passed south, chiefly over the ocean, from Labrador to Brazil, occasionally landing on the coasts of Massachusetts, Long Island, or New Jersey. Scott (1892b, p. 212) lists the species as a migrant in the Caloosahatchee Valley, but this is almost certainly an error.

FRANKLIN'S GULL: *Lárus pipixcan* Wagler

Franklin's Gull is an inhabitant of the prairie regions of southern Canada and northern United States south to northern Utah and northern Iowa. In winter most of the birds migrate to the west coast of South America, but a few remain in the Gulf of Mexico. There are casual or accidental records from Pennsylvania, Virginia, and the West Indies. The only Florida record is by Clifford H. Pangburn (1919, p. 395) at St. Petersburg, who says: "I saw one Franklin's Gull on February 26 [1918]. It was in company with several other species at the mouth of a sewer where I watched it for half an hour or more with an eight diameter glass, often being within twenty-five feet." While this identification is probably correct, it seems best to omit the species from the State list until a specimen is taken.

BLUE-HEADED QUAIL-DOVE: *Starnoénas cyanocéphala* (Linnaeus)

The home of this Quail Dove is in Cuba and Isle of Pines; the bird has been accredited to Florida on the strength of Audubon's record of a pair seen by him on Key West in May, 1832 (1834, vol. 2, p. 411). In addition to these two birds which, as he says, ran back into the thickets on his approach, he saw a pair alleged to have been taken on the Mule Keys and kept in captivity. Since the species has never been observed by other naturalists, and there is a possibility that Audubon was mistaken in the bird's identity, it seems best to exclude the species from the State list.

GREEN PAROQUET: *Aratínga holochlóra holochlóra* (Sclater)

This bird is about the size of the Carolina Paroquet, and resembles it in color, but is solid green, without red or yellow markings. Its range is in eastern Mexico and Guatemala. The presence of a flock of about a dozen of these Paroquets on the edge of the Everglades west of Palm Beach and Lake Worth is recorded by Thomas Barbour (1925, p. 132). The birds were reported to be extremely shy and wild, and feeding on the cones of tall cypress trees. The single specimen obtained was identified by Outram Bangs. H. H. Bailey (1928a, p. 216) states, however, that this bird was alone when killed, in the back yard of a farm house, near the waterworks west of Miami, and that it was one of several that had been brought from Mexico and later escaped from captivity.

ARCTIC THREE-TOED WOODPECKER: *Picoídes árcticus* (Swainson)

Oberholser (1918e, p. 479) has published a record of a specimen alleged to have been taken near Mayport, Florida, March 20, 1875, by J. D. Allen, a taxidermist, of Mandan, North Dakota. The specimen in question bears no label (so Doctor Oberholser states), and the authenticity of the record depends entirely on Mr. Allen's memory. Since there is a possibility of error, and as the species is not otherwise known to occur south of Ohio and Connecticut, it seems advisable to omit the bird from the State list.

LEAST FLYCATCHER: *Empídonax mínimus* (Baird)

The Least Flycatcher breeds from west central Mackenzie and southern Quebec south to northern New Jersey, and in the mountains to North Carolina. It winters from northern Mexico to Panama and Peru, and occurs in migration throughout the Eastern United States. J. A. Allen (1871, p. 300), on the authority of G. W. Boardman, states that the Least Fycatcher "becomes common [in eastern Florida] the last week in March." The bird is likely to occur in migration in the State, but until a specimen is obtained, Boardman's record must remain questionable.

BELL'S VIREO: *Vireo bélli bélli* Audubon

Bell's Vireo breeds from northeastern Colorado, southern South Dakota, northern Illinois, and northern Indiana south to eastern Texas and Tamaulipas. It winters in Mexico and Guatemala, and has occurred accidentally in New Hampshire. H. H. Bailey (1925a, p. 120) has published a record of this species, a bird said to have been taken by A. H. Helme at Cedar Keys, in February, 1905. Regarding this, Mr. Helme writes me that he observed the bird many times within a few feet, but *did not* collect it. He says: "For several days it frequented a small thicket of shrubs in the heart of the town. It could be found, often singing, at almost any time during its stay. I feel confident of its identity." Although it is probable that the bird was correctly identified, it seems best to leave the species in the hypothetical list until a specimen is collected.

PHILADELPHIA VIREO: *Vireo philadélphicus* (Cassin)

The Philadelphia Vireo breeds from northern Alberta, central Manitoba, northern Ontario, and New Brunswick to northern Michigan and New Hampshire. It winters from Cozumel Island and Guatemala to Veragua. This species is known in Florida only from two sight records at Pensacola—April 18 and 19, 1919, and October 6, 1926. Both of these were made by F. M. Weston, who had the birds under observation at close range with field glasses for quite a period. He noted particularly that the birds had a decided wash of yellow on the breast. Mr. Weston's long experience as an observer being considered, there would seem to be little doubt as to the correctness of his identifications, but until a specimen can be obtained, it seems best to keep the species in the hypothetical list.

BIBLIOGRAPHY OF FLORIDA ORNITHOLOGY

AND REFERENCES TO OTHER LITERATURE[1]

ANONYMOUS

1874. How does the young bird peck out of the shell?: Amer. Sportsman, vol. 5, p. 3, October 3.
Note on hatching process of eggs of the Roseate Spoonbill near Lake Okeechobee.

1888. [Destruction of Herons for their plumes]: Auk, vol. 5, p. 128, January.
Letter written to W. E. D. Scott relative to killing of plume birds in the vicinity of Punta Rassa, Fla.

1913. The Robin question in Florida: Amer. Field, vol. 79, p. 222, March 8.
Robins said to be destructive to strawberries.

1925. Birds that breed in Florida: Florida Quart. Bul., Dept. of Agr., pp. 17–21, October.
A nominal list of 146 species compiled in the U. S. Biological Survey.

1929. List of Florida birds: Florida Woods and Waters, vol. 1, no. 1, pp. 39–41.
A nominal list of 423 forms said to be compiled from Chapman's "Key," Bailey's "Birds of Florida," and Phillips's "Ducks of the World."

"A., F.A."

1894. In Florida flat woods: Forest and Stream, vol. 42, p. 380, May 5.
Mention of flocks of Paroquets seen on the St. Sebastian River.

ADAMS, CHARLES CHRISTOPHER

1904. The migration route of Kirtland's Warbler: Bul. Michigan Orn. Club, vol. 5, pp. 14–21, March.
Contains records of the bird from West Jupiter, Fla.

AINSWORTH, SARAH F. (Mrs. Henry A.) [see, also, Beach and Ainsworth, and Tickenor and Ainsworth.]

1904. The Christmas bird census: Bird-Lore, vol. 6, p. 14, February.
Record of 13 species observed at Miami, December 26, 1903.

1910. Bird-Lore's tenth Christmas census: Bird-Lore, vol. 12, pp. 29–30, February.
Record of 27 species observed at Daytona Beach, December 26, 1909.

1912. Bird-Lore's twelfth Christmas bird census: Bird-Lore, vol. 14, p. 32, February.
Records of 40 species seen at Daytona Beach, December 24, 1911.

1917. Bird-Lore's seventeenth Christmas census: Bird-Lore, vol. 19, p. 29, February.
Records of 36 species observed at Daytona Beach, December 26, 1916.

AINSWORTH, MRS. HENRY A., AND R. J. LONGSTREET

1924. The Birds of Volusia County, Florida: Bul. no. 2, Halifax River Bird Club, Daytona Beach, 14 pp., February.
Annotated list of 204 species.

"AL. I. GATOR" (see Le Baron, J. F.)

ALLEN, ARTHUR AUGUSTUS

1924. Vacationing with birds: Bird-Lore, vol. 26, pp. 208–213, June.
Mentions seeing Ivory-billed Woodpeckers in Florida in 1924.

1926. Birds as pets: Bird-Lore, vol. 28, pp. 225–233, June.
Contains photograph of a captive Florida Burrowing Owl.

ALLEN, CHARLES SLOVER

1891. [Florida bird notes]: Abstr. Proc. Linn. Soc. New York, no. 3, pp. 2–3 (read May 16, 1890).
Mentions taking of an Ivory-billed Woodpecker and 40 specimens of Bachman's Warbler on the Suwannee River.

[1] Citations without annotations do not refer specifically to Florida birds.

1893. [Breeding habits of the Brown Pelican]: Abstr. Proc. Linn. Soc. New York, no. 5, pp. 9–10 (presented December 7, 1892).
Observations made near Micco, Fla.

ALLEN, GLOVER MORRILL

1905. Summer birds in the Bahamas: Auk, vol. 22, pp. 113–133, April.

ALLEN, JOEL ASAPH

1871. On the mammals and winter birds of East Florida, with an examination of certain assumed specific characters in birds, and a sketch of the bird-faunae of eastern North America: Bul. Mus. Comp. Zool., vol. 2, pp. 161–450, April.
Contains list of 183 species, with extended annotations and tables of measurements; also definition of the faunal areas of eastern North America, with lists of birds characterizing the areas.

1872a. [Remarks concerning geographical variation in mammals and birds]: Proc. Boston Soc. Nat. Hist., vol. 15, pp. 156–159, April 17.
Remarks on characters shown by the Sparrow Hawks of southern Florida.

1872b. List of birds observed in the vicinity of Fort Hays, Kansas, from May 26 to July 3, 1871; with annotations: Bul. Mus. Comp. Zool., vol. 3, pp. 131–142.
Contains remarks on Florida specimens of the Grasshopper Sparrow.

1880. Destruction of birds by light-houses: Bul. Nuttall Orn. Club, vol. 5, pp. 131–138, July.
Reports large numbers of birds killed by striking St. Augustine Light.

1888a. Descriptions of two new subspecies of the Seaside Sparrow (*Ammodramus maritimus*): Auk, vol. 5, pp. 284–287, July.
Original descriptions of *Ammodramus maritimus peninsulae* and *A. maritimus sennetti*.

1888b. Further notes on Seaside Sparrows: Auk, vol. 5, p. 426, October.
Record of a specimen of *Ammodramus maritimus peninsulae* taken at Cedar Keys.

1892a. The North American species of the genus *Colaptes*, considered with special reference to the relationships of *C. auratus* and *C. cafer:* Bul. Amer. Mus. Nat. Hist., vol. 4, pp. 21–44, February.
Contains measurements of 20 specimens of *Colaptes auratus* from Florida.

1892b. The geographical distribution of North American mammals: Bul. Amer. Mus. Nat. Hist., vol. 4, pp. 199–244, December 29.
Systematic studies of the faunal areas of North America.

1909a. The habitat groups of North American birds in the American Museum of Natural History: Auk, vol. 26, pp. 165–174, April.
Contains descriptions of several groups based on Florida specimens.

1909b. Review of "The behavior of Noddy and Sooty Terns," by John B. Watson: Auk, vol. 26, pp. 209–214, April.

1916. Autobiographical notes and a bibliography of the scientific publications of Joel Asaph Allen: Amer. Mus. Nat. Hist. (New York), 215 pp.
Contains an account of Doctor Allen's Florida trip in 1868–69.

ALLEN, JOEL ASAPH, AND WILLIAM BREWSTER

1883. Lists of birds observed in the vicinity of Colorado Springs, Colorado, during March, April, and May, 1882: Bul. Nuttall Orn. Club, vol. 8, pp. 151–161, July.
Helminthophila celata obscura Ridgway reinstated, with record of a specimen from Mellonville, Fla.

ANDERSON, BUELL

1913. Passenger Pigeons in Florida: Amer. Field, vol. 79, p. 343, April 12.
Author claims to have seen a flock of about 25 "long-tailed pigeons" between Jacksonville and Tallahassee "about a year ago."

ARTHUR, STANLEY CLISBY

1921. The feeding habits of the Black Skimmer: Auk, vol. 38, pp. 567–574, plates 20 and 21, October.

ATKINS, JOHN WYLEY

1899. *Columba corensis* at Key West, Florida: Auk, vol. 16, p. 272, July.
Record of a specimen of the Scaled Pigeon taken at Key West—the first United States record.

AUDUBON, JOHN JAMES

1831–1839. Ornithological biography, or an account of the habits of the birds of the United States of America [etc.]: Vol. 1, March, 1831, xxiv + 512 pp.; vol. 2, December, 1834, xxxii + 588 pp.; vol. 3, December, 1835 [=1836], xvi + 638 pp.; vol. 4, November, 1838, xxiv + 618 pp.; vol. 5, May, 1839, xxxix + 664 pp.
Contains many notes on Florida birds, descriptions of Florida scenery, and anecdotes of the author's experiences.

1832a. [Letter to the editor]: Monthly Amer. Journ. of Geol. and Nat. Sci., vol. 1, pp. 358–363, February.
Letter dated "St. Augustine, East Florida, December 7, 1831," describing his experiences en route from Charleston to St. Augustine; brief mention of a few birds.

1832b. [Letter to the editor]: Monthly Amer. Journ. of Geol. and Nat. Sci., vol. 1, pp. 407–414, March.
Letter dated, "Bulowville, East Florida, December 31, 1831"; describes his experiences at Bulowville and vicinity.

1832c. [Letter to the editor]: Monthly Amer. Journ. of Geol. and Nat. Sci., vol. 1, pp. 529–537, June.
Letter (not dated) describes his experiences on a trip from Bulowville to Spring Garden Creek and Dexter Lake; mention of a few birds, including a pair of ibises believed to be a new species.

AUDUBON, JOHN JAMES, AND FRANCIS HOBART HERRICK

1926. Delineations of American scenery and character. xix + 349 pp.
Republication of Audubon's "Episodes" and preface, from his "Ornithological Biography."

AUDUBON, MARIA REBECCA

1897. Audubon and his journals. Vol. 1, 532 pp.; vol. 2, 554 pp.
A number of the "Episodes" (in vol. 2) contain anecdotes of Audubon's experiences in the St. Johns River region and among the Florida Keys. Illustrated with zoological and other notes by Elliott Coues.

BAGG, EGBERT

1889. A series of Florida eggs of the Bald Eagle: Orn. and Ool., vol. 14, pp. 73–74, May.
Measurements of 26 sets taken in the Indian River region.

BAILEY, ALFRED MARSHALL

1928. A study of the Snowy Herons of the United States: Auk, vol. 45, pp. 430–440, plates 13–15, October.
Contains measurements of many specimens from Florida.

BAILEY, FLORENCE MERRIAM

1902. Handbook of birds of the Western United States. Rev. ed., li + 570 pp., illus., 1914.

1928. Birds of New Mexico: New Mexico Dept. of Game and Fish. xxiv + 807 pp., 79 plates, 136 text figs., 60 maps.

BAILEY, HAROLD HARRIS

1921. "Congratulations, brother Bailey": Oologist, vol. 38, p. 129, October.
Letter to the editor, describing discovery of nest and eggs of the Cape Sable Seaside Sparrow.

1922a. New addition to A. O. U. Check List of North American Birds: Oologist, vol. 39, p. 91, June.
Mentions capture of a Ringed Turtle Dove (*Streptopelia risoria*) in Dade County, Fla.

1922b. Flight of birds: Oologist, vol. 39, p. 157, November.
Data on speed of certain birds, obtained in Florida.

1922c. Owl food: Oologist, vol. 39, p. 164, November.
Notes on habits of Florida Screech Owl and Florida Burrowing Owl.

1923a. Notes on the Florida Burrowing Owl: Wilson Bul., vol. 35, p. 117, June.
Specimens from Miami Beach are much darker than those from Okeechobee.

1923b. A new dove from Florida—*Zenaidura macroura peninsulari* (Florida Mourning Dove): Wilson Bul., vol. 35, p. 100, June.
Original description; type from Miami Beach.

1923c. The status of the Florida Crow (*Corvus brachyrhynchos pascuus*): Wilson Bul., vol. 35, pp. 148–149, September.
Considers the subspecies *pascuus* unworthy of recognition.

1924. The Florida Jay: Oologist, vol. 41, p. 20, February.
Notes on nesting of the Florida Jay and the Little Sparrow Hawk.

1925a. The birds of Florida: 4to, 146 pp., 76 colored plates.
Lists 425 species and subspecies from the State, with brief accounts of their habits.

1925b. The Scissor-tailed Flycatcher in Florida: Wilson Bul., vol. 37, pp. 94–95, June.
Records capture of a specimen at Fulford, Dade County, December 14, 1924.

1926. The Prairie Warbler in south Florida: Bailey Mus. Nat. Hist., Bul. no. 3 (Miami, Fla.), November 16, 1926.
Original description of *Dendroica discolor collinsi;* type No. 1875, "B. C. N. H." [no type locality mentioned].

1927a. The Ivory-billed Woodpecker in Florida: Oologist, vol. 44, pp. 18–20, February.
States that the record of the Ivory-bill nesting in Royal Palm Hammock is an error.

1927b. An albino Florida Grackle: Oologist, vol. 44, pp. 118–119, September.
Specimen taken near Miami.

1927c. Data concerning the breeding range of certain marsh birds: Wilson Bul., vol. 39, pp. 175–176, September.
Notes on nesting of Glossy Ibis, Virginia Rail, Black Rail, and American Coot in Florida.

1927d. Florida bird notes: Oologist, vol. 44, pp. 137–138, October.
Notes on a Duck Hawk catching pigeons at Miami.

1927e. Modern bird homes in south Florida: Oologist, vol. 44, p. 146, November.
Notes on Sparrow Hawks, Flickers, and Burrowing Owls.

1927f. South Florida bird notes: Oologist, vol. 44, pp. 154–155, November.
Notes on the effects of the 1926 hurricanes on birds.

1928a. "An ornithological enigma" explained: Auk, vol. 45, pp. 216–217, April.
States that the paroquet [*Aratinga holochlora*] recorded by Barbour (Auk, vol. 42, p. 132, 1925) was one of 4 or 5 that escaped from captivity.

1928b. Who banded this bird?: Wilson Bul., vol. 40, pp. 112–113, June.
Record of a banded Marsh Hawk killed in Broward County—apparently a Minnesota bird.

1928c. The Arkansas Kingbird in Florida: Wilson Bul., vol. 40, p. 113, June.
Record of a specimen of *Tyrannus verticalis* killed near Miami, November 19, 1927.

1928d. More Arkansas Kingbirds in Florida: Wilson Bul., vol. 40, pp. 113–114, June.
Record of a specimen of *Tyrannus verticalis* near Miami, January 15, 1928.

1928e. Regarding a late Florida record of the Flamingo: Wilson Bul., vol. 40, p. 197, September.
Suggests that the Flamingo seen by Stoddard at Wakulla Beach in September, 1927, was a bird that had escaped from Edward Bok's preserve at Lake Wales.

1928f. Why a new Florida Blue Jay?: Wilson Bul., vol. 40, p. 254, December.
Considers the Blue Jay named by Todd [*Cyanocitta cristata semplei*] not recognizable.

1929a. An unusual set of the Anhinga: Oologist, vol. 46, p. 60, April.
Record of a set of 8 eggs found in southern Florida.

1929b. The status of certain east coast Red-wing Blackbirds: Wilson Bul., vol. 41, pp. 192–193, September.
Claims that *Agelaius phoeniceus bryanti* breeds in southern Florida.

1930a. Concerning the Bald Eagle (*Haliaeetus l. leucocephalus*): Oologist, vol. 47, pp. 10–11, January.
Account of finding an Eagle's nest on a mangrove key in southern Florida. [Reprinted in November number, pp. 137–138.]

BAILEY, HAROLD HARRIS (Continued)

1930b. Record of the early laying of the Osprey in Florida: Oologist, vol. 47, p. 20, February.
Eggs found on a mangrove key in Florida Bay, December 11, 1927. [Reprinted in the October number, p. 120.]

1930c. The White Ibis: Bailey Mus. and Libr. Nat. Hist. [Miami, Fla.], Bul. 4, April 1.
The "long-billed White Ibis" named *Guara alba longirostris* (no type mentioned).

1930d. The Bald Eagle: Bailey Mus. and Libr. Nat. Hist. [Miami, Fla.], Bul. 4, April 1.
The eagles of the lower Florida peninsula named *Haliaeetus floridana* (no type mentioned).

1931a. Wild Flamingoes in Florida: Oologist, vol. 48, p. 67, May.
Mention of a flock of 14 birds photographed by G. W. Romer in the Everglades, and of smaller numbers seen on the Keys, in 1931.

1931b. Swainson's Hawks in Florida: Bailey Mus. and Libr. Nat. Hist., Bul. 6, June 15.
Records of specimens taken at Miami and Key West.

1931c. An unusual set of Wilson's Plover: Bailey Mus. and Libr. Nat. Hist., Bul. 6, June 15.
Set of 5 eggs recorded from Florida.

1931d. Audubon's and Sooty Shearwaters in Florida: Bailey Mus. and Libr. Nat. Hist., Bul. 6, June 15.
Records of two specimens of Audubon's Shearwater and one of the Sooty Shearwater taken off the coast at Miami.

1931e. The Florida Burrowing Owl: Bailey Mus. and Libr. Nat. Hist., Bul. 6, June 15.
Nesting habits described.

1931f. Some types of nests of the Black-necked Stilt in Florida: Wilson Bul., vol. 43, pp. 226–227, 1 pl., September.
Contains records of breeding on Biscayne Bay and other places.

BAILEY, HARRY BALCH

1884. Breeding habits of the Everglade Kite: Auk, vol. 1, p. 95, January.
Description of nests and eggs found in the Everglades.

[BAILEY, MERRITT P.]

1928. [Photographs of Bald Eagle's nest and of young Barn Owls near Miami]: Oologist, vol. 45, pp. 114, 115, August.

BAIRD, SPENCER FULLERTON

1852. List of birds inhabiting America west of the Mississippi, not described in Audubon's ornithology: Explor. and Surv. Great Salt Lake by Howard Stansbury; Senate Doc. No. 3, Special Session, March, 1851, pp. 327–335.
Contains also mention of a few species recently recorded from Florida, including *Rostrhamus sociabilis*, *Vireosylva altiloqua* [=*V. calidris barbatula*], *Procellaria meridionalis*, and *Thalassidroma fregetta* [=*Fregetta grallaria*].

1860. Birds of North America: 4to, lvi + 1005 pp., 100 plates.
Contains (p. 924) record of capture of the Bahama Honey Creeper at Indian Key, Fla.

1866. The distribution and migrations of North American birds: Amer. Journ. Sci. and Arts, vol. 41, pp. 78–90, 184–192, 337–347.
Records [p. 84] of occurrence in Florida of *Certhiola bahamensis*, *Progne cryptoleuca*, *Vireo barbatula*, and *Quiscalus aglaeus* (original use of the name).

BAIRD, S. F., THOMAS MAYO BREWER, AND ROBERT RIDGWAY

1874. A history of North American birds. Land Birds: Vol. 1, xxviii + 596 pp.; vol. 2, 590 pp.; vol. 3, xxviii + 560 pp.; 64 plates.
Contains original description of *Helminthophila celata obscura*, type from Enterprise, Fla.

1884. Water birds of North America: Vol. 1, xi + 537 pp.; vol. 2, 552 pp.
Contains many Florida notes from N. B. Moore and others.

BAIRD, S. F., JOHN CASSIN, AND GEORGE NEWBOLD LAWRENCE

1858. Explorations and surveys for a railroad route from the Mississippi River to the Pacific Ocean: Pacific R. R. Reports, vol. 9, lvi + 1005 pp.
Contains many Florida records, and original descriptions of *Ardea würdemannii*, from southern Florida, and of *Mniotilta varia longirostris*, type from Cape Florida.

BAKER, FRANK COLLINS

1889. Contents of the stomachs of certain birds collected in Brevard County, Florida, between January 5 and April 15: Orn. and Ool., vol. 14, pp. 139–140, September.
Records of 52 species.

1890. Notes on the food of birds. Proc. Acad. Nat. Sci. Philadelphia, 1889 [1890], pp. 266–270.
Records of stomach examinations of 40 species, taken at Micco, Fla.

BAKER, MARY F.

1930. Brown Thrashers: Florida Naturalist, vol. 3, p. 105, July.
Nesting at Winter Park.

BANGS, OUTRAM (see also, Thayer and Bangs)

1898. Some new races of birds from eastern North America: Auk, vol. 15, pp. 173–183, April.
Contains original descriptions of *Myiarchus crinitus boreus*, *Tyrannus tyrannus vexator*, *Sitta pusilla caniceps*, *Parus bicolor floridanus*, and *Sialia sialis grata*, with numerous Florida records.

1899. The Florida Meadowlark: Proc. New England Zool. Club, vol. 1, pp. 19–21, February 28.
Original description of *Sturnella magna argutula*, type from Dunedin, Fla.

1901. On an apparently unnamed race of *Buteo borealis:* Proc. New England Zool. Club, vol. 2, pp. 67–69, July 31.
Original description of *Buteo borealis umbrinus;* type from Miakka, Fla.

1902a. A new Long-billed Marsh Wren from eastern North America: Auk, vol. 19, pp. 349–353, October.
A revision of the eastern marsh wrens; *Cistothorus* [*Telmatodytes*] *griseus* said to breed from the coast of South Carolina to Matanzas Inlet, Florida, and *C. marianae* on the west coast of Florida.

1902b. The occurrence of boobies in numbers on the east coast of Florida during a storm: Auk, vol. 19, pp. 395–396, October.
Record of the White-bellied Booby, and of another species thought to be *Sula piscator*, at Oak Lodge, opposite Micco.

1903. A new race of the Carolina Chickadee from southern Florida: Proc. New England Zool. Club, vol. 4, pp. 1–2, March 16.
Original description of *Parus carolinensis impiger;* type from Lake Ashby, Fla.

1912. The Florida Song Sparrow: Proc. New England Zool. Club, vol. 4, pp. 85–87, June 5.
Original description of *Melospiza melodia beata;* type from Enterprise, Fla.

1915a. The American forms of *Gallinula chloropus* (Linn.): Proc. New England Zool. Club, vol. 5, pp. 93–99, May 17.
Contains original description of *Gallinula chloropus cachinnans;* type from Arbuckle Creek, De Soto County, Fla.

1915b. Notes on dichromatic herons and hawks: Auk, vol. 32, pp. 481–484, October.
Considers the Great White Heron a color phase of *Ardea herodias*, and proposes to call both it and Ward's Heron, *Ardea herodias occidentalis*.

1918. Notes on the species and subspecies of *Paecilonitta* Eyton: Proc. New England Zool. Club, vol. 6, pp. 87–89, October 31.
Contains record of a specimen of the Bahama Pintail from Cape Canaveral.

1920. A new Red-shouldered Hawk from the Florida Keys: Proc. New England Zool. Club, vol. 7, p. 35, January 16.
Original description of *Buteo lineatus extimus;* type from Cape Florida.

BANGS, OUTRAM (Continued)

1930a. Types of birds now in the Museum of Comparative Zoology: Bul. Mus. Comp. Zool., vol. 70, pp. 147–426, March.
Lists numerous types from Florida, with critical notes.

1930b. The Screech Owls of eastern North America: Auk, vol. 47, pp. 403–404, July.
Otus asio floridanus (Ridgway) considered separable from *Otus asio asio;* type locality, Indian River, Fla.; range, peninsular Florida.

BANGS, O., AND G. K. NOBLE

1918. List of birds collected on the Harvard Peruvian Expedition of 1916: Auk, vol. 35, pp. 442–463, October.
Polyborus cheriway audubonì Cassin proposed for the Florida form, based on Audubon's specimen in Acad. Nat. Sci. Philadelphia.

BANGS, O., AND T. E. PENARD

1920. Two new American hawks: Proc. New England Zool. Club, vol. 7, pp. 45–47, February 19.
Contains original description of *Elanus leucurus majusculus* and records of its occurrence in Osceola County, Fla.

BANGS, O., AND WALTER REAVES ZAPPEY

1905. Birds of the Isle of Pines: Amer. Nat., vol. 39, pp. 179–215.

BARBOUR, THOMAS

1925. An ornithological enigma: Auk, vol. 42, p. 132, January.
Record of capture of a specimen of a green paroquet, *Aratinga holochlora holochlora*, near Palm Beach.

BARLOW, CHESTER

1897. Some notes on the nesting habits of the White-tailed Kite: Auk, vol. 14, pp. 14–21, January.

BARNES, RICHARD MAGOON

1910. The Limpkin (*Aramus vociferus*): Oologist, vol. 27, p. 151, December 15.
Brief account of habits.

BARRETT, CHARLES D.

1885. The Ivory-billed Woodpecker: Forest and Stream, vol. 24, p. 508.

BARROWS, WALTER BRADFORD

1889a. The food of Crows: U. S. Dept. Agr., Ann. Rept. of the Ornithologist and Mammalogist for 1888, pp. 498–535.

1889b. The English Sparrow (*Passer domesticus*) in North America, especially in its relations to agriculture: U. S. Dept. Agr., Bul. 1, Div. Econ. Orn. and Mamm., 405 pp.
Contains records of the English Sparrow from four localities in Florida.

1912. Michigan bird life: Michigan Agr. College, vii + 822 pp.

BARTON, BENJAMIN SMITH

1799. Fragments of the natural history of Pennsylvania. 4to., xviii + 24 pp.
Contains a number of records of Florida birds.

1818. Some account of the *Tantalus ephouskyca*, a rare American bird: Trans. Linn. Soc. London, vol. 12, pt. 1, pp. 24–27, pl. 1 (read June 6, 1815).
Quotation from Bartram's account of the Limpkin, with a figure of the bird; a new name proposed, based on the Indian name, "Ephouskyca."

BARTRAM, WILLIAM

1791. Travels through North and South Carolina, Georgia, East and West Florida, the Cherokee Country, the extensive Territories of the Muscogulges, or Creek Confederacy, and the country of the Choctaws; containing an account of the soil and natural productions of those regions, together with observations on the manners of the Indians. xxiv + 522 pp.
Contains extended accounts of many birds and descriptions of several new species (see p. 8).

BARTSCH, PAUL

1914a. Mourning Warbler (*Oporornis philadelphia*) in Florida: Auk, vol. 31, p. 103, January, 1914.
Record of a bird seen on Sands Key.

1914b. Birds observed on the Florida Keys from April 25 to May 9, 1913: Carnegie Inst. Washington, Yearbook for 1913 (no. 12), pp. 172–175, January.
Notes on 57 species.

1915. Birds observed on the Florida Keys from April 20 to April 30, 1914: Carnegie Inst. Washington, Yearbook for 1914 (no. 13), pp. 192–196, February.
Notes on 47 species.

1916. Birds observed on the Florida Keys and along the railroad of the mainland from Key Largo to Miami, June 17–July 1, 1915: Carnegie Inst. Washington, Yearbook for 1915 (no. 14), pp. 197–199, January.
Notes on 38 species.

1917a. Relationship of Florida herons: Auk, vol. 34, p. 86, January.
Ardea occidentalis considered a distinct species.

1917b. Birds observed in 1916, in the region of Miami and the Florida Keys from May 15 to June 4, and along the railroad from Key West to Miami on June 24: Carnegie Inst. Washington, Yearbook for 1916 (no. 15), pp. 182–188, February.
Notes on 54 species.

1918. Fifth annual list of birds observed on the Florida Keys: Carnegie Inst. Washington, Yearbook for 1917 (no. 16), pp. 170–172, February.
Notes on 35 species observed, July 14–August 1, 1917.

1919. The bird rookeries of the Tortugas: Smithsonian Rept. for 1917, pp. 469–500, plates 1–38.
Contains a list of 128 species recorded from the islands, with extensive notes on habits of certain species.

1920. Birds observed on the Florida Keys and the southern end of the mainland of Florida in 1919: Carnegie Inst. Washington, Yearbook for 1919 (no. 18), pp. 205–210, March.
Notes on 97 species observed, January 1–22 and May 2–19.

BATCHELDER, CHARLES FOSTER

1881. The Bald Eagle (*Haliaëtus leucocephalus*) as a hunter: Bul. Nuttall Orn. Club, vol. 6, pp. 58–60, January.
Account of an eagle capturing Coots on the St. Johns River.

BAYNARD, OSCAR EDWARD (see also Mounts and Baynard)

1909a. Echoes from Florida: Oologist, vol. 26, pp. 5–7, January.
Description of nests of Black Vulture, Ivory-billed Woodpecker, Pileated Woodpecker, Florida Turkey, Purple Gallinule, etc.

1909b. Notes from Florida on *Catharista urubu:* Oologist, vol. 26, pp. 191–193, November 15.
Full account of nesting habits; 200 nests examined.

1909c. Nesting of Florida Wren: Oologist, vol. 26, pp. 213–215.
Sixty nests found in Florida.

1910a. Additional notes on the breeding of *Catharista urubu:* Oologist, vol. 27, p. 106, September 15.
Description of a nest with eggs, 85 feet up in a cypress tree.

1910b. Runt set of *Catharista urubu:* Oologist, vol. 27, p. 112, September 15.
Taken in Florida, February 28, 1909.

1911a. A list of birds found on Bird Island in Orange Lake: Oologist, vol. 28, p. 14, January 15.
21 species listed, with estimates of numbers.

1911b. Louisiana Heron on nest on Bird Island, Florida [photo]: Oologist, vol. 28, p. 105, June 15.

1911c. American Egret feeding young, Orange Lake, Florida, rookery [photo]: Bird-Lore, vol. 13, p. 332, December.

1912a. Food of herons and ibises: Wilson Bul., vol. 24, pp. 167–169, December.
Records of stomach examinations of Glossy Ibis, White Ibis, Snowy Egret, Water-Turkey, and several species of herons, made at Orange Lake.

1912b. Young American Egret, Orange Lake, Florida, rookery [photo]: Bird-Lore, vol. 14, p. 382, December.

1913a. Breeding birds of Alachua County, Florida: Auk, vol. 30, pp. 240–247, April.
Annotated list of 98 species.

BAYNARD, OSCAR EDWARD (Continued)

1913b. Home life of the Glossy Ibis (*Plegadis autumnalis* Linn.): Wilson Bul., vol. 25, pp. 103–117, 9 plates, September.
A full account of the nesting and feeding habits, as observed at Orange Lake, Fla.

1913c.–1914a. Two months in the Everglades: Oologist, vol. 30, pp. 287–294, December 15, 1913; vol. 31, pp. 32–40, February 15, 1914.
Notes on breeding habits of Wood Ibis, Florida Crane, Florida Burrowing Owl, Florida Cormorant, etc., at Lake Okeechobee.

1914b. The Dusky Seaside Sparrow: Oologist, vol. 31, pp. 130–134, 2 photos, July.
Description of nesting habits on Merritt Island.

1914c. Orange Lake Bird Reservation: Blue-Bird, vol. 6, pp. 275–281, 5 plates, August.
Description of the rookery, with estimates of the numbers of each species breeding there, and 5 photographs of the egrets.

1914d. Camps of an egret warden, No. 1: Blue-Bird, vol. 7, pp. 14–15, October.
Account of a Florida Turkey killed near Okeechobee Lake.

1914e. The White Ibis: Blue-Bird, vol. 7, pp. 16–22, October.
Full account of habits in Florida, with 6 photos of birds and nests.

1914f. The Black Vulture: Blue-Bird, vol. 7, pp. 48–53, November.
Full account of habits in Florida, from personal observation; photos of nest, eggs, and young birds.

1914g. Photographing birds' nests: Bird-Lore, vol. 16, pp. 471–477, December.
Illustrations and descriptions of nests of Wilson's Plover, Gray Kingbird, Black-whiskered Vireo, Swallow-tailed Kite, Everglade Kite, and Florida Turkey.

1914h. The rare Glossy Ibis in the Audubon Sanctuary at Orange Lake, Florida: Bird-Lore, vol. 16, p. 484, December.
Four photos of the birds and nests.

1914i. Christmas eve in an Eagle's nest: Blue-Bird, vol. 7, pp. 70–73, December.
Description of a nest in a tall pine in Florida.

1916. The Bald Eagle in Florida: Oologist, vol. 33, pp. 18–20, February 15.
Notes on breeding habits; 259 nests examined.

BAYNARD, OSCAR E., W. F. BLACKMAN, AND H. R. MILLS

1913. Bird-Lore's thirteenth bird census: Bird-Lore, vol. 15, p. 33, February.
Record of 34 species observed, December 25, 1912, Clearwater and Tampa to Cortez, Fla.

BEACH, SARAH A., AND MRS. H. A. AINSWORTH

1911. Bird-Lore's eleventh bird census: Bird-Lore, vol. 13, p. 34, February.
Record of 28 species observed at Daytona Beach, December 27, 1910.

BEAL, FOSTER ELLENBOROUGH LASCELLES

1898. The food of cuckoos: U. S. Dept. Agr. Biol. Survey Bul. 9, pp. 7–14.

1900. Food of the bobolink, blackbirds, and grackles: U. S. Dept. Agr. Biol. Survey Bul. 13, 77 pp.
Contains notes on food habits of the Florida Grackle and Boat-tailed Grackle in Florida.

1904. Some common birds in their relation to agriculture: U. S. Dept. Agr. Farmers' Bul. 54, (rev. ed.), 48 pp., March.

1907. Birds of California in relation to the fruit industry; part I: U. S. Dept. Agr. Biol. Survey Bul. 30, 100 pp., 5 plates.

1911. Food of the woodpeckers of the United States: U. S. Dept. Agr. Biol. Survey Bul. 37, 64 pp., 6 plates.
Contains data on the food habits of the Red-bellied Woodpecker in Florida.

1912. Food of our more important flycatchers: U. S. Dept. Agr. Biol. Survey Bul. 44, 67 pages, 5 plates, September 19.

1915a. Food of the robins and bluebirds of the United States: U. S. Dept. Agr. Bul. 171, 31 pp., February 5.

1915b. Some common birds useful to the farmer: U. S. Dept. Agr. Farmers' Bul. 630, 27 pp., February 13 (rev. ed., April, 1926).

1915c. Food habits of the thrushes of the United States: U. S. Dept. Agr. Bul. 280, 23 pp., September 27.

1918. Food habits of the swallows, a family of valuable native birds. U. S. Dept. Agr. Bul. 619, 28 pp., March 8.

1923. Common birds of southeastern United States in relation to agriculture: U. S. Dept. Agr. Farmers' Bul. 755, 14 pp., June.

BEAL, F. E. L., AND W. L. MCATEE

1912. Food of some well-known birds of forest, farm, and garden: U. S. Dept. Agr. Farmers' Bul. 506, 35 pp., September 25.

BEAL, F. E. L., W. L. MCATEE, AND E. R. KALMBACH

1916. Common birds of southeastern United States in relation to agriculture: U. S. Dept. Agr. Farmers' Bul. 755, 40 pp., October 26. (Rev. ed. November, 1927, 44 pp.)

BECKHAM, CHARLES WICKLIFFE

1882. The Black-throated Bunting in Florida: Bul. Nuttall Orn. Club, vol. 7, p. 250, October.
Record of a specimen taken at Fernandina.

BEDELL, EDGAR

1921a. Bird-Lore's twenty-first Christmas census: Bird-Lore, vol. 23, p. 21, February.
Records of 49 species seen at Miami, December 22, 1920.

1921b. The Nonpareil wintering in Florida: Auk, vol. 38, p. 460, July.
Records of the Painted Bunting and Ruby-throated Hummingbird at Miami.

BELL, R. P.

1895. Marine birds of the Gulf: Forest and Stream, vol. 44, pp. 326–327, April 27.
Habits of gulls, pelicans, etc. at St. Petersburg.

BENDIRE, CHARLES EMIL

1888. Notes on the nest and eggs of *Peucaea aestivalis bachmani* Aud., Bachman's Sparrow: Auk, vol. 5, pp. 351–356, October.
Contains description of nest and eggs taken at Gainesville, Fla.

1892a. The Bald Eagle: Forest and Stream, vol. 38, pp. 172–173, February 25.
Contains account of habits in Florida, by Dr. W. L. Ralph (advance sheets from "Life histories of North American birds").

1892b–1896. Life histories of North American birds, with especial reference to their breeding habits and eggs. U. S. Nat. Mus., Special Bul. no. 1, viii + 446 pp., 12 plates, 1892; no. 3, ix + 518 pp., 7 plates, 1895 [October, 1896].

BENNETT, FRANK MARION

1908. The eighth Christmas bird census, 1907: Bird-Lore, vol. 10, p. 33, February.
Records of 13 species observed at Warrington.

1909. A tragedy of migration: Bird-Lore, vol. 11, pp. 110–113, June.
Account of a great flight of birds at Key West and the Tortugas, April 14, 1909.

1910. Ducks increasing: Bird-Lore, vol. 12, p. 115, June.
Account of ducks seen in January, February, and March along the coasts of Florida.

BENT, ARTHUR CLEVELAND

1904. Nesting habits of the Herodiones in Florida: Auk, vol. 21, pp. 20–29, 259–270, January and April.
Observations made on the Indian River, the upper St. Johns River marshes, and the Bay of Florida.

1919. Life histories of North American diving birds: U. S. Nat. Mus. Bul. 107, xiii + 245 pp., 55 pls., August 1.
Contains numerous Florida records.

1921. Life histories of North American gulls and terns: U. S. Nat. Mus. Bul. 113, x + 345 pp., 93 pls., August 27.
Contains numerous Florida records.

BENT, ARTHUR CLEVELAND (Continued)

1922. Life histories of North American petrels and pelicans and their allies: U. S. Nat. Mus. Bul.121, xii + 343 pp., 69 pls., October 19.
Contains numerous Florida records.

1923–1925. Life histories of North American wild fowl: U. S. Nat. Mus. Bul. 126, ix + 250 pp., 46 pls., May 25, 1923; Bul. 130, x + 376 pp., 60 pls., June 27, 1925.
Contains numerous Florida records.

1927a. Life histories of North American marsh birds: U. S. Nat. Mus. Bul. 135, xii + 490 pp., 98 pls., 1926 [March 11, 1927].
Contains numerous Florida records.

1927b–1929. Life histories of North American shore birds, order Limicolae. Part 1: U. S. Nat. Mus. Bul. 142, ix + 420 pp., 55 pls., December 31, 1927; part 2, Bul. 146, ix + 412 pp., 66 pls., March 27, 1929.
Contains many references to Florida birds and their habits.

BENT, A. C., AND MANTON COPELAND

1927. Notes on Florida birds: Auk, vol. 44, pp. 371–386, July.
Annotated list of 165 species observed in central Florida, chiefly in Pinellas County.

BENT, A. C., AND HERBERT K. JOB

1904. [Letter describing a trip to Cape Sable and the upper Keys in April and May, 1903]: Auk, vol. 21, pp. 128–130, January.
Description of bird rookeries on the keys near Cape Sable, and on the adjacent mainland.

BERGER, FRANK AVERY

1928. Spring migration notes from Daytona Beach: Florida Naturalist, vol. 1, no. 4, pp. 89–90, July.
Notes on occurrences of 7 species, including a number of Connecticut Warblers.

1929. The spring migration at Daytona Beach: Florida Naturalist, vol. 2, no. 4, p. 107, July.
Records of 7 species noted in spring of 1929.

BETTLE, GRISCOM, AND LUDLOW GRISCOM (see also Griscom, Bettle, and Saltonstall).

1916. Bird-Lore's sixteenth Christmas bird census: Bird-Lore, vol. 18, p. 31, February.
Records of 61 species observed near Tallahassee, December 25, 1915.

"BEVERLY, FRED" (see Ober, F.A.)

"BIRD-LORE" (editorial)

1930. Banded Herring Gull found with beak fastened shut: Bird-Lore, vol. 32, p. 250, June.
Record of capture of a bird at Mayport, Fla., banded at Gooseberry Island, Maine.

BISHOP, LOUIS BENNETT

1901. A new Sharp-tailed Finch from North Carolina: Auk, vol. 18, pp. 269–270, July.
Original description of *Ammodramus caudacutus diversus;* type from Roanoke Island, N. C.; two specimens from Tarpon Springs, Fla., referred to the new race.

1904. The eggs and breeding habits of some comparatively little known North American birds: Abstr. Proc. Linn. Soc. New York, nos. 15–16, pp. 48–61.
Habits of the Florida Clapper Rail, Florida Redwing and Marian's Marsh Wren.

BLACKMAN, WILLIAM FREMONT (see also Baynard, Blackman, and Mills)

1930. May Day in the Big Cypress: Florida Naturalist, vol. 3, pp. 38–41, January.
Description of a trip into the Big Cypress Swamp, with mention of many birds seen.

"BLANCHAN, NELTJE" (see Doubleday, Nellie Blanchan De Graft).

BLATCHLEY, WILLIS STANLEY

1902. A nature wooing at Ormond by the sea: 238 pp.
Contains bird notes and an account of the finding of bones of the Great Auk at Ormond.

1931. My nature nook, or notes on the natural history of the vicinity of Dunedin, Florida. 302 pp.; 15 plates. Indianapolis.
Contains many original notes on the habits of birds seen on the shores of Clearwater Harbor over a period of 17 years.

BOARDMAN, GEORGE AUGUSTUS

1876. [Notes from correspondents]: Forest and Stream, vol. 6, p. 4, February 10.
White Pelicans reported numerous at mouth of St. Johns River.

1877a. [Letter from Jacksonville, Florida]: Forest and Stream, vol. 8, p. 82, March 15.
Woodcock reported abundant; notes on Wilson's Snipe diving; arrival of Purple Martin.

1877b. Where Woodcock breed: Forest and Stream, vol. 8, p. 82, March 15.
Record of young chicks of the Woodcock found in Florida.

1880. The Caspian Tern probably breeding in Florida: Bul. Nuttall Orn. Club, vol. 5, p. 64.
Records of this tern taken at Lake Jessup and in Tampa Bay.

1885. The big woodpeckers: Forest and Stream, vol. 24, p. 388.
Notes on the Ivory-billed Woodpecker and the Carolina Paroquet.

BONAPARTE, CHARLES LUCIEN

1824. An account of four species of stormy petrels: Journ. Acad. Nat. Sci. Philadelphia, vol. 3, p. 232.
Contains original description of *Procellaria wilsoni* [= *Oceanites oceanicus*]; said to breed on the east coast of Florida.

1825. Additions to the ornithology of the United States: Journ. Acad. Nat. Sci. Philadelphia, vol. 5, pp. 28–31, June.
Contains original description of *Columba zenaida* [=*Zenaida zenaida*] and of *Rallus giganteus* [= *Aramus pictus*], also record of the White-crowned Pigeon breeding on the Keys.

1826–1828a. The genera of North American birds and a synopsis of the species found within the territory of the United States; systematically arranged in orders and families: Ann. Lyc. Nat. Hist. New York, vol. 2, pp. 7–128, 293–451.
The following are recorded from Florida: *Cathartes papa*, *Corvus floridanus* [= *Aphelocoma coerulescens*], *Sylvia palmarum* [= *Dendroica palmarum*], *Columba leucocephala*, *Columba zenaida* [= *Zenaida zenaida*], *Ardea pealii* [= *Dichromanassa rufescens*], *Aramus scolopaceus* [= *Aramus pictus*], *Ibis alba* [= *Guara alba*], *Phalaropus fulicarius*, *Fuligula perspicillata* [= *Oidemia perspicillata*], *Plotus anhinga* [= *Anhinga anhinga*], *Columba rufina* (doubtful).

1827. Supplement to the genera of North American birds and to the synopsis of the species found within the territory of the United States: Zool. Journ., vol. 3, pp. 49–53.
Mention (p. 53) of the Zenaida Dove from the Florida Keys.

1828b. American Ornithology; or, the natural history of birds inhabiting the United States, not given by Wilson. Vol. 2, vii + 95 pp.; vol. 3, 60 pp.
Volume 2 contains a full account of the Florida Jay (with color plate) and a color plate of the White-tailed Kite made from a specimen taken by Peale at St. Augustine; volume 3 contains full accounts of the White-crowned Pigeon and the Zenaida Dove.

1828c. Further additions to the ornithology of the United States and observations on the nomenclature of certain species: Ann. Lyc. Nat. Hist. New York, vol. 2, pp. 154–161.
Contains original description of *Ardea pealii* [= *Dichromanassa rufescens*] from Florida.

1838. A geographical and comparative list of the birds of Europe and North America. London, 67 pp.
Includes *Glottis floridanus*, a new name based on Audubon's plate of the Greenshank taken at Sandy Key, Florida (p. 51).

1855. Coup d'oeil sur les pigeons: Comptes Rendus, des Séances de l'Acad. Sciences (Paris), vol. 40, pp. 96–102.
Contains original description of *Geotrygon chrysia*, from Florida.

BOSANQUET, LOUIS P.

1928. Florida Jay and Killdeer: Florida Naturalist, vol. 1, pp. 88–89, July.
Records of Florida Jay in Lake County, and of Killdeer nesting at Fruitland Park.

BOSC, LOUIS

1795. Descr. de deux nouvelles especes d'Animaux: Bul. Sci. Soc. Philom. Paris, vol. I, pt. 1, p. 87.
Contains original description of the Florida Jay, under the name *Corvus coerulescens*.

BOWDISH, BEECHER SCOVILLE

1909. Ornithological miscellany from Audubon wardens: Auk, vol. 26, pp. 116–128, April.
Numerous records of birds on the Florida reservations.

BOYCE, JOHN J.

1914. The struggle for existence: Condor, vol. 16, p. 260, November.
Account of a Bald Eagle robbing an Osprey of a fish on Sarasota Bay.

BRANDT, HERBERT WILLIAM

1924. The nesting of the Short-tailed Hawk: Auk, vol. 41, pp. 59–64, pl. 9, January.
Description of nest and eggs found at Lake Istokpoga.

BREWER, THOMAS MAYO (see also Baird, Brewer, and Ridgway)

1871. [Note on the Baltimore Oriole]: Proc. Boston Soc. Nat. Hist., vol. 13, p. 411.
A nest from Florida [?], composed of Spanish moss.

1875. Are Peale's Egret Heron and the Reddish Egret identical species?: Amer. Sportsman, vol. 5, pp. 294–295, February 6.
Observations of N. B. Moore in Florida indicate that these two birds are the same species.

BREWSTER, WILLIAM (see also Allen and Brewster)

1877. The Yellow-throated Warbler (*Dendroeca dominica*): Bul. Nuttall Orn. Club, vol. 2, pp. 102–106, October.
Contains several records of the bird from Florida.

1878a. Breeding of the Hooded Merganser (*Mergus cucullatus*) in Florida: Bul. Nuttall Orn. Club, vol. 3, p. 40, January.
Records of young Mergansers and young Wood Ducks on the St. Johns and Wekiva Rivers.

1878b. [Note on breeding of the Woodcock]: Bul. Nuttall Orn. Club, vol. 3, p. 151.
Record of young birds taken near Jacksonville.

1881. With the birds on a Florida river: Bul. Nuttall Orn. Club, vol. 6, pp. 38–44, January.
Account of a trip on the Wekiva River in 1877.

1882a. Impressions of some southern birds: Bul. Nuttall Orn. Club, vol. 7, pp. 94–104, April.

1882b. *Coturniculus lecontei, C. henslowi,* and *Cistothorus stellaris* in Florida: Bul. Nuttall Orn. Club, vol. 7, pp. 121–122, April.
Records of specimens taken by C. J. Maynard at Rosewood.

1883. The Scarlet Ibis in Florida: Bul. Nuttall Orn. Club, vol. 8, pp. 185–186, July.
Record of a specimen in the Charleston Museum supposed to have been taken in Florida.

1885. Swainson's Warbler: Auk, vol. 2, pp. 65–80, January.

1886a. The Bridled Tern (*Sterna anaethetus*) in South Carolina: Auk, vol. 3, p. 131, January.
Record of a specimen in the collection of George N. Lawrence labeled as from Florida.

1886b. Occurrence of the Yellow-billed Tropic Bird in Florida: Auk. vol. 3, p. 481, October.
Record of a specimen shot on the Banana River in 1886.

1886c. Breeding of the White-faced Glossy Ibis in Florida: Auk, vol. 3, pp. 481–482, October.
Record of a set of eggs and skin of the female taken at Lake Washington.

1887a. Three new forms of North American birds: Auk, vol. 4, pp. 145–149, April.
Contains original description of *Vireo noveboracensis maynardi;* type from Key West.

1887b. Capture of a third specimen of the Short-tailed Hawk (*Buteo brachyurus*) in Florida: Auk, vol. 4, p. 160, April.
Specimen taken at head of Ten Mile Creek, Brevard County, in 1886.

1889a. *Dendroica coronata* feeding on oranges: Auk, vol. 6, p. 279, July.
At Enterprise, Fla.

1889b. Nesting habits of the Parrakeet (*Conurus carolinensis*): Auk, vol. 6, pp. 336–337, October.
Account of Carolina Paroquets nesting on limbs of cypress trees (probably erroneous).

1889c. *Melanerpes carolinus* eating oranges: Auk, vol. 6, pp. 337–338, October.
At Enterprise, Fla.

1891. Notes on Bachman's Warbler (*Helminthophila bachmani*): Auk, vol. 8, pp. 149–157, April.
Extended notes on habits, as observed on the Suwannee River in March, 1890, when 46 specimens were collected.

1893a. Description of a new marsh wren, with critical notes on *Cistothorus marianae* Scott: Auk, vol. 10, pp. 215–219, July.
Original description of *Cistothorus* [= *Telmatodytes*] *palustris griseus* (type from Sapelo Island, Georgia), with numerous Florida records.

1893b. Capture of another *Ardetta neoxena* at Toronto, Ontario: Auk, vol. 10, pp. 363–364, October.
Mention of a specimen in the Brewster collection taken at Lake Flirt, Fla.

1897. The Bahaman Swallow in Florida: Auk, vol. 14, pp. 221–222, April.
Record of a specimen of *Callichelidon cyaneoviridis* taken at Tarpon Springs.

1898. *Geotrygon chrysia* again at Key West: Auk, vol. 15, p. 185, April.
Record of two specimens of the Key West Quail-Dove taken in 1897.

1899. An undescribed Clapper Rail from Georgia and east Florida: Proc. New England Zool. Club, vol. 1, pp. 49–51, June 9.
Original description of *Rallus crepitans waynei;* specimen recorded from Dummitt Creek, Indian River.

1902. Voices of a New England marsh: Bird-Lore, vol. 4, pp. 43–56, April.

1906. The birds of the Cambridge region of Massachusetts: Memoirs Nuttall Orn. Club, no. 4, pp. 1–426, July.

1907a. Concerning certain supposed instances of the occurrence of the Cinnamon Teal in Florida and South Carolina: Auk, vol. 24, pp. 154–157, April.
States that a specimen of Cinnamon Teal recorded by Scott from Key West is really the Blue-winged Teal.

1907b. Notes on the Black Rail of California: Auk, vol. 24, pp. 205–210, April.
Contains records and measurements of *Porzana jamaicensis* from Key West, Tortugas, Dade County, and Merritt Island.

1924–1925. The birds of the Lake Umbagog region of Maine: Bul. Mus. Comp. Zool., vol. 66, parts 1 and 2, pp. 1–402, June, 1924, and February, 1925.

Brewster, W., and Frank M. Chapman

1891a. Notes on the birds of the lower Suwannee River: Auk, vol. 8, pp. 125–138, April.
List of 116 species observed in March, 1890, with extended remarks on habits.

Brimley, Clement Samuel

1888. The food of some Raleigh birds: Orn. & Ool., vol. 13, p. 16, January.

1891. On the breeding habits of *Dendroica vigorsii* at Raleigh, North Carolina: Auk, vol. 8, pp. 199–200, April.

Brodhead, Mrs. Lucas

1910. Notes on birds in the Florida Keys: Bird-Lore, vol. 12, pp. 189–190, October.
Records of birds seen on Upper Matecumbe Key, January–April, 1906.

Brodkorb, Pierce

1931. Arkansas Kingbird in Florida: Auk, vol. 48, p. 270, April.
Record of two specimens taken at Miami Beach, December 2, 1922.

Brooks, Allan Cyril

1921. A twelvemonth with the shorebirds: Condor, vol. 23, pp. 151–156, September 24.
Contains records of birds seen at Jupiter and St. Lucie Inlet.

1922. The Kittiwake in Florida: Auk, vol. 39, p. 99, January.
Record of *Rissa tridactyla tridactyla* taken at Jupiter, January 24, 1921—the only Florida specimen known.

Brooks, Florence, Cyril Cockrell, Beryl T. Mounts, and Lewis H. Mounts

1929. Bird-Lore's twenty-ninth Christmas census: Bird-Lore, vol. 31, p. 44, February.
Records of 47 species observed at Zephyrhills, December 25, 1928.

1930. Bird-Lore's thirtieth Christmas Census: Bird-Lore, vol. 32, p. 44, February.
Records of 62 species seen at Zephyrhills, December 24, 1929.

Brooks, Winthrop Sprague

1913. An addition to the A. O. U. Check-List: Auk, vol. 30, pp. 110–111, January.
Record of capture of a specimen of the Bahama Pintail at Cape Canaveral.

Brooks, Winthrop Sprague (Continued)

1920. A new Clapper Rail from the Florida Keys: Proc. New England Zool. Club, vol. 7, pp. 53–54, June 24.
Original description of *Rallus longirostris insularum*, type from Big Pine Key.

Brown, Edward Johnson

1901. Florida bird notes: Auk, vol. 18, p. 199, April.
Describes a migration of White-bellied Swallows; records of Ruby-throated Hummingbird and Bonaparte's Gull at Lemon City.

Browne, A. L.

1886a. Florida bird life in November, 1885: Orn. and Ool., vol. 11, pp. 17–18, February.
Notes on 37 species seen near Orlando.

1886b. Florida birds in December, 1885: Orn. and Ool., vol. 11, p. 34, March.
Notes on 25 species seen near Orlando.

1886c. Florida birds in January, 1886: Orn. and Ool., vol. 11, pp. 50–51, April.
Notes on 24 species seen near Orlando.

1886d. Florida birds in February, 1886: Orn. and Ool., vol. 11, p. 74–75, May.
Notes on 33 species seen near Orlando.

Brownell, L. W.

1895. Peculiar sets of eggs: Nidiologist, vol. 2, p. 137, June.
Record of the Bluebird breeding at Enterprise and of the Red-bellied Woodpecker at Cape Sable.

1899. A visit to Pelican Island, on Indian River, Florida: Osprey, vol. 3, pp. 70–71, January.
Observations made in April, 1894.

Bryan, William Alanson

1903. A monograph of Marcus Island: Occasional Papers of the Bernice Pauahi Bishop Museum, vol. 2, pp. 77–124.

Bryant, Henry

1854a. [On the Sandhill Crane]: Proc. Boston Soc. Nat. Hist., vol. 4, pp. 303–307 (read February 3, 1853).
Habits and measurements of *Grus canadensis;* contends that Audubon was wrong in considering the Whooping Crane and Sandhill Crane the same.

1854b. [Birds' eggs from Florida]: Proc. Boston Soc. Nat. Hist., vol. 5, p. 43, April 19.
Record of eggs of 9 species donated by Dr. Henry Bryant.

1859a. [Birds observed in east Florida, south of St. Augustine]: Proc. Boston Soc. Nat. Hist., vol. 7, pp. 5–21 (read January 19, 1859).
Notes on 25 species.

1859b. A list of birds seen at the Bahamas, from January 20 to May 14, 1859, with descriptions of new or little known species: Proc. Boston Soc. Nat. Hist., vol. 7, pp. 102–134, September.

Burns, Franklin Lorenzo

1909. Audubon correspondence: Wilson Bul., vol. 21, pp. 103–104, June.
A letter from J. J. Audubon to Dr. Richard Harlan describing a supposed new species [= *Polyborus cheriway audubonì*] obtained by Audubon near St. Augustine.

1911. A monograph of the Broad-winged Hawk (*Buteo platypterus*): Wilson Bul., vol. 23, pp. 140–320, November.
Contains Florida records (p. 185).

Buswell, William M.

1928. Florida Jay: Florida Naturalist, vol. 1, p. 87, July.
Notes on distribution on the west coast of Florida.

1929. A day on the Gulf: Florida Naturalist, vol. 3, pp. 22–23, October.
Mention of 11 species of birds seen on an island near the mouth of the Caloosahatchee River.

BUTLER, AMOS WILLIAM

1924. A Florida Flamingo: Auk, vol. 41, pp. 150–152, January.
Record of specimen taken in Mosquito Lagoon.

1930a. Roseate Spoonbill in Florida: Auk, vol. 47, pp. 75–76, January.
Reports the birds on Mosquito Lagoon, near Oak Hill, 1917–1929.

1930b. Note on the Roseate Spoonbill in Florida: Auk, vol. 47, p. 416, July.
Record of two specimens in the Florida State Museum at Gainesville.

1931. Some bird records from Florida: Auk, vol. 48, pp. 436–439, July.
Records of 9 species, including the Ivory-billed Woodpecker and the Carolina Paroquet.

BYRD, HIRAM

1925. [List of the breeding birds of Florida]: Florida Trucker, p. 8, June.
A nominal list of 146 forms based on a list compiled in the U. S. Biological Survey.

1928. Florida Jay: Florida Naturalist, vol. 1, p. 87.
Record of birds seen in Marion, Manatee, and Sarasota Counties.

"T. B. C."

1895. A turkey hunt in Florida: Forest and Stream, vol. 44, pp. 325–326, April 27.
Habits of the Florida Turkey on the Anclote River.

CABANIS, JEAN

1866. Ueber neue oder weniger bekannte exotische Vögel: Journ. für Ornith., vol. 13, no. 78, pp. 406–414, November, 1865 [= 1866].
Contains original description of *Certhiola bairdii* [= *Coereba bahamensis*], type from Indian Key, Fla.

CAHOON, JOHN CYRUS

1884. A Wood Duck's stratagem: Forest and Stream, vol. 23, p. 286.
Account of capture of a bird on the Withlacoochee River.

1885. The Florida Burrowing Owl (*Speotyto cunicularia floridana*): Orn. and Ool., vol. 10, p. 21 February.
Nesting habits near Charlotte Harbor.

1888. The Willet alighting on trees: Forest and Stream, vol. 30, p. 165.
Observations at Charlotte Harbor.

1890. A kite new to the North American fauna: Orn. and Ool., vol. 15, p. 35, March.
Record of *Ictinia plumbea* taken by J. H. Batty at Palm Hammock, Dade County [later shown to be *Ictinia mississippiensis* (Chapman, 1891b, p. 94)]. This was probably the Palm Hammock in Monroe County, as Batty operated on the Gulf coast.

"CAPTAIN"

1897. The Bobolinks in Florida: Forest and Stream, vol. 48, p. 405, May 22.
Records from Interlachen.

1897. Florida snipe flight: Forest and Stream, vol. 48, p. 406, May 22.
Records from Interlachen.

CARRYL, FRANK MALLARY

1919. Sparrow Hawk: Oologist, vol. 36, p. 117, July.
Catching English Sparrows at Palm Beach, Fla.

CASSIN, JOHN (see also Baird, Cassin, and Lawrence)

1850. [Special report upon the department of ornithology]: Proc. Acad. Nat. Sci. Philadelphia, vol. 4, pp. 256–260.
Contains records of *Cymindis hamatus* [= *Rostrhamus sociabilis*], *Vireo longirostris* [= *Vireo calidris barbatula* auct.], *Thalasseus regius* [= *T. maximus*], *Sternula frenata* [= *Sterna antillarum*], and *Ardea rufescens* [= *Dichromanassa rufescens*] from Florida.

1851. Sketch of the birds composing the genera Vireo, Vieillot, and Vireosylva, Bonaparte, with a list of the previously known and descriptions of three new species: Proc. Acad. Nat. Sci. Philadelphia, vol. 5, February, pp. 149–154.
Contains mention of the capture of the Black-whiskered Vireo by Doctor Heermann in Florida.

CASSIN, JOHN (Continued)

1853–1855. Illustrations of the birds of California, Texas, Oregon, British and Russian America. Philadelphia, pp. 1–298.
Contains (pp. 221–222) account of habits of the Black-whiskered Vireo at Charlotte Harbor and mention of Flamingoes seen there.

1865. Notes on some new and little known rapacious birds: Proc. Acad. Nat. Sci. Philadelphia, pp. 2–5.
Contains original description of *Polyborus audubonì* from Florida.

CASTLE, WILLIAM W.

1891. *Ictinia mississippiensis:* Orn. and Ool., vol. 16, p. 44, March.
Remarks on a specimen of the Mississippi Kite taken at Palm Hammock and previously recorded as *Ictinia plumbea* by Cahoon.

CHAPIN, EDWARD ALBERT

1925. Food habits of the vireos: U. S. Dept. Agr. Bul. 1355, 44 pp., November.

CHAPLINE, MRS. NEAL WYATT

1914. Florida the fascinating. 190 pp.
Contains a few casual allusions to birds and a discussion of Bartram's "painted vulture."

CHAPMAN, FRANK MICHLER (see also Brewster and Chapman)

1888a. A list of birds observed at Gainesville, Florida: Auk, vol. 5, pp. 267–277, July.
Annotated list of 149 species seen between November 27, 1886, and May 27, 1887.

1888b. *Oidemia perspicillata* in Florida: Auk, vol. 5, p. 319, July.
Record of a specimen taken near Punta Rassa.

1889a. [Shorebirds in Florida]: Auk, vol. 6, p. 196, April.
Record of Knots on the west coast.

1889b. *Helminthophila bachmani* on the east coast of Florida: Auk, vol. 6, pp. 278–279, July.
Two specimens taken at Oak Lodge, opposite Micco.

1890a. [Florida notes]: Abstr. Proc. Linn. Soc. New York, no. 2, p. 2.
Notes on Bachman's Warbler, Carolina Paroquet, Florida Duck, and Great White Heron.

1890b. [Remarks on a trip to Brevard County, Florida, in the spring of 1889]: Abstr. Proc. Linn. Soc. New York [no. 2] for the year ending March 7, 1890, p. 3.
Mentions capture of two Bachman Warblers and 15 Carolina Paroquets.

1890c. Notes on the Carolina Paroquet (*Conurus carolinensis*) in Florida: Abstr. Proc. Linn. Soc. New York, no. 2, pp. 4–6 (read November 1, 1889).
Habits as observed on the Sebastian River in 1889.

1890d. On the eastern forms of *Geothlypis trichas:* Auk, vol. 7, pp. 9–14, January.
Original description of *Geothlypis trichas ignota;* type from Tarpon Springs; specimens from Palatka and Lake George.

1891a. *Ictinia mississippiensis:* Orn. and Ool., vol. 16, p. 44, March.
A specimen taken at Palm Hammock and recorded by Cahoon as *Ictinia plumbea* shown to be this species.

1891b. The Carolina Paroquet: Forest and Stream, vol. 37, p. 44, August 6.
Said to be very scarce in Florida; information on habits requested.

1891c. On the color-pattern of the upper tail-coverts in *Colaptes auratus:* Bul. Amer. Mus. Nat. Hist., vol. 3, pp. 311–314.
Records of 3 specimens taken in Florida.

1892. A preliminary study of the grackles of the subgenus Quiscalus: Bul. Amer. Mus. Nat. Hist., vol. 4, pp. 1–20.
Contains records of *Quiscalus quiscula aglaeus* from Florida.

1895. Handbook of Birds of Eastern North America. New York, 418 pp.; 20 plates.

1896a. The standing of *Ardetta neoxena:* Auk, vol. 13, pp. 11–19.
Considered a valid species; six Florida records given, with a bibliography.

1896b. The changes of plumage in the Dunlin and Sanderling: Bul. Amer. Mus. Nat. Hist., vol. 8, pp. 1–8.
Contains description of a moulting specimen of *Crocethia alba* from Micco, Fla.

1898a. Notes on the Black Seaside Finch (*Ammodramus nigrescens*): Auk, vol. 15, p. 270, July.
Habits as observed on Merritt Island.

1898b. Kirtland's Warbler (*Dendroica kirtlandi*): Auk, vol. 15, pp. 289–293, October.
Record of a specimen taken at West Jupiter, Fla.

1899a. The Pelicans of Pelican Island, Indian River, Florida: Abstr. Proc. Linn. Soc. New York, no. 11, p. 3 (read May 10, 1898).
Breeding habits described.

1899b. The distribution and relationships of *Ammodramus maritimus* and its allies: Auk, vol. 16, pp. 1–12, January.
Contains numerous records from Florida; original description of *A. maritimus fisheri*, and record of same from Tarpon Springs.

1900a. Bird studies with a camera. xiv + 218 pp.
Contains a chapter on "Life on Pelican Island, with some speculations on the origin of bird migration." Describes habits of the Brown Pelican as observed at Pelican Island in March, 1898; 845 nests counted; total population, 2,730.

1900b. The proper name for the Florida Yellowthroat: Auk, vol. 17, pp. 389–390, October.
Brief notes on habits in Florida.

1900c. A study of the genus *Sturnella:* Bul. Amer. Mus. Nat. Hist., vol. 13, pp. 297–320, 8 figs., December 31.
Remarks on the validity of *Sturnella magna argutula* with numerous records and measurements.

1901a. A new race of the Great Blue Heron, with remarks on the status and range of *Ardea wardi:* Bul. Amer. Mus. Nat. Hist., vol. 14, pp. 87–90, April 15.
Contains records and measurements of specimens of *Ardea h. wardi* from Florida.

1901b. Pelican Island revisited: Bird-Lore, vol. 3, pp. 3–8, February.
Description of conditions in the Pelican Island Rookery in April, 1900.

1902. The Great Auk in Florida: Bird-Lore, vol. 4, p. 97, June.
Brief statement of the discovery of a humerus of the Great Auk at Ormond.

1904. A letter from Florida: Bird-Lore, vol. 6, p. 103, June.
Account of a trip in April, 1904, from Kissimmee to Lake Okeechobee and to Sebastian. Mention of seeing 12 Carolina Paroquets.

1905a. Note on the migration of warblers from the Bahamas to Florida: Bird-Lore, vol. 7, p. 140, April.
Warblers seen flying in daylight low over the ocean.

1905b. A contribution to the life history of the American Flamingo (*Phoenicopterus ruber*) with remarks upon specimens: Bul. Amer. Mus. Nat. Hist., vol. 21, pp. 53–77, June 15.

1907a. The eastern forms of *Geothlypis trichas:* Auk, vol. 24, pp. 30–34, January.
Contends that the Southern [Florida] Yellowthroat should be called *Geothlypis trichas trichas* and the Northern Yellowthroat *G. trichas brachidactyla.*

1907b. The warblers of North America. 306 pp., 24 plates, 128 text figures.
Contains many migration records in Florida.

1907c. Florida bird life: Abstr. Proc. Linn. Soc. New York, nos. 17–19, p. 3, October 22 (presented October 25, 1904).
Note on the Pelicans of Pelican Island and mention of Carolina Paroquets seen in 1904.

1908a. The home-life of the American Egret: Bird-Lore, vol. 10, pp. 59–68, April.
Description of a nesting colony, presumably in Florida.

1908b. Cuthbert rookery: Amer. Mus. Journ., vol. 8, pp. 98–101, November.
Brief account of a visit to the rookery in 1908, with two photographs.

1908c. Camps and cruises of an ornithologist. xvi + 415 pp., 250 photographs.
Contains chapters on Pelican Island; the Florida Great Blue Heron and the Water-Turkey; the American Egret; Cuthbert Rookery; and the Flamingo.

CHAPMAN, FRANK MICHLER (Continued)

1908d. Florida Blue Jay: Bird-Lore, vol. 10, p. 212, October.
Photo taken at Gainesville, Fla.

1909. The Bobolink: Bird-Lore, vol. 11, pp. 137–140, June.
The migration route of the Bobolink said to pass through Florida.

1912. Handbook of birds of eastern North America. (Rev. ed.) 530 pp.
Contains record (p. 318) of the last Carolina Paroquets seen in Florida.

1913a. [Remarks on a recent trip to Florida]: Abstr. Proc. Linn. Soc. New York, no. 21, p. 15, February.
Records of the Yellow-billed Cuckoo at Gainesville and of 300 nests of the Brown Pelican on Pelican Island on April 17, 1908.

1913b. [Account of a visit to the Cuthbert Rookery in March, 1908]: Abstr. Proc. Linn. Soc. New York, no. 21, p. 17.
Estimate of numbers of herons, spoonbills, etc., breeding in the rookery.

1914a. [Editorial describing a visit to Pelican Island in February, 1914]: Bird-Lore, vol. 16, pp. 124–125, April.
Many young Pelicans found dead and others dying of starvation.

1914b. The Roseate Spoonbill: Bird-Lore, vol. 16, pp. 214–217, 1 col. plate, June.
Nesting and other habits as observed in southern Florida.

1915a. The whisper songs of birds: Bird-Lore, vol. 17, p. 127, April.
Notes on the relation between temperature and singing of the Mockingbird in Florida.

1915b. Review of Watson's "Homing and related activities of birds": Bird-Lore, vol. 17, pp. 460–461, December.

1918. Notes from a traveler in the Tropics, down the coast line to Cuba: Bird-Lore, vol. 20, pp. 393–397, December.
Contains records of birds seen on the Florida Keys.

1924. [Editorial]: Bird-Lore, vol. 26, p. 207, June 1.
History of the Pelican Island rookery and its desertion by the Pelicans.

1930. Notes on the plumage of North American birds: Bird-Lore, vol. 32, pp. 265–267, August.
Contains notes on the Ivory-billed Woodpecker in Florida.

1931. *Columba squamosa* at Key West: Auk, vol. 48, p. 116, January.
Record of a bird killed May 6, 1929.

CHARLEVOIX, PIERRE FRANÇOIS XAVIER DE

1866. History and general description of New France. 6 vols.; translation by John Gilmary Shea.
Contains (vol. 1, p. 140) mention of a few birds found in Florida by Jean Ribaut (1562).

CHERRIE, GEORGE KRUCK

1897. *Aegialitis nivosa* in Florida: Auk, vol. 14, pp. 402–403, October.
Found to be common on Santa Rosa Island; 19 specimens taken.

CHILDS, JOHN LEWIS

1900. Intelligence of the Shrike: Auk, vol. 17, p. 68, January.
A wounded Shrike in Florida assisted by its mate.

1902. First takes of the season: Oologist, vol. 19, p. 56, March.
Records of eggs of Ward's Heron, Florida Crane, and Florida Barred Owl taken in Manatee County, Fla.

1903a. Taking a set of Florida Barred Owl: Warbler, vol. 1, p. 36.
Eggs taken on Miakka River, Fla.

1903b. Fires and Sparrow Hawks: Warbler, vol. 1, p. 42.
In Manatee County, Fla.

1905. Eggs of the Carolina Paroquet (*Conurus carolinensis*): Warbler (ser. 2), vol. 1, pp. 97–98.
Description and photograph of eggs laid in captivity by a bird captured near Lake Okeechobee by R. Ridgway.

1906. Eggs of the Carolina Paroquet (*Conurus carolinensis*): Warbler (ser. 2), vol. 2, p. 65.
Record of a set of 3 eggs taken near the head of the Caloosahatchee River, April 2, 1896, by Dr. H. E. Pendry.

1909. Authentic eggs of Cory's Least Bittern: Warbler, vol. 5, p. 14.
Eggs taken May 2, 1909, at Micanopy, Fla., by O. E. Baynard.

"Chobee, O. K."

1891a. Florida bird notes: Forest and Stream, vol. 36, p. 44, February 5.
Robins reported abundant near Biscayne Bay.

1891b. Pelican and catfish: Forest and Stream, vol. 36, p. 104, February 26.
Record of a Brown Pelican killed by taking a catfish into its pouch.

Christy, Bayard Henderson

1928a. Bird notes from southern Florida: Auk, vol. 45, pp. 283–289, July.
Notes on 43 species observed on the Kissimmee Prairie, the Everglades, Cape Sable, etc.

1928b. A wading-bird rookery: Auk, vol. 45, pp. 423–429, October.
Account of two visits to a rookery near Cape Sable, Fla., with estimates of the numbers of 10 species nesting there.

Clarke, James K.

1909. Ducks on Lake Worth: Forest and Stream, vol. 72, p. 654, April 24.
Record and photograph of a large flock of Scaup Ducks.

Clarke, Samuel C.

1871. Pelicans: Amer. Naturalist, vol. 5, pp. 252, 253.
Notes on the habits of Brown Pelicans at Pelican Island and mention of a specimen of the White Pelican taken in eastern Florida.

1876. Fish Hawks and Eagles: Forest and Stream, vol. 7, p. 276, December 7.
Account of a Bald Eagle robbing an Osprey of a fish on the Halifax River.

1878. Notes on the birds of Halifax Inlet, East Florida: Forest and Stream, vol. 10, p. 255, May 9.
Habits of the Osprey, Bald Eagle, etc.

1885. The Ivory-billed Woodpecker in Florida: Forest and Stream, vol. 24, p. 367, June 4.
Record of a specimen taken near New Smyrna, in 1872.

Cleaves, Howard Henderson

1913. What the American Bird Banding Association has accomplished during 1912: Auk, vol. 30, pp. 248–261, April.
Contains notes furnished by Oscar E. Baynard on herons and ibises banded at Orange Lake, Fla.

Coale, Henry Kelso

1914. Southern Meadowlark (*Sturnella magna argutula*) in northern Illinois: Auk, vol. 31, p. 540, October.
Contains measurements of a specimen from Lukens, Fla.

Connor, Jeannette Thurber

1927. Jean Ribaut, the whole and true discouerye of Terra Florida.
A facsimile reprint of the London edition of 1563, together with a transcript of an English version in the British Museum, with notes by H. M. Biggar, and a biography. Florida State Hist. Soc., xiv + 139 pp.
In this translation of Ribaut's journal mention is made of several kinds of birds seen at the mouth of the St. Johns River in May, 1562.

Cooke, May Thacher

1923. Report on bird censuses in the United States, 1916 to 1920: U. S. Dept. Agr. Bul. 1165, 34 pp., July 20.
Contains bird counts from St. Marks, Fla. (44 species).

1925. Spread of the European Starling in North America: U. S. Dept. Agr. Circ. 336, 7 pp., March.
Contains records of the Starling at Amelia Island and Lake Jackson.

COOKE, WELLS WOODBRIDGE

1903. The migration of warblers: Bird-Lore, vol. 5, pp. 188–193, December.
Contains records of the Redstart, Blackburnian Warbler, and Prothonotary Warbler from Florida.

1904a. Distribution and migration of North American warblers: U. S. Dept. Agr. Biol. Survey Bul. 18, 142 pp.
Contains many Florida migration records.

1904b. The migration of warblers: Bird-Lore, vol. 6, pp. 21–24 (February); pp. 130–131 (August); 162–163 (October); 199–200 (December).
Contains records of the Hooded, Yellow-throated, Chestnut-sided, and Kirtland's Warblers in Florida.

1904c. Some new facts about the migration of birds: Condor, vol. 6, pp. 115–126, September 17.
Contains much information about bird migration in Florida.

1905a. Routes of bird migration: Auk, vol. 22, pp. 3–11, January.
Remarks on species migrating through Florida.

1905b. The migration of warblers: Bird-Lore, vol. 7, pp. 32–35, 135–136, 203–206, 237–239, 275–278.
Contains records of the Yellow Warbler at Key West; Prairie Warbler at Fowey Rocks Lighthouse; Kentucky Warbler at Tarpon Springs; Connecticut Warbler in northern and southern Florida; Black and White Warbler at Alligator Reef and on Sombrero Key; Black-poll Warbler in southern Florida; Cape May Warbler in northern and southern Florida; and Tennessee Warbler at Key West.

1906a. The migration of warblers: Bird-Lore, vol. 8, pp. 26–27, 62, 102, 168, 203–204.
Contains records of Swainson's Warbler, Bachman's Warbler, Myrtle Warbler, Louisiana Water-Thrush, Parula Warbler, Black-throated Blue Warbler, and Cerulean Warbler from Florida.

1906b. Distribution and migration of North American ducks, geese, and swans: U. S. Dept. Agr. Biol. Survey Bul. 26, 90 pp.
Contains a few Florida records.

1907. The migration of thrushes: Bird-Lore, vol. 9, pp. 32–34, February; pp. 121–125, June.
Contains records of the Wood Thrush, Wilson's Thrush, Gray-cheeked Thrush, and Hermit Thrush in Florida.

1908a. The migration of flycatchers: Bird-Lore, vol. 10, pp. 114–117, 166–170, 210–212; June, August, October.
Contains records of the Acadian Flycatcher from Whitfield and Tallahassee; Kingbird from Tallahassee; Wood Pewee from Whitfield and Punta Rassa; and Phoebe from northern Florida.

1908b. The Nelson Sparrow in Georgia and Florida: Auk, vol. 25, pp. 318–319, July.
Record of *Ammodramus nelsoni* taken at Titusville and Cedar Keys.

1908c. The Acadian Sharp-tailed Sparrow in Georgia and Florida: Auk, vol. 25, p. 319, July.
Recorded by Worthington as a common winter resident on Amelia Island.

1909a. The migration of flycatchers: Bird-Lore, vol. 11, pp. 12–14, February.
Contains arrival dates of the Crested Flycatcher in northern Florida.

1909b. The migration of vireos: Bird-Lore, vol. 11, pp. 78–82, 118–120, 165–168.
Contains arrival dates of the Red-eyed Vireo in northern Florida.

1909c. The migration of North American sparrows: Bird-Lore, vol. 11, pp. 254–260, December.
Contains migration records of the Chipping Sparrow at Gainesville, Fla.

1910a. The migration of North American sparrows: Bird-Lore, vol. 12, pp. 12–15, 67–70, 111–112, 139–141.
Contains migration records of the Grasshopper Sparrow, Leconte's Sparrow, Song Sparrow, Nelson's Sparrow, Acadian Sharp-tailed Sparrow, Pine Siskin, and Goldfinch.

1910b. Distribution and migration of North American shorebirds: U. S. Dept. Agr. Biol. Survey Bul. 35, 100 pp., 4 plates, October 6. [Rev. ed. May 18, 1912.]
Contains many migration records from Florida.

1911a. The migration of North American sparrows: Bird-Lore, vol. 13, pp. 83–88, April; 198–201, August; 248–249, October.
Contains records of the Dickcissel, Vesper Sparrow, Blue Grosbeak, Indigo Bunting, and Painted Bunting in Florida.

1911b. Our greatest travelers: Birds that fly from pole to pole and shun the darkness: Birds that make 2,500 miles in a single flight: Nat. Geogr. Mag., vol. 22, pp. 346–365; 12 maps, April.
Contains remarks on Florida as a highway of bird migration.

1912. The migration of North American sparrows: Bird-Lore, vol. 14, pp. 45–47, February; 98–105, April; 158–161, June.
Contains records of the Red Crossbill seen at Fernandina and of White-throated Sparrows seen at Tallahassee and Gainesville.

1913a. The migration of North American sparrows: Bird-Lore, vol. 15, pp. 104–107, April; 236–240, August.
Contains records of the Fox Sparrow and Swamp Sparrow from Florida.

1913b. Distribution and migration of North American herons and their allies: U. S. Dept. Agr. Biol. Survey Bul. 45, 70 pp., 21 maps.
Contains numerous Florida records.

1914a. The migration of North American sparrows: Bird-Lore, vol. 16, pp. 19–23, 176–178, 438–442.
Contains records of the Purple Finch, Bachman's Sparrow, and Slate-colored Junco from Florida.

1914b. Distribution and migration of North American rails and their allies: U. S. Dept. Agr. Bul. 128, 47 pp., September 25.
Contains numerous Florida records.

1915a. The migration of North American kinglets: Bird-Lore, vol. 17, pp. 118–125, April.
Contains records of the Golden-crowned and Ruby-crowned Kinglets from Florida.

1915b. Bird migration: U. S. Dept. Agr. Bul. 185, 47 pp., April 17.
Contains information on bird migrations through Florida.

1915c. The migration of North American birds: Bird-Lore, vol. 17, pp. 199–203, June.
Contains records of the Brown Creeper and Blue-gray Gnatcatcher from Florida.

1915d. Distribution and migration of North American gulls and their allies: U. S. Dept. Agr. Bul. 292, 70 pp., October 25.
Contains numerous records from Florida.

1915e. The migration of North American birds: Bird-Lore, vol. 17, pp. 443–445, December.
Contains records of the Red-breasted Nuthatch from Florida.

1915f. Our shorebirds and their future: U. S. Dept. Agr. Yearbook for 1914, pp. 275–294.

Cooper, James Graham

1876. New facts relating to California ornithology—no. 1: Proc. California Acad. Sci., vol. 6, pp. 189–202.
Mention (p. 197) of characters of the Florida Crow; specimens taken by Cooper at Fort Dallas.

Copeland, Manton (see Bent and Copeland)

Cordier, Albert Hawes

1923. Birds—their photographs and home life. 247 pp., 144 illus., Philadelphia.
Contains numerous references to birds seen in Florida.

Cory, Charles Barney ("Owen Nox")

1880. Birds of the Bahama Islands. 250 pp.
Contains description of nest of Yellow-throated Warbler taken near Jacksonville, Fla.

1881. Southern rambles. Boston, 149 pp.
An account in jocular style of a trip up the St. Johns River to Lake Harney; casual mention of a few birds.

1886a. Description of a new North American species of Ardetta: Auk, vol. 3, p. 262, April.
Original description of *Ardetta neoxena*.

Cory, Charles Barney (Continued)

1886b. More news of *Ardetta neoxena:* Auk, vol. 3, p. 408, July.
Type said to have been taken on the Caloosahatchee River near Lake Okeechobee.

1886c. Another specimen of *Ardea würdemanni?*: Auk, vol. 3, p. 408, July.
A specimen killed in southwestern Florida; also several *Ardea occidentalis.*

1887. More news of *Ardea würdemanni:* Auk, vol. 4, p. 159, April.
Records of *Ardea würdemanni, Ardea occidentalis,* and *Haliaeetus leucocephalus* breeding near Cape Sable.

1889. *Buteo brachyurus* in Florida: Auk, vol. 6, p. 275, July.
A specimen claimed to have been taken at Charlotte Harbor.

1890. Eggs of the Florida Dusky Duck: Auk, vol. 7, p. 204, April.
Record of breeding of *Anas fulvigula* on the Banana River.

1891. Capture of a fourth specimen of *Ardetta neoxena:* Auk, vol. 8, p. 309, July.
Specimen taken on the Kissimmee River.

1892. Catalogue of West Indian birds. Boston, 163 pp.
Contains record of the Yellow Rail from the upper St. Johns River, Fla. (p. 138).

1895. Florida notes: Auk, vol. 12, pp. 187–188, April.
Record of birds killed by the freeze of February 9, 1895; Carolina Paroquets reported common near Okeechobee.

1896a. A list of the birds of Florida. Boston, pp. 1–24.
A nominal list of 352 forms, with brief annotations on a few species.

1896b. Hunting and fishing in Florida, including a key to the water birds known to occur in the State. Boston, 304 pp.; illustrated by cuts of each species.
Contains much information on distribution of birds in Florida.

1898. Kirtland's Warbler (*Dendroica kirtlandi*) in Florida: Auk, vol. 15, p. 331, October.
Record of specimen taken at West Jupiter.

Cottam, Clarence

1930. Food habits of the shoalwater and diving ducks of Florida: Florida Woods and Waters, summer edition [July], pp. 37–38.
Food of 12 species, based on studies in the U. S. Biological Survey.

Coues, Elliott

1871. Progress of American ornithology: Amer. Nat., vol. 5, pp. 364–373, August.
A review of Allen's "On the mammals and winter birds of East Florida"; original description of *Pipilo alleni.*

1872. Key to North American birds. 361 pp.
Contains original description of *Ortyx* [*Colinus*] *virginianus* var. *floridanus;* type from Enterprise, Fla.

1874a. The cranes of America: Forest and Stream, vol. 3, p. 20, August 20.
Popular sketch of the Whooping Crane and the Sandhill Crane; brief notes on habits of the latter in Florida.

1874b. Birds of the Northwest: U. S. Geol. Surv. Terr., Misc. Pub. no. 3, xi + 791 pp.
Contains records of specimens of the Yellow-headed Blackbird and the Bridled Tern from Florida.

1875. Fasti ornithologiae redivivi no. 1. Bartram's Travels: Proc. Acad. Nat. Sci. Philadelphia, pp. 338–358.
An extended review of Bartram's work with annotations identifying each species.

1878. Habits of the Kingfisher (*Ceryle alcyon*): Bul. Nuttall Orn. Club, vol. 3, p. 92, April.
Account of a Kingfisher eating sour-gum berries.

1883. The Burrowing Owl in Florida: Bul. Nuttall Orn. Club, vol. 8, p. 61, January.
Reported common on the Kissimmee Prairie.

1884. Key to North American birds, 2d ed., Boston, xxx + 863 pp.
Contains original description of *Cyanocitta cristata florincola;* type from Welaka, Fla. (No. 5190, Mus. Comp. Zool.), selected by Wm. Brewster at request of Doctor Coues, March 9, 1898.
1885. Probable occurrence of *Diomedea exulans* in Florida: Auk, vol. 2, p. 387, October.
Record of a bird seen at the mouth of the St. Johns River.
1888. New forms of North American *Chordiles:* Auk, vol. 5, p. 37, January.
Contains original description of *Chordeiles minor chapmani*, type from Gainesville, Fla.
1899. The finishing stroke to Bartram: Auk, vol. 16, pp. 83–84, January.
Remarks on nomenclature of the Florida Jay; Florida Crow renamed *Corvus americanus pascuus.*

CRICHLOW, B. O.
1928a. Florida bird notes: Florida Naturalist, vol. 1, pp. 51–53, April [March].
Notes on 13 species occurring in northern Florida.
1928b. Gray-cheeked Thrush: Florida Naturalist, vol. 1, p. 87, July.
Record of several Gray-cheeked Thrushes seen on Anastasia Island.
1929. Up the Chassahowitzka River: Florida Naturalist, vol. 2, pp. 103–104, July.
Account of a visit to Cormorant Island, in Chassahowitzka Bay, Fla.; mention of numerous species seen.
[Reprinted in The Oologist, vol. 46, pp. 135–136, October, 1929.]

CROSBY, MAUNSELL SCHIEFFELIN (see also Griscom and Crosby)
1926. Bird-Lore's twenty-sixth Christmas census: Bird-Lore, vol. 28, p. 35, February.
Records of 81 species seen in Lee County (Punta Rassa to Alva), December 25, 1925.

CURZON, ROBERT
1891. Lost in a mangrove swamp: Orn. and Ool., vol. 16, pp. 138–139, September.
Mention of the Wood Ibis, Glossy Ibis, Limpkin, etc. [no locality given except "across the Weealockale"].

DANFORTH, STUART TAYLOR
1926. An ecological study of Cartagena Lagoon, Porto Rico, with special reference to the birds: Journ. Dept. Agr. Porto Rico, vol. 10, pp. 1–130, January.

DANIEL, JOHN WARWICK, JR.
1902. Pelicans of Tampa Bay: Wilson Bul., vol. 9, pp. 5–7, March.
Habits of the Pelicans, as observed at Tampa in December.

DANN, ROBERT E.
1927. American Bald Eagles: Oologist, vol. 44, p. 98, July.
Nesting near Apopka; record of a Woodcock seen.

DAVIE, OLIVER
1889. Nests and eggs of North American birds. Columbus, Ohio, 455 + xii pp.
Contains many references to breeding of Florida birds.

DAVIS, WILLIAM T.
1912. Tame wild turkeys: Bird-Lore, vol. 14, pp. 342–344, 2 photos, December.
Turkeys at Everglade and Deep Lake, Fla.

DAWSON, FRANCES ETTA
1929. Lamping the Limpkin. [Compiled from the field notebooks of the late W. Leon Dawson]: Nature Magazine, vol. 14, pp. 211–213, 4 illus., October.
Habits of the Limpkin, from original observations in Florida.

DEADRICK, WILLIAM H.
1894. A collecting trip in Florida: Oologist, vol. 11, pp. 11–12, January.
Notes on nesting habits of herons and other birds in Leon County.

DEANE, RUTHVEN
1879. Additional cases of albinism and melanism in North American birds: Bul. Nuttall Orn. Club. vol. 4, pp. 27–30, January.
Mention of an albino Mockingbird taken at St. Augustine, Fla.

DICKEY, DONALD RYDER, AND A. J. VAN ROSSEM

1924. The status of the Florida Gallinule of western North America: Condor, vol. 26, p. 93, May.
Remarks on the plumage of Florida specimens.

DICKINSON, W. J.

1894. Nesting of the Ground Dove. Bul. no. 2, Wilson Orn. Chapter, p. 5.

"DIDYMUS" (see Heade, M. J.)

DIMOCK, ANTHONY WESTON, AND JULIAN ANTHONY DIMOCK

1908. Florida enchantments. New York, x + 318 pp.
Contains a chapter on "Life in a bird rookery" [at Ten Thousand Islands] and numerous allusions to birds in other chapters.

DODGE, MARY C.

1920. Nonpareil wintering in Florida: Bird-Lore, vol. 22, pp. 101–102, April.
Record of 4 birds seen daily at Daytona from February 5 to March 24, 1919.

DOUBLEDAY, NELLIE BLANCHAN DE GRAFT ("NELTJE BLANCHAN")

1902. Birds that hunt and are hunted. New York, xii + 359 pp., 48 colored plates.
Contains a few observations on Florida birds.

DU MONT, PHILIP ATKINSON

1929. Ani (*Crotophaga ani*) wintering in Florida: Auk, vol. 46, p. 546, October.
One observed at Pass-a-Grille during January and February, 1929.

1930. Abundance of wintering Limicolae on the Florida west coast: Auk, vol. 47, pp. 247–248, April.
Records of 22 species in the Tampa Bay region.

1931. Summary of bird notes from Pinellas County, Florida: Auk, vol. 48, pp. 246–255, April.
Annotated list of 46 species with a summary of previous records.

DUTCHER, WILLIAM

1903. Report of the A. O. U. Committee on the protection of North American birds: Auk, vol. 20, pp. 101–159, January.
Contains reports on condition of bird reservations on Pelican Island, Key West, and the Tortugas.

1904. Report of the A. O. U. Committee on the protection of North American birds for the year 1903: Auk, vol. 21, pp. 97–208, January.
Contains reports of condition of the bird colonies on Pelican Island and the Dry Tortugas, and a report by A. C. Bent and H. K. Job on observations in the Cape Sable region.

1907a. Reservation news: Bird-Lore, vol. 9, pp. 52–53, February 1.
Notes on the condition of Pelican Island Rookery in November and December, 1906.

1907b. [Notes on a visit to Florida]: Abstr. Proc. Linn. Soc. New York, no. 17, pp. 9, 11, October.
Notes on Brown Pelicans, Pileated Woodpeckers, Robins, Herring Gulls, and Scaups.

1907c. [Note on Pelican Island]: Abstr. Proc. Linn. Soc. New York, no. 19, pp. 25, 28, October.
Reports that on December 1, 1906, there were 1,000 nests containing eggs on Pelican Island, Fla. On February 12, 1907, he noted that young were on the wing.

1908a. Reservation news: Bird-Lore, vol. 10, pp. 145–146, June 1.
Contains brief note on condition of the Pelican Island Rookery.

1908b. Reservation news: Bird-Lore, vol. 10, pp. 186–192, August.
Contains letters giving information on reservations at Mosquito Inlet, Passage Key, and the Tortugas.

DWIGHT, JONATHAN, JR.

1882. *Buteo brachyurus*—a correction: Bul. Nuttall Orn. Club, vol. 7, p. 184, July.
The specimen recorded from Palatka was taken February 22, 1881, not February 1.

1889. Linnaean Society of New York: Auk, vol. 6, pp. 196–204, April.
Record of Purple Gallinule breeding at Lake Harris, Fla.

1896. The Sharp-tailed Sparrow (*Ammodramus caudacutus*) and its geographical races: Auk, vol. 13, pp. 271–278, July.
Recorded from Tarpon Springs.

1900. The moult of the North American shore birds (Limicolae): Auk, vol. 17, pp. 368–385, October.
Contains a number of Florida records.

"E., W."

1888. Notes from Florida: Oologist, vol. 5, p. 177, December.
Records of eggs of 16 species taken in Florida.

EARLE, CARLOS THEODORE

1907. Bird-Lore's seventh Christmas bird census: Bird-Lore, vol. 9, p. 27, February.
Records of 17 species seen at Palma Sola.

1908. The eighth Christmas bird census: Bird-Lore, vol. 10, p. 33, January.
Records of 38 species seen at Palma Sola.

1909. The ninth Christmas bird census: Bird-Lore, vol. 11, p. 28, February.
Records of 29 species seen at Palma Sola.

1910. Bird-Lore's tenth Christmas bird census: Bird-Lore, vol. 12, p. 30, February.
Records of 26 species seen at Palma Sola.

1911. Bird-Lore's eleventh bird census: Bird-Lore, vol. 13, p. 34, February.
Records of 36 species seen at Palma Sola, December 26, 1910.

1912. Bird-Lore's twelfth Christmas bird census: Bird-Lore, vol. 14, p. 33, February.
Records of 53 species seen at Palma Sola, December 25, 1911.

1913. Bird-Lore's thirteenth bird census: Bird-Lore, vol. 15, p. 34, February.
Records of 51 species seen at Palma Sola, December 26, 1912.

1926. Bird-Lore's twenty-sixth Christmas census: Bird-Lore, vol. 28, p. 36, February.
Records of 80 species observed in Tampa Bay, December 25, 1925.

1930. Bird-Lore's thirtieth Christmas census: Bird-Lore, vol. 32, p. 43, February.
Records of 70 species seen at Palma Sola, December 25, 1929.

EARLE, ELEANOR POITEVENT

1907. Bird-Lore's seventh Christmas bird census: Bird-Lore, vol. 9, p. 27, February.
Records of 20 species seen at Palma Sola, Fla., December 26, 1906.

1908a. The eighth Christmas bird census: Bird-Lore, vol. 10, p. 33, February.
Records of 41 species seen at Palma Sola, Fla., December 25, 1907.

1908b. Passage Key, Florida: Bird-Lore, vol. 10, pp. 186–187, August.
A letter reporting the birds nesting on Passage Key.

EATON, ELON HOWARD

1910–1914. Birds of New York. New York State Mus. Memoir 12, 2 vols., pp. 1–501; 1–715, 106 plates.

ECK, WALTER I.

1908. Bird-Lore's eighth Christmas bird census: Bird-Lore, vol. 10, p. 33, January.
Record of 35 species seen at Melrose, December 25, 1907.

EDWARDS, GEORGE

1750. A natural history of birds, etc. London, part 3, 157 + clvii pp.
Quotes Catesby as saying the "Hooping Crane" [= Florida Crane] occurs in great numbers near St. Augustine, Fla.

ELIOT, WILLARD

1888. Notes from Florida: Oologist, vol. 5, p. 177, December.
Nesting dates of various birds at Thonotosassa.

1891. Items of interest from Florida: Oologist, vol. 8, pp. 144–145, July.
Nesting data from Thonotosassa.

1892a. A day's trip for Bald Eagle nests in Florida: Oologist, vol. 9, p. 40, February.
Three nests found near Tampa Bay.

1892b. The Wood Ibis: Oologist, vol. 9, pp. 143–144, May.
Nesting habits in Florida.

1893. Osprey in Florida and other notes: Oologist, vol. 10, pp. 23–24, January.
Nesting habits of various species in Florida.

ELLIOT, DANIEL GIRAUD

1869. The new and heretofore unfigured species of the birds of North America. Vols. 1 and 2.

1870. A monograph of the genus Pelecanus: Proc. Zool. Soc. London, vol. 37, 1869 (1870), pp. 571–591.

Contains description of habits of the Brown Pelican in Florida.

1877. Review of the Ibidinae or subfamily of the ibises: Proc. Zool. Soc. London, pp. 477–510, June 5.

Contains account (p. 508) of habits of the White Ibis in Florida.

1895. North American shore birds. 253 pp., 74 plates.

Contains account of Long-billed Curlew seen near St. Augustine.

ELLIOTT, WALTER

1911. [Egg notes]: Oologist, vol. 28, p. 124, July.

Records of eggs of the Mourning Dove and Quail at Plant City.

ELLIS, J. B.

1915. Migratory notes taken fall 1915 by J. B. Ellis, Chokoloskee, Fla.: Oologist, vol. 32, pp. 207, 209, December.

Records of 27 species.

1916. [Extract from letter]: Oologist, vol. 33, p. 24, February.

Mention of capture of an albino Turkey Vulture in Florida.

1917. Forty years ago and now: Oologist, vol. 34, pp. 2–4.

Random notes on Florida bird life and its decreasing numbers.

1918. Ivory-billed Woodpecker not yet extinct: Oologist, vol. 35, pp. 11–12.

Nest found [1917] in green cypress; deserted when a pair of Swallow-tailed Kites built in the tree. [No locality given—probably near Everglade.]

ENGLAND, GEORGE ALLAN

1928. Bird Key: Saturday Evening Post, vol. 201, pp. 14, 15, 85, 86, 88, September 1.

Popular account of the rookery on the Tortugas; 11 photographs.

EVANS, LOGAN I.

1923. An annotated list of birds observed in south Florida: Oologist, vol. 40, pp. 2–8, January.

Notes on 113 species observed in De Soto, Polk, Lee, and Punta Gorda Counties from November, 1920, to July, 1922.

EVERMANN, BARTON WARREN

1886. A list of birds observed at Pensacola, Florida: Orn. and Ool., vol. 11, pp. 81–83, 97–98, June and July.

Annotated list of 93 species observed between March 18 and April 13, 1886.

FARGO, WILLIAM GILBERT

1923. Birds seen in Florida in February, 1923: Bird-Lore, vol. 25, pp. 381–385, December.

1926. Notes on birds of Pinellas and Pasco Counties, Florida: Wilson Bul., vol. 38, pp. 140–155, September.

Annotated list of 184 species.

1927. Feeding station habit of Fish Crow: Auk, vol. 44, p. 566, October.

Fish Crows destroy eggs of Clapper Rail and other species in Wakulla County, Fla.

1928a. Notes on birds of Pinellas and Pasco Counties, Florida: Wilson Bul., vol. 40, pp. 54–55, March.

Notes on 12 species.

1928b. Goshawk on Tampa Bay, Florida: Auk, vol. 45, p. 373, July.

Record of a specimen killed near St. Petersburg, Fla.

1928c. Banding Robins in Florida: Wilson Bul., vol. 40, p. 198, September.

Records of both northern and southern races at Pass-a-Grille, Fla.

1929a. *Crotophaga ani* in Pinellas County, Florida: Auk, vol. 46, pp. 388–389, July.

Record of a specimen collected near Pass-a-Grille in February, 1929.

1929b. The Indian Key bird refuges of Tampa Bay, Florida: Florida Naturalist, vol. 3, pp. 1–10, October.

Notes on 20 species of birds and 6 mammals.

1929c. The Florida Cormorant as observed in Pinellas County, Florida: Wilson Bul., vol. 41, pp. 228–235, figs. 10, 11, December.
Description of breeding and roosting habits.
1930. Canada Geese review a parade of ducks: Wilson Bul., vol. 42, pp. 137–138, June.
Observations by Mrs. M. A. Hall near Wakulla Beach.

FARRAR, CLARENCE D., ERNEST H., AND LUCY E.
1920. Bird-Lore's twentieth Christmas census: Bird-Lore, vol. 22, pp. 33–34, February.
Records of 45 species seen at St. Petersburg, December 24, 1919.

FAY, SAMUEL PRESCOTT
1910. European Widgeon (*Mareca penelope*) in Florida: Auk, vol. 27, pp. 204–205, April.
Record of two specimens taken near Titusville.

FISHER, ALBERT KENRICK
1888. Food of hawks and owls: U. S. Dept. Agr. Ann. Rept. for 1887, pp. 402–422.
1893. The hawks and owls of the United States in their relation to agriculture: U. S. Dept. Agr., Bul. 3, Div. Orn. and Mamm., 210 pp., 26 plates.
Contains numerous records of Florida birds and their food.
1902. Two vanishing game birds: The Woodcock and the Wood Duck: U. S. Dept. Agr. Yearbook for 1901, pp. 447–458.
Woodcock and Wood Duck recorded as breeding in Florida.

FISHER, GEORGE CLYDE
1907. A Purple Martin roost: Wilson Bul., vol. 19, p. 119, September.
Description of a large summer roost at Quincy, Fla.
1908. The eighth Christmas bird census: Bird-Lore, vol. 10, p. 34, February.
List of 18 species seen at Apalachicola, Fla.
1910a. Bird-Lore's tenth Christmas bird census: Bird-Lore, vol. 12, p. 30, February 1.
Record of 22 species seen at De Funiak Springs, Fla.
1910b. Some winter birds about Lake Wimlico, Florida: Wilson Bul., vol. 22, pp. 41–47, March.
List of 49 species, with brief annotations.
1910c. Additional vernacular name for the Flicker (*Colaptes auratus*): Wilson Bul., vol. 22, p. 127, June.
Called "Cotton-backed Yellowhammer" at De Funiak Springs.
1910d. Golden Eagle taken in west Florida: Auk, vol. 27, p. 80, January.
Record of a specimen taken near De Funiak Springs, November 1, 1909.
1910e. Two records of the Goldeneye at De Funiak Springs, Florida: Auk, vol. 27, p. 205, April.
Clangula clangula americana taken in December, 1907, and November, 1909.
1910f. A Bittern taken in west Florida: Auk, vol. 27, pp. 205–206, April.
Botaurus lentiginosus taken near De Funiak Springs.
1910g. Another Golden Eagle taken in west Florida: Auk, vol. 27, p. 206, April.
A specimen (the fourth) taken near De Funiak Springs in February, 1910.
1917. Bird-Lore's seventeenth Christmas census: Bird-Lore, vol. 19, p. 29, February.
Records of 22 species observed at Tallahassee, December 25, 1916.

FISHER, SYDNEY G.
1913. The wonders of Florida: Amer. Field, vol. 79, pp. 73–75, January 25.
General survey of wild life, especially birds, in southern Florida, particularly the Kissimmee Prairie region.

FLANDERS, MABEL
1929. My Mockingbird: Florida Naturalist, vol. 2, pp. 77–78, April.
Habits at Zephyrhills, Fla.

FORBUSH, EDWARD HOWE
1907. Useful birds and their protection: Mass. State Board of Agr., xx + 437 pp., 56 pls.
1909. The Mallard: Bird-Lore, vol. 11, pp. 40–47, February.
Contains record and photograph of Scaup Ducks at Lake Worth.

FORBUSH, EDWARD HOWE (Continued)

1912. A history of the game birds, wild-fowl, and shore birds of Massachusetts and adjacent States: Mass. State Board of Agr., xvi + 622 pp.

1925–1929. Birds of Massachusetts and other New England States: Mass. Dept. Agr., vol. 1, xxxi + 481 pp., pls. 1–33, 1925; vol. 2, l + 461 pp., pls. 34–62, 1927; vol. 3, xlviii + 466 pp., pls. 63–93, 1929.

Contains a number of references to birds seen in Florida and an account (by John B. May) of Forbush's trip to Florida in 1877.

FORD, EDWARD RUSSELL

1922. Notes from Lauderdale, Fla.: Auk, vol. 39, p. 425, July.

Records of the Painted Bunting and the Common Loon at Fort Lauderdale.

"FOREST AND STREAM" (editorial)

1904. In Florida: Forest and Stream, vol. 62, pp. 265, 267, April 2.

Account of Audubon's capture of the Greenshank, with reproduction of his drawing.

FOWLER, HENRY WEED

1906. Birds observed in the Florida Keys: Auk, vol. 23, pp. 396–400, October.

Annotated list of 33 species observed between Cape Sable and the Marquesas Keys, in June, 1904.

FUERTES, LOUIS AGASSIZ

1920. Falconry, the sport of kings: Nat. Geog. Mag., vol. 38, pp. 429–467, December.

GAMBEL, WILLIAM

1848a. [Observations on some birds from Florida, collected by Dr. Heermann]: Proc. Acad. Nat. Sci. Philadelphia, p. 74, August 1.

Record of capture of the Everglade Kite, Black-whiskered Vireo, and Reddish Egret.

1848b. Contributions to American ornithology: Proc. Acad. Nat. Sci. Philadelphia, pp. 126–129, December.

Contains account of discovery of the Everglade Kite at the source of the Miami River, and of the Black-whiskered Vireo at Charlotte Harbor.

GANDER, FRANK FORREST

1922. The Brown-headed Nuthatch: Bird-Lore, vol. 24, pp. 328–330, December.

Account of nesting in Franklin County, Fla., with 2 photographs.

1928. Observations on the feeding habits of some common birds: Condor, vol. 30, pp. 362–363, November.

Note on habits of Palm Warblers at Pensacola, Fla.

1929a. Some rail traits: Auk, vol. 46, p. 106, January.

Habits of the Florida Clapper Rail at Apalachicola, Fla.

1929b. Notes on bird mimicry with special reference to the Mockingbird (*Mimus polyglottos*): Wilson Bul., vol. 41, pp. 93–95, June.

Mockingbirds reported abundant in Escambia County, Fla.

GEDNEY, H. S.

1869. The Loggerhead Shrike: Amer. Naturalist, vol. 3, pp. 159–160, May.

Account of a Loggerhead Shrike killing and feeding on a snake.

GERHARDT, ALEXANDER

1854. Skizzen aus dem Vogelleben Nordamerika's: Naumannia, pp. 192–194.

Running account of birds seen at the mouth of the St. Johns River, February 23, 1854.

GIBBS, ROBERT MORRIS ("SCOLOPAX")

1891a. A trip to Pelican Island: Oologist, vol. 8, pp. 124–125, June.

Condition of the colony on February 17, 1891; 4,000 birds estimated; eggs and young in nests, mostly on the ground—a few in small mangroves.

1891b. Some Florida notes: Oologist, vol. 8, pp. 135–136, July.

Casual mention of several species of birds.

1892. The Brown Pelican: Forest and Stream, vol. 38, p. 296, March 31.
Habits in Florida: description of the rookery in Indian River [Pelican Island], which was visited February 17, 1891, and estimated to contain from 4,000 to 10,000 birds.

1894a. Nesting habits of the Brown Pelican in Florida: Oologist, vol. 11, pp. 81–84, March.
Full account of nesting on Pelican Island; eggs probably laid the last of December.

1894b. Migration of the Chimney Swift: Oologist, vol. 11, p. 204, June.
Dates of arrival at various points in Florida.

1897a. Brown Pelican on Indian River: Osprey, vol. 1, pp. 75–77, February.
Description of Pelican Island Rookery in February, 1891.

1897b. The Sandhill Crane, *Grus mexicana* (Müll.): Oologist, vol. 14, pp. 33–35, March.
Observations made in Florida.

1899. The Sora: Oologist, vol. 16, pp. 151–153, October.

1900. Robins' roosts again: Oologist, vol. 17, p. 55, April.
Describes a large flight of Robins on the shores of the Indian River, Brevard County; believed to roost in mangroves.

1902. Migration of birds: Oologist, vol. 19, pp. 166–168, 177–180, November–December.
Contains notes on migration of the Chimney Swift in Florida.

GOODHUE, ISABEL

1919. The song of the Blue Jay: Auk, vol. 36, pp. 111–112, January.
Description of a song heard at Winter Park, Fla.

GORDON, THEODORE

1891. Carolina Paroquet: Forest and Stream, vol. 37, p. 64, August 13.
Habits in Hillsborough and Hernando Counties in 1878.

1909. Ivory-billed Woodpecker: Forest and Stream, vol. 72, p. 972, June 19.
Mention of an Ivory-billed Woodpecker killed near Otter Creek, and of large flocks of Carolina Paroquets formerly seen in the Gulf Hammock.

GOSS, NATHANIEL STICKNEY

1886. Capture of the Scissor-tailed Flycatcher (*Milvulus forficatus*) on the southeast coast of Florida: Auk, vol. 3, p. 134, January.
Record of a specimen taken at Cape Sable, March 2, 1885.

1888. Feeding habits of *Pelecanus erythrorhynchos:* Auk, vol. 5, pp. 25–27, January.
Habits of the White Pelican, as observed on the southern coast of Florida.

1891. History of the birds of Kansas. 692 pp.

GOSSE, PHILIP HENRY

1847. The birds of Jamaica. London, 447 pp.

GRAHAM, R.

1917. Fishing for Barn Owls in Lake Worth: Oologist, vol. 34, p. 18.
Two Barn Owls taken from hollow stub in lake.

GRAHAM, SAMUEL CECIL

1909. The Ivory-billed Woodpecker: Forest and Stream, vol. 72, p. 892, June 5.
Description of habits and notes of a pair seen near the St. Johns River.

GRANT, BRYAN M.

1895. The Black Vulture: Nidiologist, vol. 3, p. 7, September.
Nesting at Tallahassee.

GREENE, EARLE ROSENBURY

1925a. Bird-Lore's twenty-fifth Christmas census: Bird-Lore, vol. 27, pp. 43–44, February.
List of 27 species seen at Atlantic Beach, December 24, 1924.

1925b. The American Scoter in Florida: Auk, vol. 42, pp. 579–580, October.
Record of one seen at Atlantic Beach.

1928. Bird notes in northeastern Florida: Florida Naturalist, vol. 1, pp. 30–32, January.
Notes on occurrence of 12 species near Jacksonville.

GREGORY, J. U.
1893. A South Carolina Woodcock flight: Forest and Stream, vol. 40, p. 74, January 26.
Reported occurrence of Woodcock at St. Augustine, Fla.

GRIER, WILLIAM D.
1887. Eggs of the Florida Jay: Oologist, vol. 4, p. 76, March–May.
Description of nest and eggs taken on Indian River.

GRIMES, SAMUEL ANDREW
1923. Bird nests I found in 1922 and 1923: Oologist, vol. 40, p. 183, November.
Many breeding records from Florida (without locality or date).
1925. Bird-Lore's twenty-fifth Christmas census: Bird-Lore, vol. 27, pp. 44–45, February.
List of 39 species seen, Jacksonville to Fernandina, December 25, 1924.
1926. Bird-Lore's twenty-sixth Christmas census: Bird-Lore, vol. 28, p. 35, February.
Records of 42 species observed at Jacksonville, December 25, 1925.
1928a. The Yellow-throated Warbler (*Dendroica dominica dominica*): Florida Naturalist, vol. 1, pp. 29–30, January.
Nesting habits at Jacksonville, with a photograph of adult feeding young.
1928b. The Loggerhead Shrike: Florida Naturalist, vol. 1, pp. 48–50; 2 illus., April.
Habits as observed in northern Florida.
1928c. The Carolina Wren: Florida Naturalist, vol. 1, pp. 76–78, July.
Description and photographs of bird and nest [locality not given].
1928d. Is the Wood Thrush a common Florida nester?: Florida Naturalist, vol. 1, p. 88, July.
Record of two nests found 10 miles west of Jacksonville.
1928e. The Blue-gray Gnatcatcher: Florida Naturalist, vol. 2, pp. 25–27, October.
Nesting habits in Duval County, Fla., with photograph of bird on nest.
1929a. The Kingbird in Jacksonville: Florida Naturalist, vol. 2, pp. 50–51, 2 figs., January.
Breeding habits described.
1929b. The Ground Dove: Florida Naturalist, vol. 2, pp. 101–102, 1 photo. July.
Nesting habits near Jacksonville.
1929c. Brown-headed Nuthatch: Florida Naturalist, vol. 3, pp. 20–21, October.
Nesting habits as observed in Florida.
1930a. Bird-Lore's thirtieth Christmas census: Bird-Lore, vol. 32, p. 43, February.
Records of 83 species seen near Jacksonville, December 25, 1929.
1930b. Black Vultures: Florida Naturalist, vol. 3, p. 67, April.
Photograph of a flock in Baker County.
1930c. Snowy Heron at nest: Florida Naturalist, vol. 3, p. 89, July.
Photograph taken in Duval County, Florida.
1930d. Rough-winged Swallow in Duval County: Florida Naturalist, vol. 4, pp. 3–6, 1 photograph October.
Nesting habits near Jacksonville.
1931a. 1930 nesting-season notes from the Jacksonville region: I, Florida Naturalist, vol. 4, pp. 41–48, 4 photographs, January; II, vol. 4, pp. 77–87, July.
Notes on nesting of 80 species.
1931b. Notes on the Orchard Oriole: Florida Naturalist, vol. 5, pp. 1–7, 3 photos, October.
Nesting habits as observed near Jacksonville.

GRINNELL, GEORGE BIRD
1900. American wild fowl and how to take them: IX, Forest and Stream, vol. 55, pp. 366–367, November 10.
Habits of the Florida Duck.
1901. American Duck Shooting. New York. 627 pp.

GRISCOM, LUDLOW (see also Bettle and Griscom)
1916a. Bird-Lore's sixteenth Christmas census: Bird-Lore, vol. 18, p. 31, February.
Records of 95 species observed at Goose Creek (10 miles west of St. Marks, Fla.), December 29, 1915.

1916b. Notes from Leon County, Florida: Auk, vol. 33, pp. 329–330, July.
Records of the Green Heron (winter), Florida Bob-white, and Brown Creeper.

1919. Further notes from Leon County, Florida: Auk, vol. 36, pp. 587–589, October.
Brief notes on occurrence of 15 species.

1922–23. Field studies of the Anatidae of the Atlantic coast: Auk, vol. 39, pp. 517–530, October, 1922; vol. 40, pp. 69–80, January, 1923.

GRISCOM, LUDLOW, GRISCOM BETTLE, AND LEVERETT SALTONSTALL

1912. Bird-Lore's twelfth Christmas bird census: Bird-Lore, vol. 14, p. 33, February.
Records of 70 species observed at Horseshoe Plantation, 16 miles northwest of Tallahassee, Fla., December, 1911.

GRISCOM, LUDLOW, AND M. S. CROSBY

1922. Bird-Lore's twenty-second Christmas census: Bird-Lore, vol. 24, p. 27, February.
Records of 109 species seen at East Goose Creek, Wakulla County, December 30, 1921.

GRISCOM, LUDLOW, AND J. T. NICHOLS

1920. A revision of the Seaside Sparrows: Abstr. Proc. Linn. Soc. New York, no. 32, pp. 18–30, November 3.
Contains original description of *Passerherbulus maritimus juncicola*, type from East Goose Creek, Wakulla County, Fla. and of *P. m. howelli*, from Dauphine Island, Ala.; also numerous other Florida records.

GROSS, ALFRED OTTO

1912. Observations on the Yellow-billed Tropic-Bird (*Phaëthon americanus* Grant) at the Bermuda Islands: Auk, vol. 29, pp. 49–71, January.
Contains record of a specimen from the Banana River, Fla.

1923. The Black-crowned Night Heron (*Nycticorax nycticorax naevius*) of Sandy Neck: Auk, vol. 40, pp. 191–214, April.
Lists specimens examined from Tarpon Springs, Eau Gallie, and the Dry Tortugas (pp. 206, 207).

GUDGER, EUGENE WILLIS

1929. How the Laughing Gull, the feathered buccaneer of Florida waters, gets its dinner: Scientific Monthly, vol. 29, pp. 435–439, 3 illus., November.
Habits of the Laughing Gull and the Brown Pelican, as observed on the Tortugas.

GUNN, CHARLES W.

1882. A collector in Florida: Orn. and Ool., vol. 7, pp. 103–104, March.
Notes on water birds on the Indian River.

GURNEY, JOHN HENRY

1876. Notes on a catalogue of the Accipitres in the British Museum by R. Bowdler Sharpe (1874): Ibis, vol. 6 (ser. 3), pp. 230–243.
Contains remarks on a specimen of *Buteo borealis* from Florida and on the Florida race of *Buteo lineatus*.

1879. Notes on a catalogue of the Accipitres in the British Museum by R. Bowdler Sharpe (1874): Ibis, vol. 3 (ser. 4), pp. 330–341.
Contains synonymy of *Rostrhamus sociabilis plumbeus*.

1881. Notes on a catalogue of the Accipitres in the British Museum by R. Bowdler Sharpe: Ibis, vol. 5 (ser. 4), pp. 547–567.
Contains remarks on *Tinnunculus isabellinus* and *T. sparverioides*, accredited to Florida.

1882. On some raptorial birds recently acquired by the Norwich Museum: Ibis, vol. 6 (ser. 4), pp. 452–457.
Contains remarks on the Everglade Kite, with measurements.

"H., J. S."

1884. Late nesting—Ground Dove: Young Oologist, vol. 1, p. 87, October.
Record of a nest found on September 11 at Tampa, Fla.

HADLEY, ALDEN HERVEY

1931. With Fuertes in Florida: Amer. Forests, vol. 37, pp. 71–73, 128, February.
Account of a trip in 1898 with Louis A. Fuertes, Charles R. Knight, Abbott and Gerald Thayer to the headwaters of the St. Johns River, with mention of many birds seen.

HALL, HENRY MARION

1917. A rare nest from the Florida Everglades: Forest and Stream, vol. 87, p. 217, May.
Description of a Limpkin's nest with a photograph taken by Thomas A. Edison and his son.

HALLINAN, THOMAS

1922a. Nighthawk (*Chordeiles virginianus*) roosting on flagpole: Auk, vol. 39, p. 568, October.
Habits at Jacksonville, Fla.

1922b. Bird interference on high tension electric transmission lines: Auk, vol. 39, p. 573, October.
Notes on Turkey Vultures, Florida Crows, and Loggerhead Shrikes killed by electric wires at Jacksonville.

1922c. Scarcity of breeding birds in Duval County, Florida: Auk, vol. 39, p. 573–574, October.
Contains records of nesting of the Fish Hawk at New Berlin, and the Brown Thrasher at Orange Park.

HALLMAN, ROY CLINE

1928. Black-necked Stilt: Florida Naturalist, vol. 2, p. 31, October.
Several records of the Stilt in Florida.

1929a. Great White Heron: Florida Naturalist, vol. 2, pp. 78–79, April.
Record of one seen on Anastasia Island.

1929b. A nest of Great Horned Owls: Florida Naturalist, vol. 2, pp. 99–100, July.
Nesting and food habits as observed near St. Augustine.

1929c. Black-necked Stilts nesting on the Atlantic coast, St. Johns County, Florida: Oologist, vol. 46, p. 87, July.
Nests found in May and June, 1928.

1929d. Black-necked Stilt and American Oystercatcher: Florida Naturalist, vol. 3, p. 24, October.
Breeding records from St. Johns County.

1930a. Hawks and owls: Florida Naturalist, vol. 3, pp. 76–77, April.
Nest of Harlan [?] Hawk and Great Horned Owl, the latter on the ground.

1930b. Notes on the Least Bittern: Florida Naturalist, vol. 3, pp. 65–66, April.
Breeding habits described, with a photograph of nest and eggs.

1930c. Notes on the American Oystercatcher: Oologist, vol. 47, p. 68, June.
Two nests found near St. Augustine, Fla.

1930d. Nesting habits of the Black Vulture: Florida Naturalist, vol. 4, pp. 13–14, 2 photos, October.
Notes from St. Johns and Polk Counties.

1931. Notes from St. Johns County: Florida Naturalist, vol. 4, pp. 50–51, January.
Records of nesting of Cooper's Hawk, Belted Kingfisher, and Rough-winged Swallow.

HALLOCK, CHARLES.

1876. Camp Life in Florida. 348 pp.
Contains an annotated list of 62 species of birds found in the Lake Okeechobee region; also a chapter on the Okeechobee expedition of 1874, by "Fred Beverly" [F. A. Ober], wherein is mentioned the reported occurrence of Whooping Cranes on the "Alligator Flats," about 20 miles from Fort Capron.

HANDLEY, CHARLES OVERTON (see Stoddard and Handley)

HARDISTY, ARTHUR HENRY

1929. My first and only set of Sandhill Crane eggs: Oologist, vol. 46, pp. 87–88, June.
Description of a nest found near Melbourne.

HARPER, FRANCIS

1914. A fortnight in the Okefenokee: Abstr. Proc. Linn. Soc. New York, no. 25, p. 35, April 15.

1920. The song of the Boat-tailed Grackle: Auk, vol. 37, pp. 295–297, April.
Studies made at Mayport and Fernandina, Fla.

HARPER, ROLAND MCMILLAN

1910. Preliminary report on the peat deposits of Florida: Florida State Geol. Surv. 3d. Ann. Rept., pp. 197–375.

1914. Geography and vegetation of northern Florida: Florida State Geol. Surv. 6th Ann. Rept., pp. 163–451.

1921. Geography of central Florida: Florida State Geol. Surv. 13th Ann. Rept., pp. 71–307.
Contains a few remarks on Florida birds (pp. 226–230).

1927. Natural resources of southern Florida: Florida State Geol. Surv. 18th Ann. Rept., pp. 27–206.
Detailed description of vegetation; casual remarks on bird life.

HARRIS, EDWARD

1845. [A specimen of *Cymindis hamatus* (= *Rostrhamus sociabilis*) from Florida]: Proc. Acad. Nat. Sci. Philadelphia, 1844 [July, 1845], p. 65.
First record of the Everglade Kite in Florida—a specimen taken on the Miami River in April, 1844.

HARRIS, HARRY

1928. Robert Ridgway: Condor, vol. 30, pp. 5–118, February.
Contains accounts of Ridgway's explorations in Florida.

HARTLAUB, GUSTAV, AND OTTO FINSCH

1872. On a fourth collection of birds from the Pelew and Mackenzie Islands: Proc. Zool. Soc. London, pp. 87–114.
Contains original description of *Puffinus auduboni* [= *P. lherminieri*]; type from Cape Florida.

HASBROUCK, EDWIN MARBLE

1885a. Bird life in Florida: Scientific American, vol. 52, p. 133, February 28.
Notes on birds collected at Palatka.

1885b. Florida bird life: Orn. and Ool., vol. 10, pp. 4–5, 20–21, 41–42, 74–75, January, February, March, May.
Field notes on numerous species observed in the St. Johns River region, near Palatka.

1885c. Migration in Florida: Scientific American, vol. 52, p. 241, April 18.
Notes on the spring migration at Palatka in March.

1889. Restoration of an Audubonian form of *Geothlypis trichas* to the American avifauna: Auk, vol. 6, pp. 167–168, April.
Geothlypis trichas roscoe revived for the southern Yellowthroat.

1891a. The present status of the Ivory-billed Woodpecker (*Campephilus principalis*): Auk, vol. 8, pp. 174–186, April.
Contains notes on habits and many records of occurrence in Florida.

1891b. The Carolina Paroquet (*Conurus carolinensis*): Auk, vol. 8, pp. 369–379, October.
Contains a summary of recent records of the species in Florida.

1893. The geographical distribution of the genus *Megascops* in North America: Auk, vol. 10, pp. 250–264, July.
Contains records of the Florida Screech Owl from Gainesville, Indian River, Palatka, and the Caloosahatchee River.

HATCH, PHILO LUOIS

1892. Notes on the birds of Minnesota: Geol. and Nat. Hist. Surv. of Minnesota, First Ann. Rept. State Zoologist, 487 pp., June.

HAWES, C. ALGER

1878. Nesting of the Mockingbird (*Mimus polyglottus*): Oologist (Willard's), vol. 3, pp. 75–76, December.
Eggs found at Jacksonville, January 7 and 10.

HAY, OLIVER PERRY

1902. On the finding of the bones of the Great Auk (*Plautus impennis*) in Florida: Auk, vol. 19, pp. 255–258, July.
Account of discovery of bones in a shell heap at Ormond.

HEADE, MARTIN J. ("DIDYMUS")

1891. Florida Hummingbirds: Forest and Stream, vol. 36, p. 455, June 25.
Numbers killed at St. Augustine by a late frost in spring of 1890.

1892a. Taming Hummingbirds: Forest and Stream, vol. 38, p. 348, April 14.
Habits at St. Augustine, Fla.

1892b. Butcher-birds and hawks: Forest and Stream, vol. 38, p. 589, June 23.
Habits of the Loggerhead Shrike at St. Augustine, Fla.

1893. Some feathered scalawags: Forest and Stream, vol. 40, p. 425, May 18.
Habits of Shrikes, Blue Jays, and Pigeon Hawk at St. Augustine, Fla.

1894. Hummingbird pets: Forest and Stream, vol. 43, p. 137, August 18.
Taming the birds at St. Augustine, Fla.

1895. The Bluebirds: Forest and Stream, vol. 45, p. 422, November 16.
Notes from St. Augustine on Bluebird scarcity; English Sparrow said to be absent.

HEILPRIN, ANGELO

1887. Explorations on the west coast of Florida and in the Okeechobee wilderness: Wagner Free Inst. of Science (Philadelphia), viii + 134 pp., May.
Casual mention of several birds, including Paroquets and the Roseate Spoonbill.

HELME, ARTHUR HUDSON

1913. [Notes on Florida birds]: Abstr. Proc. Linn. Soc. New York, no. 21, p. 15, February.
Notes on Robins and Brown Pelicans.

HELMUTH, WILLIAM TOD

1920. Extracts from notes made while in Naval service: Auk, vol. 37, pp. 255–261, April.
Contains a number of records of birds seen along the coasts of Florida in 1917 and 1918.

HENDRY, F. A.

1900. Florida curlews: Forest and Stream, vol. 55, p. 45, July 21.
Notes on the "white curlew" [= White Ibis] and "pink curlew" [= Roseate Spoonbill] at Fort Thompson.

HENNINGER, WALTHER FRIEDRICH

1917. The diary of a New England ornithologist: Wilson Bul., vol. 29, pp. 1–17, March.
Contains account by Dr. Erwin I. Shores of a trip to Indian River and Lake Okeechobee in 1874.

HENSHALL, JAMES ALEXANDER

1879. A winter in east Florida: Forest and Stream, vol. 13, pp. 663, 683, 703, 724, 743, 763, 783, 803, 823.
Contains a few casual references to birds seen on the east coast from Titusville to Biscayne Bay.

1884. Camping and cruising in Florida. xvi + 248 pp.
Contains a list, without annotations, of 133 species of birds "observed by the author in Florida."

1889. Florida birds of plume: Forest and Stream, vol. 32, p. 316, May 9.
Statement from Dr. J. A. Henshall that Egrets and Spoonbills are very scarce on the southern coast of Florida.

HENSHAW, HENRY WETHERBEE

1880. Maynard's Birds of eastern North America [review]: Bul. Nuttall Orn. Club, vol. 5, pp. 170–173, July.

1919–1920. Autobiographical notes: Condor, vol. 21, pp. 102–107, 165–171, 177–181, 217–222; vol. 22, pp. 3–10, 55–60, 95–101; May, 1919–May, 1920.
Contains (vol. 21, pp. 168–170) account of the author's collecting trip in Florida in 1870–71.

HERRICK, FRANCIS HOBART

1917. Audubon the naturalist: A history of his life and times. Vol. 1, xl + 451 pp.; vol. 2, xiii + 494 pp.
Volume 2 contains a chapter on Audubon's explorations in Florida.

HOLDER, CHARLES FREDERICK

1892. Along the Florida Reef.
Popular account of a visit to the Tortugas, with brief mention of a few birds seen.

HOLDER, JOSEPH BASSETT

1874a. The Frigate-bird—its remarkable powers of soaring: Amer. Sportsman, vol. 3, p. 276, January 31.
Habits as observed in Florida.

1874b. The Brown Pelican and its home: Amer. Sportsman, vol. 3, p. 390, March 21.
Habits as observed on the Tortugas.

HOLLISTER, NED

1893. Floridan races: Oologist, vol. 10, pp. 176–178, June.
Remarks on numerous species from Florida.

1925. Another record of the Ruddy Quail-Dove at Key West: Auk, vol. 42, p. 130, January.
Record of a bird caught alive in May, 1923, and later sent to the National Zoological Park.

HOLT, ERNEST GOLSAN

1924. Flamingoes (*Phoenicopterus ruber*) in Florida: Auk, vol. 41, pp. 598–599, October.
Record of 3 birds seen in Florida Bay.

1925. Type locality of *Ardea herodias wardi* Ridgway: A correction: Auk, vol. 42, pp. 266–267, April.
Type locality shown to be Estero Bay, Fla.

1928. The status of the Great White Heron (*Ardea occidentalis* Audubon) and Würdemann's Heron (*Ardea würdemannii* Baird): Cleveland Mus. Nat. Hist., Sci. Pub., vol. 1, pp. 1–35, pls. 1–6, July 28.
Results of field studies on the Florida Keys with measurements and descriptions of specimens.

1929. In the haunts of the Wood Ibis; Wilson Bul., vol. 41, pp. 3–18, 1 plate, 14 figs., March.
Account of a trip from Royal Palm Hammock to Cape Sable and 'Gator Lake, Fla.

1930. Nesting of the Sandhill Crane in Florida: Wilson Bul., vol. 42, pp. 163–183; 15 figs., September.
Original observations on the Kissimmee Prairie.

HOLT, E. G., AND G. M. SUTTON

1926. Notes on birds observed in southern Florida: Ann. Carnegie Mus., vol. 16, pp. 409–439; plates 39–44, April 10.
List of 123 species, with notes on habits; colored plate of *Ammospiza mirabilis*.

HOPKINS, CHARLES LINSLEY

1888. Notes relative to the sense of smell in the Turkey Buzzard (*Cathartes aura*): Auk, vol. 5, pp. 248–251, July.
Observations made in southern Florida.

HOWE, REGINALD HEBER, JR.

1901. A study of the genus *Macrorhamphus:* Auk, vol. 18, pp. 157–162, April.
Long-billed Dowitcher said to be common in Florida, especially in November and February.

1902. The Labrador Savanna Sparrow: Auk, vol. 19, pp. 85–86, January.
Contains record of a specimen from Kissimmee referred to *Passerculus savanna labradorius* Howe.

1903a. A note on the Florida Phoebe: Proc. Biol. Soc. Washington, vol. 16, p. 51, March 19.
The Phoebe considered resident in southern Florida; suggests the pertinence of *Muscicapa lembeyi* Gundlach, "provided it is thought the form deserves to be recognized at all."

1903b. A North American faunal index to The Ornithologist and Oologist, Part. II: Contrib. North Amer. Orn., vol. 1, pp. 33–38, January 31.
Contains list of papers relating to Florida.

1903c–1904a. A list of the birds of Florida: Contrib. North Amer. Orn., vol. 1, pp. 39–44, 53–58, May 7, June 10, 1903; January 6, 1904.
Annotated list of 17 species [never completed].

HOWE, REGINALD HEBER, JR. (Continued)

1904b. The Ani in Florida: Auk, vol. 21, p. 79, January.
Record of a specimen of *Crotophaga ani* taken in Brevard County.

1904c. A new Bob-white from the United States: Proc. Biol. Soc. Washington, vol. 17, p. 168, December 27.
Original description of *Colinus virginianus insulanus;* type from Key West.

HOWE, R. H., AND LE ROY KING

1902. Notes on various Florida birds: Contrib. North Amer. Orn., vol. 1, pp. 25–32, May 21.
Field notes on 27 species, including the Flamingo; original descriptions of *Cerchneis sparverius paulus*, type from Miami; and of *Myiarchus crinitus residuus*, type from Istokpoga Lake.

HOWELL, ARTHUR HOLMES

1918. A Crested Flycatcher injured by swallowing a grasshopper: Auk, vol. 35, pp. 354–355, July.
Note on a specimen picked up in Royal Palm Hammock.

1919. Description of a new Seaside Sparrow from Florida: Auk, vol. 36, pp. 86–87, January.
Original description of *Thryospiza mirabilis;* type from Cape Sable.

1921. A list of the birds of Royal Palm Hammock, Florida: Auk, vol. 38, pp. 250–263, April.
Annotated list of 128 species.

1924. Birds of Alabama: Dept. Game and Fisheries, Montgomery, Ala., 384 pp.

1930a. A naturalist's cruise on the Gulf coast: Florida Naturalist, vol. 3, pp. 29–37, January.
Popular account of a trip from Pensacola to Cedar Keys, with notes on some birds seen.

1930b. Description of a new subspecies of the Prairie Warbler, with remarks on two other unrecognized Florida races: Auk, vol. 47, pp. 41–43, January.
Original description of *Dendroica discolor paludicola*, type from Anclote Key; remarks on status of *Dendroica pinus florida* and *Sitta pusilla caniceps*.

1930c. Five additions to the birds of Florida: Auk, vol. 47, pp. 96–97, January.
Records of occurrence of the Pomarine Jaeger, Iceland Gull, Greater Shearwater, Northern Phalarope, and Snow Bunting.

HOWELL, ARTHUR H., AND A. J. VAN ROSSEM

1928. A study of the Red-winged Blackbirds of southeastern United States: Auk, vol. 45, pp. 155–163, April.
Original descriptions of *Agelaius phoeniceus littoralis*, type from Santa Rosa Island; and *A. p. mearnsi*, type from Alligator Bluff, Kissimmee River; records of *A. p. phoeniceus* from Gainesville and *A. p. floridanus* from southern Florida.

HOWELL, JOSEPH CORWIN, JR.

1927. A Florida birthday: Oologist, vol. 44, pp. 89–90, July.
Nesting of the Crow, Red-shouldered Hawk, etc., on the Kissimmee Prairie.

1928a. Albino Florida Blue Jay: Oologist, vol. 45, p. 49, April.
One seen at Orlando, Fla.

1928b. Nesting habits of the Dusky Seaside Sparrow: Oologist, vol. 45, pp. 105–106, July.
Description of nests and eggs—no locality mentioned.

1928c. Exceptional sets and nests: Oologist, vol. 45, pp. 138, 140, October.
Notes on nesting of 10 species in Florida.

1930. Florida notes: Oologist, vol. 47, pp. 114–115, September.
Nesting records of 7 species.

1931. Orlando notes: Florida Naturalist, vol. 4, p. 50, January.
Migration records of 8 species.

HOWELL, W. H.

1903. Wild Turkeys in south Florida: Sportsman's Review, vol. 23, p. 264.
Notes on a hunt "about 15 miles south of the Caloosahatchee River."

HOXIE, WALTER JOHN ("HUSKEE HADKI")

1889a. Nesting of the Florida Burrowing Owl: Orn. and Ool., vol. 14, pp. 33–34, March.
Observations made on the Kissimmee Prairie.

1889b. Parakeets: Orn. and Ool., vol. 14, pp. 51–52, April.
A flock observed near Lake Okeechobee.
1889c. A day in the Alpataochee: Orn. and Ool., vol. 14, pp. 103–104, July.
Experiences in the Hapatiokee Flats, St. Lucie County; mention of many birds seen.
1889d. The Florida Jay (*Aphelocoma floridana*): Orn. and Ool., vol. 14, pp. 134–135, September.
Habits, as observed at Cape Canaveral.
1889e. [Florida Burrowing Owl]: Orn. and Ool., vol. 14, p. 160, October.
Description of the nest burrow.
1890. On the Fort Bassenger trail: Orn. and Ool., vol. 15, p. 107, July.
Numerous birds seen on the Kissimmee Prairie.

HOYT, ROBERT DAY

1877. The Woodcock in Florida: Forest and Stream, vol. 8, p. 129, April 5.
Record of capture of a brood of young taken near Jacksonville. Note by the editor of hundreds of Woodcock killed near St. Augustine.
1905a. Nesting of the Ivory-billed Woodpecker in Florida (*Campephilus principalis*): Warbler (2d series), vol. 1, pp. 52–55, 1 plate.
Two sets of eggs taken in Lake County in 1905.
1905b. Nesting of Ward's Heron (*Ardea herodias wardi*): Warbler (2d series), vol. 1, pp. 114–115.
Records from Hillsborough County, Fla.
1906. Nesting of the Roseate Spoonbill in Florida: Warbler, vol. 2, pp. 58–59.
Nesting at Cape Sable, March 22, 1906.
1918a. The American Robin in its northern migration, February 15, 1915, in Pinellas County, Fla.: Oologist, vol. 35, pp. 6, 7, January.
Two photographs of Robins.
1918b. Robins in Pinellas County, Florida: Oologist, vol. 35, pp. 24–25 [2 photographs in vol. 34, pp. 6, 7, 1917].
Thousands at Seven Oaks, February 9 to 16, 1915, feeding on camphor berries.

HUEY, LAURENCE MARKHAM

1927. A Pacific Coast race of the Yellow-crowned Night Heron: Condor, vol. 29, pp. 167–168, May.
Records of the Yellow-crowned Night Heron from the Suwannee River and Key West, Fla.

HULST, F. ADEE

1893. The Loggerhead Shrike in Florida: Oologist, vol. 10, pp. 79–80, March.
Notes on habits.

"HUSKEE HADKI" (see Hoxie, W. J.)

INGERSOLL, SEYMOUR RACE

1922. Bird-Lore's twenty-second Christmas census: Bird-Lore, vol. 24, pp. 27–28, February.
Records of 42 species seen at New Smyrna, December 23, 1921.
1928a. Two rare birds at New Smyrna: Florida Naturalist, vol. 1, pp. 28–29, January.
Records of the Slate-colored Junco and Yellow-headed Blackbird.
1928b. The herons and allied birds of the Mosquito Inlet Bird Reservation: Florida Naturalist, vol. 1, pp. 54–55, April.
Notes on occurrences of 10 species.
1928c. Crows and a feather: Florida Naturalist, vol. 2, p. 30, October.
Habits as observed at New Smyrna, Fla.
1930. Bird migration in Volusia County: Florida Naturalist, vol. 3, pp. 90–92, July.
Notes on many species seen at New Smyrna in 1929 and 1930.
1931a. October birds: Florida Naturalist, vol. 4, p. 49, January.
Records of 49 species seen near New Smyrna, October 18, 1930.
1931b. Baltimore Oriole at New Smyrna in January: Florida Naturalist, vol. 4, p. 66, April.

"J., J. T."

1885. Broad-winged Hawk: Young Oologist, vol. 2, p. 20, May.
Record of a nest with 4 eggs, found on shore of Lake Harney.

JACKSON, THOMAS HOOPES

1887a. Notes on a few of the birds observed in Brevard County, Florida: Orn. and Ool., vol. 12, pp. 143–144, September.
Habits of the Florida Jay, Bald Eagle, etc.

1887b. The Limpkin and its nest and eggs: Orn. and Ool., vol. 12, pp. 159–160, October.
Habits as observed on the Oklawaha River.

1888. Nesting of the Florida Burrowing Owl: Orn. and Ool., vol. 13, p. 137, September.
Description of nest and eggs.

1911. The Pileated Woodpecker: Forest and Stream, vol. 76, p. 91, January 21.
Habits as observed in Florida, with photograph of the bird's work on a dead tree.

1912a. Brown Pelicans at St. Petersburg, Florida [photograph]: Bird-Lore, vol. 14, p. 192.

1912b. Bird preservation in Florida: Forest and Stream, vol. 79, p. 300, September 7.
Account of bird conditions in the Tampa Bay region and at Orange Lake.

JACOBS, JOSEPH WARREN

1908. Bald Eagle and Great Horned Owl occupying same nest: Wilson Bul., vol. 20, pp. 103–104, June.
Description of a nest found in De Soto County, Fla.

JAMISON, HARRY KEIM

1890. Nesting of the Whippoorwill [= Chuck-will's-widow]: Orn. and Ool., vol. 15, pp. 182–183, December.
Habits of *Antrostomus carolinensis*, as observed at Sarasota Bay.

1891. Some rookeries on the Gulf coast of Florida: Auk, vol. 8, p. 233, April.
Description of rookeries in Charlotte Harbor, Captiva Pass, and south of Cape Romano.

[JENCKS, FREDERICK TINGLEY]

1884. The Roseate Spoonbill in Florida Rookeries: Random Notes on Natural History (Providence, R. I.), vol. 1, nos. 3, 4, 5, 6, March–June.
Nesting habits of the Roseate Spoonbill and of various herons near Indian River Inlet in 1874.

JENKS, JOHN WHIPPLE POTTER

1887. Hunting in Florida in 1874: Forest and Stream, vol. 29, pp. 323–325, 344–345, 362; 384–385, 402–403, 424–425; November and December.
Account of an expedition to Lake Okeechobee and the Everglades; contains a number of references to birds seen during a 50-days' sojourn.

JOB, HERBERT KEIGHTLEY (see also Bent and Job)

1904. [Letter outlining a trip made to the Dry Tortugas in May, 1903]: Auk, vol. 21, pp. 126–127, pls. 14 and 15, January.
Brief description of conditions on Bird Key, with two photographs of Sooty Terns.

1905. Wild wings. Adventures of a camera-hunter among the larger wild birds of North America on sea and land. xxiv + 336 pp., May.
Contains extended accounts of birds observed in southern Florida, with many original photographs.

1915. Motion pictures for the National Association [of Audubon Societies]: Bird-Lore, vol. 17, pp. 410–412, 1 pl., October.
Report of visits to Orange Lake and the west coast, from Tampa Bay to Key West and the Tortugas. Photograph of Sooty and Noddy Terns and Man-o'-war birds.

"JOE"

1877. [Letter from St. Augustine, Fla.]: Forest and Stream, vol. 8, p. 57, April 19.
Mentions shooting of 43 English Snipe on one day, and 82 on another.

JONES, LYNDS

1895. Record of the work of the Wilson Chapter for 1893 and 1894 on the Mniotiltidae: Wilson Orn. Chap. Bul. 4, 21 pp., January 15.
Contains a few records of birds noted at Starke, Fla., by Ned Hollister.

JOYCE, EDWARD R.

1912. A bird refuge: Forest and Stream, vol. 79, p. 143, August 3.
Photograph of pelicans on Pelican Island.

JUDD, SYLVESTER DWIGHT

1896. Four common birds of the farm and garden: U. S. Dept. Agr. Yearbook for 1895, pp. 405–418.

1898. The food of shrikes: U. S. Dept. Agr. Biol. Survey Bul. 9, pp. 15–26.
Contains notes on food habits of the Loggerhead Shrike in Florida.

1901. The relation of sparrows to agriculture: U. S. Dept. Agr. Biol. Survey Bul. 15, 98 pp., 4 plates.

1905. The bob-white and other quails of the United States in their economic relations: U. S. Dept. Agr. Biol. Survey Bul. 21, 66 pp., 2 plates.
Contains data on the food habits of the Bob-white in Florida.

KALMBACH, EDWIN RICHARD (see also Beal, McAtee, and Kalmbach)

1916. Winter Crow roosts: U. S. Dept. Agr. Yearbook for 1915, pp. 83–100.
Contains record of roosts at De Funiak Springs, Orange Lake, and St. Marks.

1918. The Crow and its relation to man: U. S. Dept. Agr. Bul. 621, 92 pp., February 16.
Contains a note on Crows attacking oranges at Orlando.

KALMBACH, E. R., AND IRA N. GABRIELSON

1921. Economic value of the Starling in the United States: U. S. Dept. Agr. Bul. 868, pp. 1–66, 4 plates, 3 text figs.

KECK, J. M.

1903. Some birds of Florida: Wilson Bul., vol. 10, pp. 65–68, June.
Annotated list of 91 species observed at Fruitland Park.

KELLS, WILLIAM LAWRENCE

1901. Cory's Least Bittern (*Botaurus neoxenus* Cory): Ottawa Naturalist, vol. 15, pp. 67–70, June.
Records of specimens taken at Toronto, Canada, and in Florida.

"KELPIE"

1906. Spring in Florida: Forest and Stream, vol. 66, p. 749, May 12.
Records of the Purple Martin and Hummingbird at Tarpon Springs.

1911a. Florida Martins: Forest and Stream, vol. 76, p. 172, February 4.
Notes arrival of Martins at Tarpon Springs, January 25, 1910.

1911b. Martins in Florida: Forest and Stream, vol. 76, p. 292, February 25.
Notes arrival of Martins at Tarpon Springs, February 3, 1911.

1911c. Purple Martins: Forest and Stream, vol. 77, p. 219, August 5.
Notes departure of Martins from Tarpon Springs, July 14, 1911.

1911d. Jays and Hummingbirds: Forest and Stream, vol. 77, p. 683, November 4.
Brief notes on habits as observed at Tarpon Springs.

1912. Attracting the birds: Forest and Stream, vol. 78, p. 535, April 27.
Brief notes on birds seen at Tarpon Springs.

KENNARD, FREDERIC HEDGE

1915a. On the trail of the Ivory-bill: Auk, vol. 32, pp. 1–14; plates i–iii, January.
Account of a collecting trip in Lee County; one Ivory-bill secured.

1915b. The Okaloacoochee Slough: Auk, vol. 32, pp. 154–166; plates xiii–xv, April.
Account of a collecting trip in Lee County.

KING, FRANKLIN HIRAM

1883. Economic relations of Wisconsin birds: Geology of Wisconsin, vol. 1, pp. 441–610.

KING, LEROY (see Howe and King)

KLINE, H. A.

1886a. [Purple Martins]: Forest and Stream, vol. 26, p. 124, March 11.
Arrival at Tallahassee, Fla.

1886b. Ivory-billed Woodpecker: Forest and Stream, vol. 26, p. 163, March 25.
Record of a specimen taken on the St. Marks River, Fla.

KLINE, H. A. (Continued)

1887a. Florida bird notes: Forest and Stream, vol. 28, pp. 43–44, February 10, pp. 412–413, June 2.
Habits of herons, egrets, Roseate Spoonbill, Ivory-billed Woodpecker, and other species observed near St. Marks; presents a good picture of the abundant bird life on the Gulf coast at that date.

1887b. Florida bird notes: Forest and Stream, vol. 27, p. 484, January 13.
Breeding habits of the Bald Eagle and other Raptores.

KOCH, AUGUST

1888. Zwei Monate in west Florida: Mittheil. Orn. Verein Wien, vol. 12, pp. 1–4, 25–26, January and February.
Account of a trip to the Apalachicola River region, with mention of many birds seen.

1896. Color of the Scarlet Tanager: Forest and Stream, vol. 47, p. 43, July 18.
Mention of a bird seen at Apalachicola.

1899. Capture of the Black Seaside Finch (*Ammodramus nigrescens*) in 1889: Auk, vol. 16, pp. 277–278, July.
Specimens taken near Indianola.

KOCH, AUGUST, AND J. M. MCCRARY

1891. The Carolina Paroquet in Florida: Forest and Stream, vol. 37, p. 183, September 24.
Habits and account of specimens taken near the Apalachicola River in 1889.

KUERZI, JOHN FRANCIS

1931. Note on the occurrence of *Ajaia ajaja* and some other species in Florida: Auk, vol. 48, pp. 114–116, January.
Notes from Collier County and the Kissimmee Prairie.

KUMLIEN, LUDWIG, AND NED HOLLISTER

1903. The Birds of Wisconsin: Bul. Wisconsin Nat. Hist. Soc., vol. 3 (n. s.), nos. 1, 2, 3, January, April, July, pp. 1–143.

KUSER, DRYDEN AND CYNTHIA

1923. Bird-Lore's twenty-third Christmas census: Bird-Lore, vol. 25, pp. 28–29, February.
List of 35 species observed at Palm Beach, December 25, 1922.

LANCASTER, I.

1885. The problem of the soaring bird: Amer. Naturalist, vol. 19, pp. 1055–1058, 1162–1171, November and December.
Observations made in southern Florida, chiefly on Frigate Birds, Buzzards, and Cranes.

1886. The torture of the Fish-hawk: Amer. Naturalist, vol. 20, pp. 223–230, March.
Habits of the Osprey on the west coast of Florida and account of one worried to death by a Frigate Bird.

LANGILLE, JAMES HIBBERT

1884. Our birds in their haunts. 618 pp.

LASHLEY, KARL SPENCER (see also Watson and Lashley)

1915. Notes on the nesting activities of the Noddy and Sooty Terns: Carnegie Inst. Washington, Papers from the Dept. Marine Biol. (pub. 211), vol. 7, pp. 61–83, pl. 7.
Experiments carried on at the Tortugas in May and June, 1913.

LAURENT, PHILIP

1887. Notes on the birds of Levy County, Florida: Orn. and Ool., vol. 12, pp. 157–159, October.
List of 75 species, with annotations, seen in the Gulf Hammock.

1906. Bird notes from a Florida porch: Bird-Lore, vol. 8, p. 67.
Nominal list of 26 species seen in the Gulf Hammock, in March, 1904.

1917. My Ivory-billed Woodpecker: Oologist, vol. 34, pp. 65–67.
Pair taken in the Gulf Hammock, Levy County, March 16, 1887; thinks none have been seen there in 25 years [=1892].

LAWRENCE, GEORGE NEWBOLD

1847a. [Description of a new species of *Procellaria* from Florida]: Ann. Lyc. Nat. Hist. New York, vol. 4, nos. 8, 9, April (on inside back cover).

Original description of *Procellaria brevirostris;* name found to be preoccupied, and the species later renamed *P. meridionalis.*

1847b. Description of a new species of Procellaria: Ann. Lyc. Nat. Hist. New York, vol. 4, pp. 475–476; 1848 [=July, 1847].

Original description of *Procellaria meridionalis* [=*Pterodroma hasitata*] based on a specimen from Indian River Inlet, Fla.

1851. Additions to North American ornithology; No. 1: Ann. Lyc. Nat. Hist. New York, vol. 5, pp. 117–119, May.

Record of capture of *Thallassidroma fregetta* [*Fregetta leucogastris*] at St. Marks, Fla.

1864. Catalogue of birds collected at the island of Sombrero, W. I., with observations by A. A. Julien: Ann. Lyc. Nat. Hist. New York, vol. 8, pp. 92–106.

Contains record (p. 104) of a specimen of *Haliplana* [*Sterna*] *fuliginosa* from the coast of Florida.

LAWRENCE, ROBERT HOE

1891. A breeding place of *Pelecanus fuscus:* Auk, vol. 8, pp. 231–232, April.

Notes on a visit to Pelican Island in the Indian River in March, 1882.

LE BARON, J. FRANCIS ("AL. I. GATOR")

1876. The naturalist and sportsman in Florida: Rod and Gun and Amer. Sportsman, vol. 9, pp. 21–22, 39, 53–54, 69–70, 83–84, 97–98, 113–115, October–November.

Account of a collecting trip with C. J. Maynard up the St. Johns River to Lake Harney and at Dummitt Creek on Indian River; many birds mentioned. This paper parallels in many details the account by C. J. Maynard of his first Florida trip (1868–69); Maynard states (in letter) that Le Baron's account is largely a fabrication, and the records of birds collected are not to be relied on.

1880. [Letter from Titusville, Florida]: Forest and Stream, vol. 13, p. 953, January 1.

Mentions a number of species of ducks, coots, pelicans, etc., in the Banana River.

1897. Northern wildfowl in Florida waters: Forest and Stream, vol. 48, p. 424, May 29.

Records of the Surf Scoter, Red-throated Loon, and Trumpeter Swan (not considered reliable).

LENTE, WILLIAM K.

1877. A visit to a nesting place of the Wood Ibis—*Tantalus loculator:* Forest and Stream, vol. 9, p. 327, November 29.

Description of a rookery on Lake Ashby.

1878. Florida notes: Forest and Stream, vol. 9, pp. 488–489, January 31.

Contains account of a struggle between a Red-shouldered Hawk and a black snake.

LEWIS, HARRISON FLINT

1931. Additional information concerning the Double-crested Cormorant (*Phalacrocorax auritus auritus*): Auk, vol. 48, pp. 207–214, April.

Contains a number of records of this species taken in Florida.

LEWIS, W. F.

1929. Sparrow Hawk captures a Meadowlark: Oologist, vol. 46, p. 24, February.

Observation near St. Petersburg, Fla.

LINCOLN, FREDERICK CHARLES

1922. Trapping ducks for banding purposes: Auk, vol. 39, pp. 322–334, July.

Contains records of ducks banded at Lake Scugog, Ontario, and recovered in Florida.

1924. Returns from banded birds, 1920 to 1923: U. S. Dept. Agr. Bul. 1268, 55 pp., October 16.

Contains several records of banded birds taken in Florida.

1927. Returns from banded birds, 1923 to 1926: U. S. Dept. Agr. Tech. Bul. 32, 96 pp. December.

Contains numerous records of banded birds taken in Florida.

LINCOLN, FREDERICK CHARLES (Continued)

1928. The migration of young North American Herring Gulls: Auk, vol. 44, pp. 49–59, January.
Contains two records of banded birds recovered in Florida.

1930. Migratory status of Mourning Doves is proved by banding: U. S. Dept. Agr. Yearbook for 1930, pp. 386–389.
Mention of Mourning Doves banded in the Northern states and captured in Florida.

LINDEN, NICHOLAS V.

1890. Notes from Island Lake, Florida: Oologist, vol. 7, p. 253.
Nesting records of 8 species.

LIPPINCOTT, JOSEPH WHARTON

1919. An evening with birds in Florida: Bird-Lore, vol. 21, pp. 16 and 17, February.
Random notes on many birds, but without definite data.

LITCH, KATHERINE H.

1928. Notes from Benson Springs: Florida Naturalist, vol. 2, pp. 31–32, October.
Breeding of Brown Thrasher, and records of a number of other species.

LLOYD, C. K.

1927. Nesting of the Florida Red-winged Blackbird: Wilson Bul., vol. 39, p. 170, September.
Observations at Bradenton.

LONG, RICHARD CALL

1894a. Among the swift-winged jacksnipes: Amer. Field, vol. 41, p. 34, January 13.
Account of snipe hunting in Leon County, Fla.

1894b. Among the Bluebills, the gamest of sea ducks: Amer. Field, vol. 41, p. 81, January 27.
Account of Scaup (or Ring-neck) hunting in Leon County.

1894c. The coast hunting grounds of Apalachee Bay: Amer. Field, vol. 41, pp. 1–104, February 3.
Account of duck and goose hunting; mention of Mallards, Dusky Duck, Pintail, Shoveller, Widgeon, and teal.

1894d. Wood-ducks, their haunts and habits: Amer. Field vol. 41, p. 129, February 10.
Description of habits and methods of hunting in northern Florida.

1894e. The open season in middle Florida: Amer. Field, vol. 41, p. 251, March 17.
Account of quail, snipe, and duck hunting in Leon County.

LONGSTREET, RUPERT JOHN (see also Ainsworth and Longstreet, and Vrooman and Longstreet)

1910a. [Fish hawk]: Oologist, vol. 27, p. 93, August.
An Osprey caught in a trap.

1910b. Coronado Florida migrants: Oologist, vol. 27, pp. 119–120, October.
Migration dates of 36 species.

1910c. Comparatively rare species at Coronado, Florida: Oologist, vol. 27, p. 152, December.
Records of 25 species.

1911. Queer positions for Florida Wren and Ground Dove nests: Oologist, vol. 28, pp. 132–133, August.
Observations made in Florida.

1912a. Winter bird life at Mosquito Inlet, Florida: Oologist, vol. 29, pp. 224–225, February.
Brief notes on a number of species.

1912b. [Ground dove]: Oologist, vol. 29, p. 265, April.
Two eggs said to be the invariable complement.

1914a. Birds on the St. Johns River: Oologist, vol. 31, p. 6, January.
Brief notes on about 26 species.

1914b. Bird-Lore's fourteenth Christmas census: Bird-Lore, vol. 16, p. 41, February.
List of 16 species seen at Coronado Beach, December 25, 1913.

1924. The new Brown Pelican rookery on the Florida East Coast: Wilson Bul., vol. 26, pp. 65–68, June.
Account of establishment of rookery in Mosquito Lagoon; also of destruction of many birds by fishermen.

1925a. The Brown Pelicans in Mosquito Lagoon: Sunrise Mag. (Daytona, Fla.), pp. 6, 14, 18, January 31.
Account of the establishment of the Brevard Island rookery in 1924.

1925b. Blue Goose (*Chen caerulescens*) at Seabreeze, Florida: Auk, vol. 25, pp. 264–265, April.
Record of one seen November 13 and 14, 1924.

1925c. Boreal Limicolae summering in Florida: Auk, vol. 42, pp. 581–583, October.
Records of 9 species, mostly from Daytona Beach.

1926a. Additional data on the birds of Volusia County, Florida: Halifax River Bird Club (Daytona Beach), Bul. 4, 8 pp., February.
Migration data on 37 species; notes of occurrence of 46 species.

1926b. Some water bird notes from the Florida East Coast: Auk, vol. 43, pp. 378–379, July.
Records of 14 species, mainly from Daytona Beach.

1926c. Key to the common water birds of Florida: Halifax River Bird Club (Daytona Beach, Fla.), 27 pp.

1927a. Noddy Tern (*Anoüs stolidus*) at Daytona Beach, Florida: Auk, vol. 44, pp. 92–93, January.
Records of Noddy and Sooty Terns and Frigate Birds at Daytona, September 18, 1926.

1927b. Connecticut Warbler at Daytona Beach, Florida: Auk, vol. 44, p. 572, October.
Record of a specimen taken May 18, 1927.

1928a. Flamingo at Shell Point (Wakulla County): Florida Naturalist, vol. 1, p. 36, January.
Record of a Flamingo seen for several weeks in the fall of 1927.

1928b. Brown Thrasher nesting at Bradenton (Manatee County): Florida Naturalist, vol. 1, p. 36, January.
Record of a pair nesting at Bradenton and another pair at Winter Park.

1928c. Bird-Lore's twenty-eighth Christmas census: Bird-Lore, vol. 30, p. 47, February.
Records of 81 species observed at Daytona Beach, Fla., December 24, 1927.

1928d. Check list of the more common Florida birds: Florida Naturalist, vol. 1, pp. 60–64, April.
List of 174 species, with dates of occurrence.

1928e. Migration flight of Goldfinches, Kingbirds, and Nighthawks: Auk, vol. 45, pp. 229–230, April.
Account of large numbers of these three species seen at Daytona Beach.

1928f. Mountain Plover at Daytona Beach, Florida: Auk, vol. 45, p. 208, April.
Record of a specimen taken December 17, 1927.

1929a. Great White Heron and Roseate Spoonbill near Daytona Beach, Florida: Auk, vol. 46, p. 105 January.

1929b. Bird-Lore's twenty-ninth Christmas census: Bird-Lore, vol. 31, p. 42, February.
Records of 76 species observed at Daytona Beach, Fla., December 24, 1928.

1929c. On commonness among birds: Florida Naturalist, vol. 2, pp. 70–72, April.
Contains numerous records of birds seen near Daytona Beach, Fla.

1929d. Florida—Mecca of the bird lover: Nature Magazine, vol. 14, pp. 357–360, 381–382, December.
Popular account of bird life in Florida.

1930a. Further water bird notes from the Florida east coast: Auk, vol. 47, pp. 95–96, January.
Records of occurrence of 12 species near Daytona Beach.

1930b. Notes on speed of flight of certain water birds: Auk, vol. 47, pp. 428–429, July.
Data on 12 species recorded at Daytona Beach, Fla.

1930c. Bird study in Florida: Halifax River Bird Club, Daytona Beach, Fla. 183 pp., 18 pls.
Contains brief descriptions and notes on habits of most species; field key; nominal list of 241 species accredited to the State; annotated list of 203 species recorded from the Daytona Beach region.

1930d. Chimney Swift banding experiences in Florida: Florida Naturalist, vol. 3, pp. 100–104, July.
Notes from Daytona Beach.

LONGSTREET, R. J. AND LOTTA

1924. Bird-Lore's twenty-fourth Christmas census: Bird-Lore, vol. 26, p. 33, February.
List of 63 species seen at Daytona Beach, Fla.

LONGSTREET, R. J. AND LOTTA (Continued)
1925. Bird-Lore's twenty-fifth Christmas census: Bird-Lore, vol. 27, p. 44, February.
List of 73 species seen near Daytona Beach, December 24, 1924.
1926. Bird-Lore's twenty-sixth Christmas census: Bird-Lore, vol. 28, pp. 34–35, February.
Records of 77 species observed at Daytona Beach, December 24, 1925.
1927. Bird-Lore's twenty-seventh Christmas census: Bird-Lore, vol. 29, p. 32, February.
Records of 67 species observed at Daytona Beach, December 23, 1926.
1930. Bird-Lore's thirtieth Christmas census: Bird-Lore, vol. 32, p. 42, February.
Records of 73 species seen at Daytona Beach, December 26, 1929.
LOWE, PERCY ROYCROFT
1908. On the Ground Dove of Porto Rico, with notes on the other species of Chamaepelia: Ibis, vol. 2 (ser. 9), pp. 107–117, January.
Remarks on plumage of specimens of the Ground Dove from Charlotte Harbor, Fla.
LOWERY, GEORGE H., R. MCCLANAHAN, AND F. M. WESTON
1929. Bird-Lore's twenty-ninth Christmas census: Bird-Lore, vol. 31, p. 44, February.
Records of 65 species observed at Pensacola, December 23, 1928.
"M., C. S."
1888. Nesting habits of the Brown Pelican: Oologist, vol. 5, p. 106, July.
Habits in Florida.
"M., W. A."
1882. Swallow-tailed Hawk in Florida: Forest and Stream, vol. 19, p. 127, September 14.
Four birds seen near Tampa.
1886. Swans in Florida: Forest and Stream, vol. 26, p. 147, March 18.
Record of a Whistling Swan seen between Pensacola and St. Andrews Bay.
MABBOTT, DOUGLAS CLIFFORD
1920. Food habits of seven species of American shoal-water ducks: U. S. Dept. Agr. Bul. 862, 67 pp., 7 pls., December.
MACKAY, GEORGE HENRY
1891a. The habits of the Golden Plover (*Charadrius dominicus*) in Massachusetts: Auk, vol. 8, pp. 17–24, January.
1891b. The Scoters in New England: Auk, vol. 8, pp. 279–290, July.
1892. Habits of the Hudsonian Curlew in Massachusetts: Auk, vol. 9, pp. 345–352, October.
1893. Observations on the Knot (*Tringa canutus*): Auk, vol. 10, pp. 25–35, January.
Contains mention of a specimen taken at Big Pass, Fla.
1896. Sundry notes: Auk, vol. 13, p. 182, April.
Note on habits of Eagles at Charlotte Harbor, Fla.
1897. A great flight of Robins in Florida: Auk, vol. 14, p. 325, July.
Thousands seen at Hawk's Park in February, 1897.
MAY, JOHN BICHARD
1928. Edward Howe Forbush: a biographical sketch: Proc. Boston Soc. Nat. Hist., vol. 39, pp. 33–72, pls. 4, 5.
Contains an account of Forbush's trip to Florida in 1877, with mention of numerous birds.
1929. Edward Howe Forbush, friend of the birds: Birds of Massachusetts (E. H. Forbush), Mass. Dept. Agr., vol. 3, pp. xvii–xlviii.
Contains an account of Forbush's trips in Florida.
MAYER, ALFRED GOLDSBOROUGH
1908a. Tortugas, Florida (reservation news): Bird-Lore, vol. 10, p. 187, August.
Report on condition of the birds on the Tortugas reservation.
1908b. Tortugas Reservation (reservation notes): Bird-Lore, vol. 10, p. 229, October.
Colony of Least Terns reported successful.
1910. Department of Marine Biology [Annual report]: Yearbook Carnegie Inst. Washington, 1909 [1910], p. 151.
Brief account of Watson's studies of the Sooty and Noddy Terns on the Tortugas in 1910.

MAYNARD, CHARLES JOHNSON

1872. A catalogue of the birds of Coos County, N. H., and Oxford County, Maine: Proc. Boston Soc. Nat. Hist., vol. 14, pp. 356–385.
Contains frequent notes on occurrence of certain birds in Florida.

1872–78. The Birds of Florida, with the water and game birds of eastern North America. Issued in 9 parts; iv + 232 pp.; 16 pls.

1873a. The strange and rare birds of North America: Amer. Sportsman, vol. 2, p. 155, July; vol. 3, p. 66, November.
Habits of the Anhinga and Man-o'-war-bird in Florida.

1873b. Blue Kite—Everglade Kite: Amer. Sportsman, vol. 3, p. 181, December 20.
Habits of *Rostrhamus sociabilis* in Florida (taken from The Birds of Florida).

1874a. Supposed new species of pelican: Amer. Sportsman, vol. 3, p. 379, March 14.
Description of *Pelecanus albicollis*, type from Cedar Keys, February 20, 1874.

1874b–1875a. A naturalist's trip to Florida: Amer. Sportsman, vol. 4, pp. 2, 22, 66, 114, 162, 226–227; vol. 5, pp. 34–36, 81–82, 193–194, 226, 342–343.
Account of a trip in winter of 1868–69 from Fernandina and Jacksonville up St. Johns River to Lake Harney, overland to Mosquito Lagoon and back via Halifax River and inland waterways to St. Augustine.

1875b. A new species of finch from Florida: Amer. Sportsman, vol. 5, p. 248, January 16.
Original description of *Ammodramus melanoleucus* [=*Ammospiza nigrescens*], with notes on habits.

1876. Variations in the breeding habits of certain birds: Rod and Gun and Amer. Sportsman, vol. 8, pp. 314–315, August 12.
Data on number and size of eggs laid by 22 species of Florida birds, with some notes on habits.

1881. The birds of eastern North America. 4to, iv + 532 pp., 32 pls.
Pages 1–128 were issued as The Birds of Florida (1872–1878). The entire work contains much original matter pertaining to Florida birds.

1883. Cuban Nighthawk (*Chordeiles popetue minor*) in Florida: Quart. Journ. Boston Zool. Soc., vol. 2, p. 44. [Not seen.]

1887. White Pelican: Oologist, vol. 4, pp. 101–102, October–December.
Account of habits in Florida (extracted from Birds of Eastern North America).

1889a. The southern Yellow-winged or Grasshopper Sparrow (*Ammodramus australis*): Orn. and Ool., vol. 14, p. 60, April.
Remarks on Florida specimens.

1889b. [Letter to the editor concerning Burrowing Owls]. Orn. and Ool., vol. 14, p. 128, August.
Suggests that the Owls occupy burrows of the gopher turtle.

1889c–1895. The birds of eastern North America. (Rev. ed.) 721 pp., 40 pls. Last part issued December 24, 1895.
This edition is in part a reprint of the first edition (1881) but contains much additional matter, and the arrangement and pagination are entirely different. Contains original description of *Agelaius phoeniceus floridanus*, type from Key West; and of *Minus* [=*Mimus*] *carolinensis grisifrons*, type from Key West.

1905–1907. Directory to the birds of eastern North America. vi + 326 pp.
Contains many references to Florida birds; original description of *Pinacantor* [*Dendroica*] *vigorsii florida;* types from Enterprise and Deep Creek, Fla.

1927. Ornithological reminiscences of Ipswich Beach [Mass.]: Bul. Essex County Orn. Club, 1926 [May 9, 1927], pp. 13–16.
Contains record of a Long-billed Curlew seen on the Indian River, Fla.

1928a. Vocal organs of talking birds. West Newton, Mass., 380 pp., 3 col. plates.
Contains a few notes on birds seen in Florida, including the Limpkin and Carolina Paroquet.

MAYNARD, CHARLES JOHNSON (Continued)

1928b–1930. Adventures of a naturalist in Florida from 1866 [=1868]–1900. i–vi: Florida Naturalist, vol. 2, pp. 14–19 (October, 1928), 33–39 (January, 1929), 61–67 (April, 1929), 91–98 (July, 1929); vol. 3, pp. 11–16 (October, 1929), 47–53 (January, 1930).
Account of Maynard's trips in Florida.

MCATEE, WALDO LEE

1905. The horned larks and their relation to agriculture: U. S. Dept. Agr. Biol. Survey Bul. 23, 37 pp., 2 pls.

1908. Food habits of the grosbeaks: U. S. Dept. Agr. Biol. Survey Bul. 32, 92 pp., 4 pls.
Contains data on the food habits of the Cardinal in Florida.

1910. Notes on *Chen caerulescens*, *Chen rossi*, and other waterfowl in Louisiana: Auk, vol. 27, pp. 337–339, July.

1911a. Winter ranges of geese on the Gulf coast: notable bird records for the same region: Auk, vol. 28, pp. 272–274, April.
Contains record of a Blue Goose shot on St. Vincent Island.

1911b. Our vanishing shore birds: U. S. Dept. Agr. Biol. Survey Circ. 79, 9 pp., 3 figs., April 8.

1911c. Local names of waterfowl and other birds: Forest and Stream, vol. 77, pp. 172–174, and 196–197, July 29.
Contains frequent mention of birds occurring in Florida.

1911d. Woodpeckers in relation to trees and wood products: U. S. Dept. Agr. Biol. Survey Bul. 39, 99 pp., 12 pls., September 26.

1918. Food habits of the Mallard Ducks of the United States: U. S. Dept. Agr. Bul. 720, 35 pp., December 23.
Contains report on food of the Florida Duck.

1922. Notes on food habits of the Shoveller or Spoonbill Duck (*Spatula clypeata*): Auk, vol. 39, pp. 380–386, July.

1923. Local names of migratory game birds; U. S. Dept. Agr. Misc. Circ. 13, 75 pp., 52 figs., October.
Contains many vernacular names of birds, as used in Florida.

MCATEE, W. L. AND F. E. L. BEAL

1924. Some common game, aquatic, and rapacious birds in relation to man: U. S. Dept. Agr. Farmers' Bul. 497 (revised edition), 28 pp., March. (First issued in 1912).

MCCLANAHAN, ROBERT CHARLES

1930. Least Bitterns: Florida Naturalist, vol. 3, p. 107, July.
Breeding in salt marsh near Pensacola.

MCCLANAHAN, R. C., FRANK A. SWINDELL, AND FRANCIS M. WESTON

1930. Bird-Lore's thirtieth Christmas census: Bird-Lore, vol. 32, pp. 43–44, February.
Records of 74 species seen near Pensacola, December 26, 1929.

MCCLINTOCK, NORMAN

1910. The taming of a Great White Heron: Bird-Lore, vol. 12, p. 1, illus., February.
Account of a bird tamed by fishermen on the Florida keys.

MCCORMICK, W. F. J.

1915. The Carolina Paroquet in Florida: Bird-Lore, vol. 17, p. 453, December.
Account of a flock of about a dozen birds seen in March and April, 1915 [locality purposely suppressed, but probably in extreme southern Florida].

MCCRARY, JOHN M. (see also Koch and McCrary)

1891. The Carolina Paroquet in Florida: Forest and Stream, vol. 37, p. 183, September 24.
Report of several small flocks seen in Hernando County in the spring of 1891; tells of 200 having been killed in an orange grove in 1889.

MCKINNON, ANGUS

1908a. A pair of Blue-gray Gnatcatchers that moved their nest: Bird-Lore, vol. 10, p. 173, August.
Observations at De Funiak Springs, Fla.

1908b. The wit of a Florida Nighthawk: Bird-Lore, vol. 10, pp. 261–262, December.
Account of a Nighthawk at De Funiak Springs moving its eggs.

1909. Tin cans as homes for Bluebirds: Bird-Lore, vol. 11, p. 86, April.
Nesting habits at De Funiak Springs.

McPherson, Charles S.

1887. A voice from Florida: Hoosier Nat., vol. 2, pp. 165–166, July. [Not seen.]

1888. Birds of western Florida. The Laughing Gull: Hoosier Nat., vol. 3, p. 20. [Not seen.]

1889. Notes on the eggs and birds of Hillsborough County, Florida: Oologist, vol. 6, pp. 147–149, August.
Records of eggs collected in spring of 1888; mention of Cormorants and Pelicans breeding in what was probably the Maximo Rookery.

Mearns, Edgar Alexander

1892. A study of the Sparrow Hawks (subgenus *Tinnunculus*) of America, with especial reference to the continental species (*Falco sparverius* Linn.): Auk, vol. 9, pp. 252–270, July.
Contains records of several Florida specimens.

1902a. Descriptions of three new birds from the southern United States: Proc. U. S. Nat. Mus., vol. 24, pp. 915–926, June 2.
Contains original description of *Coturniculus* [*Ammodramus*] *savannarum floridanus*, type locality, Kissimmee Prairie; and of *Progne subis floridana*, type locality, Lake Kissimmee.

1902b. Two subspecies which should be added to the Check-List of North American birds: Auk, vol. 19, pp. 70–72, January.
Contains description of characters and of nest and eggs of *Tyrannus tyrannus vexator*.

1902c. Capture of the Mexican Jacana in Florida: Auk, vol. 19, p. 79, January.
Record of a specimen taken on Lake Okeechobee in 1899.

1911a. Description of a new subspecies of the Painted Bunting from the interior of Texas: Proc. Biol. Soc. Washington, vol. 24, pp. 217–218, October 31.
Contains measurements of a specimen of *Passerina ciris ciris* from Matanzas Inlet.

1911b. On the correct name for the Red-winged Blackbird of the northeastern United States: Proc. Biol. Soc. Washington, vol. 24, pp. 226–227, October 31.
Agelaius phoeniceus phoeniceus said to be the correct name of the Florida Red-wing and *Agelaius phoeniceus predatorius* of the Northeastern Red-wing.

Mercer, Miller T.

1914. Florida notes: Oologist, vol. 31, pp. 46–48, March 15.
Observations on birds near Miami.

1916. Cocoanut Grove: Oologist, vol. 33, p. 79, April 15.
Brief list of birds seen at Coconut Grove.

Merriam, Clinton Hart

1874. Ornithological notes from the South. II. Florida: Amer. Nat., vol. 8, pp. 85–89, February.
Annotated list of 71 species observed on a boat trip on the St. Johns and Oklawaha Rivers in April, 1873.

1885a. Bird migration at Sombrero Key, Florida: Auk, vol. 2, pp. 60–63, January.
Contains many records of birds striking the light.

1885b. Swainson's Warbler off southern Florida: Auk, vol. 2, p. 104, January.
Records of numerous individuals striking the light on Sombrero Key.

1887. Another specimen of Bachman's Warbler (*Helminthophila bachmani*): Auk, vol. 4, p. 262, July.
Record of a bird that struck the light on Sombrero Key—the first Florida record.

1888. *Euetheia canora* from Sombrero Key, Florida—a bird new to the United States: Auk, vol. 5, p. 322, July.
Record of a Melodious Grassquit striking the light on Sombrero Key—the only United States record.

1889. A hawk bearing a legend: Auk, vol. 6, p. 276, July.
Record of a Duck Hawk found at Cape Canaveral.

1890. General results of a biological survey of the San Francisco Mountain region in Arizona, with special reference to the distribution of species: North Amer. Fauna, no. 3, pp. 5–34, August.
Recognition of a "Tropical Province" in southern Florida.

MERRIAM, CLINTON HART (Continued)
1892. The geographic distribution of life in North America, with special reference to the Mammalia: Proc. Biol. Soc. Washington, vol. 7, pp. 1–64, April 13.
Contains (pp. 51–52) remarks on faunal distribution of birds in Florida.
1894. Laws of temperature control of the geographic distribution of terrestrial animals and plants: Nat. Geog. Mag., vol. 6, pp. 229–238, pls. 12–14, December 29.
Contains map of the life zones of the United States.

MERRILL, JAMES CUSHING
1879. Maynard's birds of Florida [review]: Bul. Nuttall Orn. Club, vol. 4, pp. 114–115, April.

MEYER, FRIEDRICH ALBRECHT ANTON
1794. Uebersicht der neuen zoologischen Entdeckungen im Jahr 1793, oder kurz vordessen Anfange: Zool. Annalen, pp. 133–311.
Contains (pp. 283–298) descriptions of 5 species of birds based on Bartram's "Travels"; *Coragyps atratus*, *Grus pratensis*, and *Aramus pictus* date from this paper.

MILLAIS, JOHN GUILLE
1902. The natural history of the British surface-feeding ducks. 4to, 102 pp., 41 pls.

MILLS, HERBERT RAPHAEL (see also Baynard, Blackman, and Mills)
1911. Bird-Lore's eleventh bird census: Bird-Lore, vol. 13, p. 34, February.
List of 26 species seen at Jacksonville, December 25, 1910.
1916. The Egret situation in south Florida: Bird-Lore, vol. 18, pp. 62–65, 2 photos, February.
Account of a trip from Tampa to Key West, examining bird rookeries along the coast.
1922. Bird-Lore's twenty-second Christmas census: Bird-Lore, vol. 24, p. 28, February.
Records of 33 species seen at Tampa, December 25, 1921.
1931. The Florida Brown Pelican; Florida Naturalist, vol. 4, pp. 31–36, 4 photos, January.
Account of a visit to the Brevard Reservation, October 5, 1930.

MILLS; MRS. HERBERT RAPHAEL
1916. Bird-Lore's sixteenth Christmas census: Bird-Lore, vol. 18, p. 32, February.
Records of 26 species observed at Tampa, December 26, 1915.

MILLS, MRS. MARY GRANGER
1911. Bird-Lore's eleventh bird census: Bird-Lore, vol. 13, p. 34, February.
Records of 25 species observed at Jacksonville, December 26, 1910.
1912. Bird-Lore's twelfth Christmas bird census: Bird-Lore, vol. 14, pp. 32–33, February.
Records of 27 species seen at Jacksonville, December 24, 1911.

MITCHELL, CATHERINE ADAMS
1931. Roseate Spoonbills in Florida: Auk, vol. 48, p. 259, April.
Record of 200 seen near Marco, February 20, 1931.

MITCHELL, I. U. [= probably N.] AND F. R. OSBORNE
1913. Bird-Lore's thirteenth bird census: Bird-Lore, vol. 15, pp. 33–34, February.
List of 22 species seen at De Land, December 26, 1912.

MITCHELL, R. M.
1883. Large set: Orn. and Ool., vol. 8, p. 64, August.
Record of a set of 7 Mockingbird's eggs found at Sanford.

MONROE, MRS. KIRK
1919. Coconut Grove (Fla.) Audubon Society: Bird-Lore, vol. 21, p. 434, December.
Records of Bridled Tern and Roseate Spoonbill at Coconut Grove.

MOORE, M. HARRY
1908. A Little Blue Heron rookery: Bird-Lore, vol. 10, pp. 163–165, August.
Description of a rookery near De Funiak Springs.

MORRIS, ROBERT TUTTLE
1928. A vacationer in Florida: Oologist, vol, 45, pp. 43–44, April.
Random notes on birds seen along the Tamiami Trail.

MORRISON, DAISIE M. (see Willson and Morrison)

MORRISON, L. S.
1888. Ground Dove. Oologist, vol. 5, p. 7, January.
Record of a set of fresh eggs found near Lake Helen, October 12, 1887.

MORTIMER, D. [= BENJAMIN]
1890. Notes on habits of a few birds of Orange County, Florida: Auk, vol. 7, pp. 337–343, October.
Notes on 12 species observed mainly at Sanford.

MOUNTS, BERYL T.
1923. Loggerhead Shrike eats English Sparrow: Wilson Bul. vol. 35, p. 221, December.
Habits as observed at Zephyrhills.
1927a. The Purple Gallinule carries its young: Wilson Bul., vol. 39, pp. 37–38, March.
Observation made at Plant City.
1927b. Some observations made in Florida and en route to Iowa: Wilson Bul. vol. 39, p. 235, December.
Brief mention of a few birds seen in Florida.

MOUNTS, BERYL T., LEWIS H., AND EUGENE, AND O. E. BAYNARD
1921. Bird-Lore's twenty-first Christmas census: Bird-Lore, vol. 23, p. 20, February.
Records of 58 species seen at Plant City, December 25, 1920.

MOUNTS, EUGENE
1923. Bird-Lore's twenty-third Christmas census: Bird-Lore, vol. 25, p. 29, February.
List of 47 species observed near Zephyrhills, December 25, 1922.

MOUNTS, LEWIS H., AND EUGENE
1922. Bird-Lore's twenty-second Christmas census: Bird-Lore, vol. 24, p. 28, February.
Records of 50 species seen at Plant City, December 25, 1921.

MUIR, JOHN
1916. A thousand-mile walk to the Gulf. xxvii + 212 pp.
Contains two chapters describing experiences in Florida, with brief mention of birds seen.

MULDOON, G. H.
1877. A collecting tour in Florida: Oologist (Willard's), vol. 3, pp. 35–36, July.
Account of birds seen on a trip up the Caloosahatchee River to Lake Okeechobee.

NAUMAN, CHARLES H.
1867. Breeding place of the pelican: Amer. Nat., vol. 1, pp. 436, 438, October.
States that the White Pelican breeds abundantly in Indian River.
1870a. Oological: Amer. Nat., vol. 4, p. 442, September.
Record of nesting of the Cardinal near New Smyrna.
1870b. An albino Turkey Buzzard (*Cathartes aura* Illig): Amer. Nat., vol. 4, p. 376, August.
An albino Turkey Buzzard and a white Black Duck (*Anas obscura*) recorded at Smyrna, Fla.

NEHRLING, HENRY
1893–1896. Our native birds of song and beauty. Vol. 1 (1893), l + 371 pp., plates 1–18; vol. 2 (1896), 452 pp., plates 19–36.
Contains many references to Florida birds.
1904a. Bird life in my Florida garden: Warbler, vol. 2, pp. 20–23, April.
Treats of various birds seen in his garden at Gotha.
1904b. The beginning of spring in Florida: Plant World, vol. 7, pp. 93–96 (April), 118–122 (May), 137–140 (June).
Contains notes on plants, birds, mammals, and reptiles.
1905. Die vogelwelt meines gartens: Monatsschrift Deutsch. Verein Schutze Vogelwelt, vol. 30, pp. 43–60, January.
Contains many notes on birds observed in Florida.
1906. Bird-life in my Florida garden during the months of September and October: Warbler (ser. 2), vol. 2, pp. 11–19.
Notes on habits and food of many species observed at Gotha.

NEHRLING, HENRY (Continued)

1907. Die Gesangskönigin der nordamerikanischen Vogelwelt: Monatsschrift Deutsch. Verein Schutze Vogelwelt, vol. 32, pp. 56–69, January.
Popular account of American song birds, with frequent references to birds seen in Florida.

NELSON, EDWARD WILLIAM

1887. Report upon natural history collections made in Alaska between the years 1877 and 1881. 226 pp., 12 plates.

1904. A revision of the North American mainland species of *Myiarchus:* Proc. Biol. Soc. Washington, vol. 17, pp. 21–50, March 10.
Contains remarks on the characters of the Southern Crested Flycatcher.

1923. Community protection of migratory wild fowl in Florida: Amer. Forestry, vol. 29, pp. 523–526, 7 photos, September.
Account of feeding Lesser Scaup Ducks, Ring-billed, Herring, Bonaparte, and Laughing Gulls at Daytona.

NELSON, GEORGE

1911. Notes on Pelican Island: Auk, vol. 28, pp. 393–397, pls. 4–7, October.
Habits of the Brown Pelican.

NICHOLS, JOHN TREADWELL (see also Griscom and Nichols)

1913. Notes on offshore birds: Auk, vol. 30, pp. 506–512, October.
Contains record of Audubon's Shearwaters seen near the coast of Florida.

1918. Bird-notes from Florida: Abstr. Proc. Linn. Soc. New York, no. 30, pp. 20–27, September 18.
Notes on about 30 species observed among the Florida Keys.

1920. [Remarks on birds seen in Florida]: Abstr. Proc. Linn. Soc. New York, no. 32, pp. 9–10.
Notes on 7 species.

1921. *Coereba bahamensis* at Miami, Florida: Auk, vol. 38, pp. 461–462, July.
Record of a Bahama Honey Creeper seen February 7, 1921.

NICHOLSON, AUGUSTUS MILTON

1896. Freak eggs of the Wood Ibis: Osprey, vol. 1, p. 27, October [correction on p. 39, November].
Taken in Florida.

1897a. Death of a Fish Hawk: Osprey, vol. 2, p. 55, December.
A bird lost in the surf at Coronado Beach.

1897b. Albino Turkey Vulture; Osprey, vol. 1, p. 67, December.
A bird seen at Orlando, Fla.

1899a. The Florida Burrowing Owl: Osprey, vol. 3, p. 61, December.
Nesting habits.

1899b. My rookery: Osprey, vol. 3, p. 73, January.
Wood Ibis, Anhinga, and Florida Cormorant captured alive.

NICHOLSON, DONALD JOHN

1911. [Egg notes]: Oologist, vol. 28, p. 63, March.
Records of eggs of Bald Eagle and Horned Owl taken at Orlando, Fla.

1911a. Florida notes: Oologist, vol. 28, p. 92, May 15.
Nesting of "white herons" and Wood Ibis.

1911b. Correction: The Oologist, vol. 28, p. 118, July 15.
"White heron" should be Ward's Heron.

1911c. Florida Screech Owl (*Otus asio mccalli*): Oologist, vol. 28, p. 119, July 15.
Nesting habits of the Screech Owl, Red-headed Woodpecker, and Mourning Dove.

1912. An Orange County Wood Ibis rookery: Oologist, vol. 29, pp. 377–380, November.
Nesting habits of Wood Ibis, Florida Cormorant, and Anhinga near Orlando.

1925a. Florida notes: Oologist, vol. 42, pp. 89–90, June.
Record of a King Rail taken at Orlando, February 16, 1925, with an egg ready to lay.

1925b. Some Florida notes: Oologist, vol. 42, p. 106, July.
Notes on nesting of 6 species.

1926a. Nesting habits of the Everglade Kite in Florida: Auk, vol. 43, pp. 62–67, pl. 4, January.
Nesting colony in the St. Johns River marshes described.

1926b. Horned Owl shrewdness and ferocity: Oologist, vol. 43, p. 14, February.
Collector attacked by the Owls while he was ascending to the nest.

1926c. My first Ivory-billed Woodpeckers: Oologist, vol. 43, pp. 156–158, December.
Record of a pair seen in Osceola County, February 17, 1924.

1927a. Late nesting of Wayne's Clapper Rail: Auk, vol. 44, p. 98, January.
Records of eggs found at New Smyrna, July 18 and 31, 1926; also notes on the Gray Kingbird and Yellow-billed Cuckoo.

1927b. Florida notes: Auk, vol. 44, p. 115, January.
Records of the Sooty Tern at Merritt Island and of Man-o'-war-birds and Brown Pelicans in Orange County.

1927c. Sandhill Cranes of the last frontier: Oologist, vol. 44, pp. 30–36, pl. 1, March.
Habits as observed in Florida.

1927d. Series of Florida Blue Jay, 32 sets in collection of Donald J. Nicholson, Orlando, Florida: Oologist, vol. 44, p. 37, March.
Photograph of eggs from Florida.

1927e. January bird nesting in Florida: Oologist, vol. 44, pp. 70–71, June.
Breeding habits of various species on the Kissimmee Prairie.

1927f. Photographing Wayne's Clapper Rail: Auk, vol. 44, pp. 368–370, pls. 20, 21, July.
Description of nesting site and habits of birds at New Smyrna.

1928a. The Audubon Caracara of Florida: Oologist, vol. 45, pp. 2–8, January.
Nesting, feeding habits, and distribution in Florida.

1928b. Habits of the Black Vulture in Florida: Oologist, vol. 45, pp. 21–24, February.
Breeding habits, flight, feeding, etc.

1928c. Ground nesting of the White Ibis: Wilson Bul., vol. 40, pp. 116–117, June.
Description of nesting habits in Florida.

1928d. Habits of the Limpkin in Florida: Auk, vol. 45, pp. 305–309, pl. 11, July.
Original observations on nesting habits, with photographs of the bird and its nest.

1928e. Actions of a young Wilson's Plover: Wilson Bul., vol. 40, p. 200, September.
Notes on Wilson's Plover and Least Tern at Titusville.

1928f. Gray Kingbirds nesting in Florida: Oologist, vol. 45, pp. 122–123, September.
Description of nests found chiefly near New Smyrna.

1928g. A Swallow-tailed Kite nest in Monroe County: Florida Naturalist, vol. 2, pp. 20–21, October.
Description of a nest with young found May 2, 1928.

1928h. Actions of baby Florida Wild Turkeys: Florida Naturalist, vol. 2, p. 32, October.
Observations made in Collier County.

1928i. The Swallow-tail Kites of southwest Florida: Oologist, vol. 45, pp. 146–151 (November), 158–160 (December), 2 plates; 2 photographs accompanying appeared in the September (p. 127) and October (p. 139) issues.
Original field studies made in spring of 1928 near Everglade.

1928j. Nesting habits of the Seaside Sparrows in Florida: Wilson Bul., vol. 40, pp. 225–237, 5 figs., December.
Original field studies of the Smyrna Seaside, the Dusky Seaside, and the Cape Sable Seaside Sparrows.

1929a. Nesting of the Yellow-throated Warbler in Volusia County, Florida: Wilson Bul., vol. 41, pp. 45–46, March.
Three nests found near Maytown.

1929b. The Audubon Caracara—a little known bird in Florida: Florida Naturalist, vol. 2, pp. 67–69, April.
Range and habits described.

1929c. The peculiar suspiciousness of nesting Southern Meadowlarks: Wilson Bul., vol. 41, p. 104, June.
Observations in Florida (locality not stated).

NICHOLSON, DONALD JOHN (Continued)

1929d. The Glossy Ibis as a rare Florida breeding bird: Florida Naturalist, vol. 2, pp. 85–87, July.
Nesting habits and account of a colony found near Blue Cypress Lake.

1929e. Egg-eating habits of the Florida Gallinule: Auk, vol. 46, pp. 380–381, July.
Account of a Florida Gallinule taking an egg from the nest of a Purple Gallinule in Lake Apopka.

1929f. Notes on the Roseate Spoonbill (*Ajaia ajaja*) in Florida: Auk, vol. 46, pp. 381–382, July.
Numerous recent records of occurrence and nesting.

1929g. Feeding habits of the Florida Grackle: Auk, vol. 46, pp. 389–390, July.
Description of method of eating acorns.

1929h. Breeding of the Dusky Seaside Sparrow on the mainland of Florida: Auk, vol. 46, p. 391, July.
Record of a nest found near the St. Johns River, in Brevard County.

1929i. Black Snakes as bird killers: Wilson Bul., vol. 41, p. 190, September.
Account of a fledgling Florida Blue Jay attacked by a black snake in Florida.

1929j. The breeding range of the Black-necked Stilt: Wilson Bul., vol. 41, pp. 248–249, December.
Mentions all the localities in Florida where the species is known to breed.

1930a. Interesting facts about American Egrets: Florida Naturalist, vol. 3, pp. 54–57, January.
Description of a nesting colony in Volusia County.

1930b. Habits of the Florida Red-shouldered Hawk: Wilson Bul., vol. 42, pp. 32–35, March.
Original observations in various parts of Florida.

1930c. Notes from Florida: Auk, vol. 47, p. 267, April.
Records of breeding of Audubon's Caracara, Florida Crane, and Limpkin.

1930d. Some random notes from Florida: Wilson Bul., vol. 42, pp. 218–219, September.
Observations on Merritt Island and the Kissimmee Prairie.

1931. Scissor-tailed Flycatcher, a rare Florida winter resident: Auk, vol. 48, pp. 428–429, July.
Record of 4 birds seen at Key West in November, 1930.

NICHOLSON, WRAY HAMILTON

1927a. Late Red-headed Woodpecker: Oologist, vol. 44, p. 13, January.
Record of young in nest, September 22, at Orlando.

1927b. King Rail: Oologist, vol. 44, p. 51, January.
Record of a bird with an egg ready to lay found in February at Orlando.

1927c. Notes on the Florida Blue Jay: Oologist, vol. 44, p. 56, April.
Nesting habits near Orlando.

1927d. Nesting of Florida birds in 1927: Oologist, vol. 44, p. 108, August.
Nesting dates of 38 species.

1927e. Chuck-will's-widow: Oologist, vol. 44, p. 108, August.
Seven nests found near Orlando.

1927f. Twice used nests: Oologist, vol. 44, p. 134, October.
Notes on nesting of 10 species near Orlando.

1927g. Notes on Brown Thrasher: Oologist, vol. 44, p. 150, November.
Nesting habits at Orlando.

1927h. Nests found destroyed: Oologist, vol. 44, p. 150, November.
Notes on 8 species in central Florida.

1927i. Nests used two times: Oologist, vol. 44, p. 151, November.
Notes on 12 species at Orlando.

1927j. Florida Screech Owl: Oologist, vol. 44, p. 159, December.
Notes on nesting habits at Orlando.

1927k. Black Vulture: Oologist, vol. 44, pp. 163–164, December.
Nesting habits in Florida.

1928a. A Florida collecting trip: Oologist, vol. 45, pp. 19–20, February.
Notes on nests found on the Kissimmee Prairie.

1928b. Black Vulture in Florida: Oologist, vol. 45, p. 35, March.
Nesting habits.

1928c. Southern Downy Woodpecker: Oologist, vol. 45, pp. 35–36, March.
Nesting habits in Florida.
1929a. Collecting Purple Gallinules in Florida: Oologist, vol. 46, pp. 8–9, January.
Account of nesting habits of Purple Gallinule, Least Bittern, Water-Turkey, and Boat-tailed Grackle near Orlando.
1929b. Birds found breeding in central Florida: Oologist, vol. 46, pp. 12–13, January.
Egg data of 65 species.
1929c. Florida Screech Owl: Oologist, vol. 46, p. 28, February.
Data on 6 nests found near Orlando.
1929d. Notes from Florida: Oologist, vol. 46, pp. 56–57, April.
On 7 species, including a Vermilion Flycatcher[?] and a pair of Ivory-billed Woodpeckers.

NICOLL, MICHAEL JOHN
1904. On a collection of birds made during a cruise of the "Valhalla," R. Y. S., in the West Indies (1903–1904): Ibis (Ser. 8), vol. 4, pp. 555–591, October.
Contains records of 12 species collected at Charlotte Harbor.

NIELAND, L. T.
1928a. Brown Thrasher: Florida Naturalist, vol. 1, p. 87, July.
Record of nesting at Bunnell.
1928b. Killdeer and Cranes near Bunnell: Florida Naturalist, vol. 2, p. 30, October.
Records of young Killdeer, Florida Crane, and Kingfisher.
1930. Starling in Flagler County: Florida Naturalist, vol. 3, p. 59, January.
10 birds seen on a farm 10 miles west of Bunnell, November 14, 1929.

NOBLE, GLADWYN KINGSLEY (see Bangs and Noble)

NORRIS, JOSEPH PARKER
1888. [Eggs of the Bald Eagle]: Orn. and Ool., vol. 13, p. 78, May.
Record of eggs taken at Tampa and Merritt Island.
1890a. Eggs of the Everglade Kite: Orn. and Ool., vol. 15, p. 183, December.
Description of a nest and eggs taken at Bonnet Lake, Lee County.
1890b. Handsome eggs of the Sparrow Hawk: Orn. and Ool., vol. 15, pp. 184–185, December.
Description of a set of eggs taken at Archer.

"NOX, OWEN" (see Cory, C. B.)

NUTTALL, THOMAS
1832–1834. Manual of the ornithology of the United States and Canada. The land birds, 1832; the water birds, 1834.
Contains many references to birds observed in western Florida.

OATES, EUGENE WILLIAM
1901–1902. Catalogue birds' eggs British Museum. Vols. 1 and 2, London, pp. 1–379; 1–400.
Contains records of eggs taken in Florida.

OATES, E. W., AND SAVILE GRAY REID
1903–1905. Catalogue birds' eggs British Museum. Vols. 3 and 4, London, pp. 1–323; 1–352.
Contains records of eggs taken in Florida.

OBER, FREDERICK ALBION ("FRED BEVERLY")
1874a. The Okeechobee Expedition: Forest and Stream, vol. 2, pp. 49–50, 105, 145–146, 153, 193–194, March 5–May 7.
Account of a trip by boat from Fort Bassenger down the Kissimmee and around the lake; description of the country, with brief mention of birds seen.
1874b. Birds of Lake Okeechobee: Forest and Stream, vol. 2, pp. 162–163, April 23.
List of 62 species, with brief annotations, but few dates.

OBERHOLSER, HARRY CHURCH
1896. Descriptions of two new subspecies of the Downy Woodpecker, *Dryobates pubescens* (Linnaeus): Proc. U. S. Nat. Mus., vol. 18, pp. 547–550, June 24.
Southern Downy Woodpecker referred to *Dryobates pubescens meridionalis* (Swainson); description of a specimen from Lake Arbuckle.

OBERHOLSER, HARRY CHURCH (Continued)

1898. A revision of the wrens of the genus *Thryomanes* Sclater: Proc. U. S. Nat. Mus., vol. 21, pp. 421–450, November 19.

Contains remarks on two specimens of Bewick's Wren from Waukeenah.

1904. A revision of the American Great Horned Owls: Proc. U. S. Nat. Mus., vol. 27, pp. 177–192, January 22.

Contains records of *Asio magellanicus virginianus* [= *Bubo virginianus*] from Florida.

1905. The forms of *Vermivora celata* (Say): Auk, vol. 22, pp. 242–247, July.

Contains records of the Orange-crowned Warbler from Florida.

1906. The North American eagles and their economic relations: U. S. Dept. Agr. Biol. Survey Bul. 27, 31 pp., 2 pls.

Contains notes on the food of the Bald Eagle in Florida.

1911. A revision of the forms of the Hairy Woodpecker (*Dryobates villosus* [Linnaeus]): Proc. U. S. Nat. Mus., vol. 40, pp. 595–621, pl. 70, June 3.

Many Florida specimens listed under the name *D. villosus audubonii*.

1912a. A revision of the forms of the Great Blue Heron (*Ardea herodias* Linnaeus): Proc. U. S. Nat. Mus., vol. 43, pp. 531–559, December 12.

Specimens of *Ardea herodias herodias* listed from Gainesville, Oak Lodge, and Lake Harney; many specimens of *Ardea herodias wardi* from Florida listed (with measurements).

1912b. A revision of the subspecies of the Green Heron (*Butorides virescens* [Linnaeus]): Proc. U. S. Nat. Mus., vol. 42, pp. 529–577, August 29.

Records and measurements of many specimens from Florida.

1914. A monograph of the genus *Chordeiles* Swainson, type of a new family of goatsuckers: U. S. Nat. Mus. Bul. 86, vii + 123 pp., 6 pls., April 6.

Contains many Florida records of the Eastern Nighthawk and the Florida Nighthawk.

1917a. Critical notes on the eastern subspecies of *Sitta carolinensis* Latham: Auk, vol. 34, pp. 181–187, April.

Contains records of the White-breasted Nuthatch from Florida; shows that *carolinensis* is the correct name for the Florida race.

1917b. Notes on North American birds. I: Auk, vol. 34, pp. 191–197, April.

Myiarchus crinitus residuus Howe considered to be the correct name of the Florida race of the Crested Flycatcher.

1917c. The migration of North American birds. (2d ser.) I. Five swallows: Bird-Lore, vol. 19, pp. 320–330, December.

Contains migration records from Florida of the Cliff Swallow, Tree Swallow, Bank Swallow, and Rough-winged Swallow.

1918a. The migration of North American birds. (2d ser.) II. The Scarlet and Louisiana Tanagers: Bird-Lore, vol. 20, pp. 16–19, February.

Contains records of the Scarlet Tanager from Miami, Mosquito Inlet, and the Tortugas.

1918b. Migration of North American birds. (2d ser.) III. The Summer and Hepatic Tanagers, Martins, and Barn Swallows: Bird-Lore, vol. 20, pp. 145–152, April.

Contains records of the Summer Tanager and Purple Martin from Florida.

1918c. The migration of North American birds. (2d ser.) IV. The Waxwings and Phainopepla: Bird-Lore, vol. 20, pp. 219–222, June.

Contains records of the Cedar Waxwing from Florida.

1918d. Notes on the subspecies of *Numenius americanus* Bechstein: Auk, vol. 35, pp. 188–195, April.

Records of *Numenius a. americanus* and *N. a. occidentalis* from Florida.

1918e. *Picoides arcticus* in Florida: Auk, vol. 35, p. 479, October.

Record of a specimen of the Arctic Three-toed Woodpecker alleged to have been taken near Mayport in 1875.

1919. Notes on the races of *Quiscalus quiscalus* [= *quiscula*] (Linnaeus): Auk, vol. 36, pp. 549–555, October.

Quiscalus q. quiscula shown to be the proper name for the Florida Grackle, in place of *Q. q. aglaeus* Baird.

1920a. The migration of North American birds. (2d ser.) XII. Arizona Jay, California Jay, and their allies: Bird-Lore, vol. 22, pp. 90–91, April.

Range of the Florida Jay given as from Jacksonville to Miami and Fort Myers.

1920b. Description of a new Clapper Rail from Florida: Proc. Biol. Soc. Washington, vol. 33, pp 33–34, July 24.

Original description of *Rallus longirostris helius;* type from Florida Keys (antedated by *Rallus l. insularum* Brooks).

1920c. The migration of North American birds. (2d ser.) XIII. European Starling and the Bobolink: Bird-Lore, vol. 22, pp. 213–216, August.

Migration records of the Bobolink at Palma Sola, Fla.

1921. The geographic races of *Cyanocitta cristata:* Auk, vol. 38, pp. 83–89, January.

Cyanocitta cristata cristata shown to be the proper name for the Southern Blue Jay; many Florida specimens listed.

1923. The migration of North American birds. (2d ser.) XXI. Orchard Oriole: Bird-Lore, vol. 25, pp. 119–120, April.

Migration records from Pensacola and Tallahassee.

1924. The migration of North American birds. (2d ser.) XXIV. Ruby-throated, Black-chinned, and Calliope Hummingbirds: Bird-Lore, vol. 26, pp. 108–111, April.

Records of the Ruby-throated Hummingbird from Melrose, Chipley, and Tallahassee.

1926a. The migration of North American birds. (2d ser.) XXIX. The Swifts: Bird-Lore, vol. 28, pp. 9–13, February.

Contains records of the Chimney Swift from Orlando and Pensacola.

1926b. The migration of North American birds. (2d ser.) XXX. Chuck-will's-widow and Whip-poor-will: Bird-Lore, vol. 28, pp. 117–120, April.

Contains migration records of the Chuck-will's-widow from Florida.

1926c. The migration of North American birds. (2d ser.) XXXI. The nighthawks: Bird-Lore, vol. 28, pp. 255–261, August.

Contains migration records of the Nighthawk from Palma Sola, Orlando, and Pensacola.

1928. The migration of North American birds. (2d ser.) XXXVII. Yellow-bellied and Red-breasted sapsuckers: Bird-Lore, vol. 30, pp. 253–257, August.

Contains records of *Sphyrapicus varius* from Orlando, Pensacola, and St. Marks.

1930. [Note on the occurrence of a Western Mourning Dove in Florida]: Cleveland Mus. of Nat. Hist. Bul. 40, p. 14, June.

Record of *Zenaidura carolinensis marginella* taken at Wildwood.

1931. The Atlantic Coast races of *Thryospiza maritima* (Wilson): Proc. Biol. Soc. Washington, vol. 44, pp. 123–128, October 17, 1931.

Contains original description of *Thryospiza maritima pelonota,* type from New Smyrna, Fla.

OGILVIE-GRANT, WILLIAM ROBERT

1912. Catalogue of the collection of birds' eggs in the British Museum (Natural History). Vol. 5, xxiii + 547 pp., 22 pls.

Contains Florida records of eggs of the White-eyed Towhee, Florida Grackle, Boat-tailed Grackle, Florida Crow, and Florida Blue Jay.

OHLINGER, DONALD B.

1900. A tame Shrike: Oologist, vol. 17, p. 60, April.

Feeding a Shrike from the hand at Winter Haven.

OHLINGER, MRS. M. A.

1899. The Butcher Bird in Florida: Osprey, vol. 4, pp. 18–19, October.

Habits of the Loggerhead Shrike at Winter Haven.

ORD, GEORGE

1818a. An account of the Florida Jay, of Bartram: Journ. Acad. Nat. Sci. Philadelphia, vol. 1, pp. 345–347, August.
Description of characters and habits.

1818b. Observations on two species of the genus *Gracula* of Latham: Journ. Acad. Nat. Sci. Philadelphia, vol. 1, pt. 2, pp. 253–260 (Read May 19).
Habits of the Boat-tailed Grackle as observed near the mouth of the St. Johns River.

OSBORNE, F. R. (see Mitchell and Osborne)

PACKARD, ALPHEUS SPRING

1891. Occurrence of the Groove-billed Ani at Jupiter Inlet, Florida: Auk, vol. 8, p. 313, July.
Record of a specimen shot in January, 1891.

PACKARD, WINTHROP

1910. Florida Trails. 300 pp., illustrated.
Popular essays on experiences in Florida, with mention of many birds.

PALMER, THEODORE SHERMAN

1912. National reservations for the protection of wild life: U. S. Dept. Agr. Biol. Survey Circ. 87, 32 pp., October 5.
Contains data concerning the bird reservations in Florida.

1913. Bird-Lore's thirteenth bird census: Bird-Lore, vol. 15, p. 34, February.
Records of 21 species observed at Punta Rassa, December 25, 1912.

1931. Audubon's Shearwater in the United States: Auk, vol. 48, pp. 198–206, April.
Mentions all the known records of the bird's occurrence in Florida.

PALMER, WILLIAM

1896. On the Florida Ground Owl (*Speotyto floridana*): Auk, vol. 13, pp. 99–108; pl. 2, April.
Original observations on habits.

1898. Our small eastern shrikes: Auk, vol. 15, pp. 244–258, July.
Contains records and measurements of the Loggerhead Shrike from Florida.

1901. Some birds of the Kissimmee Valley, Florida: Osprey, vol. 5, pp. 131–133, 147–149, 163–165, September, October, and December.
Notes on 113 species observed in February and March, 1895.

1909. Instinctive stillness in birds: Auk, vol. 26, pp. 23–36, January.
Contains several notes on habits of birds observed in Florida.

PALMER, WILLIAM, AND J. H. RILEY

1902. Descriptions of three new birds from Cuba and the Bahamas: Proc. Biol. Soc. Washington, vol. 15, pp. 33–34, March 5.
Contains note on the characters of the Ground Dove.

PANGBURN, CLIFFORD HAYES

1919. A three months' list of the birds of Pinellas County, Florida: Auk, vol. 36, pp. 393–405, July.
Annotated list of 135 species observed between January 22 and April 29, 1918.

PEARSON, THOMAS GILBERT

1888a. A day with the herons in Florida: Oologist, vol. 5, pp. 8–9, January.
Account of eggs of 7 species found in a rookery near Gainesville.

1888b. Notes from Alachua County, Florida: Oologist, vol. 5, p. 150, October–November.
Nesting habits of various species at Archer.

1890. Nesting of the Pied-billed Grebe: Orn. and Ool., vol. 15, pp. 152–153, October [reprinted on p. 185].
Record of 15 nests examined near Archer.

1891a. The Wood Duck: Orn. and Ool., vol. 16, pp. 134–135, September.
Notes on habits in Florida.

1891b. [Turkey Vulture]: Oologist, vol. 8, p. 164, August.
Data for several sets of eggs taken in Florida.

1891c. The American Anhinga: Orn. and Ool., vol. 16, pp. 49–50, April.
Nesting habits near Archer.

1892a. The ibises of Ledworth Lake: Oologist, vol. 9, pp. 99–100, April.
Habits of the Wood Ibis and White Ibis in Florida.

1892b. The herons of Alachua County, Florida: Orn. and Ool., vol. 17, pp. 36–37, 71–72, March, May.
Original observations on habits of 8 species.

1893. [Florida notes]: Abstr. Proc. Linn. Soc. New York, no. 5, p. 5 (presented May 18, 1892).
Mention of Passenger Pigeons seen near Archer.

1897. *Passer domesticus* at Archer, Fla., and other Florida notes: Auk, vol. 14, p. 99, January.
First record of the English Sparrow on July 1, 1896; note on Roseate Spoonbills in Tampa Bay.

1907. Florida bird notes: Bird-Lore, vol. 9, pp. 6–10, February.
Account of bird rookeries visited on the west coast of Florida, from Tampa Bay to Key West.

1911a. The Chimney Swift: Bird-Lore, vol. 13, pp. 115–118, April.

1911b. Report of Secretary [of Nat. Assoc. Audubon Societies]: Bird-Lore, vol. 13, pp. 333–340, December.
Contains estimate by O. E. Baynard of the numbers of birds breeding in Orange Lake.

1912a. The white egrets: Bird-Lore, vol. 14, pp. 62–69, 2 col. pls., February.
Habits of the American and Snowy Egrets in Florida, with notes on methods of plume hunters.

1912b. Report of the Secretary [Nat. Assoc. Audubon Societies]: Bird-Lore, vol. 14, pp. 383–392, December.
Contains estimates of numbers of herons and other birds nesting in two protected colonies in Florida.

1913a. The Green Heron: Bird-Lore, vol. 15, pp. 198–201, June.
Contains description of a nest found in a sink in central Florida.

1913b. Report of the Secretary [Nat. Assoc. Audubon Societies]: Bird-Lore, vol. 15, pp. 405–415, December.
Contains notes on egret protection in Florida and photographs of young Water-Turkeys and Brown Pelicans.

1915a. The birds on Pelican Island, Florida, have had a good season: Bird-Lore, vol. 17, p. 255, June.
Photograph of the colony.

1915b. The Bald Eagle: Bird-Lore, vol. 15, pp. 404–407, October.
Contains notes on nesting of the Eagle in Florida and on its attacking young pigs.

1915c. Florida bird-life: 2d Ann. Rept. Dept. Game and Fish [State of Florida], pp. 59–72.
Remarks on bird protection in Florida, with a nominal list of Florida birds, numbering 350 species.

1916. Black-necked Stilt: Bird-Lore, vol. 18, pp. 394–397, December.
Contains a few notes on occurrence of the Stilt in Florida.

1917. Report of the Secretary [Nat. Assoc. Audubon Societies]: Bird-Lore, vol. 19, p. 308, December.
Contains a brief report from the warden at the Tortugas, stating that 400 Sooty Terns, mostly young, lost their lives by attacks of Man-o'-war-birds and from accidents.

1918a. Death to the Pelican: Bird-Lore, vol. 20, pp. 194–198, April.
Account of a campaign to permit destruction of Pelicans in Florida, and letters from B. J. Pacetti, P. Kroegel, E. W. Nelson, Frank M. Chapman, and John M. Parker in defense of the birds.

1918b. Least Tern: Bird-Lore, vol. 20, pp. 380–383, October.
Contains records of the species at Caxambas Pass, Tampa Bay, and the Tortugas.

1918c. Report of T. Gilbert Pearson, Secretary [Nat. Assoc. Audubon Societies]: Bird-Lore, vol. 20, pp. 453–462, December.
Contains reports on condition of bird rookeries on the Tortugas and at Orange Lake.

1918d. [Remarks on birds of Alachua County, Florida]: Abstr. Proc. Linn. Soc. New York, no. 30, p. 19.
Describes changes in bird life as result of tree planting and forest destruction.

PEARSON, THOMAS GILBERT (Continued)

1919a. The case of the Brown Pelican: Amer. Review of Reviews, vol. 59, pp. 509–511, May.
Results of a study in the field of the bird's food habits.

1919b. Least Bittern: Bird-Lore, vol. 21, pp. 198–201, June.
General account of habits, and nesting record in a Florida lake.

1919c. Turkey Vulture: Bird-Lore, vol. 21, pp. 319–322, October.
Habits of the Turkey Vulture and Black Vulture in Florida.

1919d. Notes on the feeding-habits of the Brown Pelican [summary]: Abstr. Proc. Linn. Soc. New York, no. 31, pp. 7–8, December 23.
Food of the Pelicans in Florida as shown by a special investigation.

1920. The Ground Dove: Bird-Lore, vol. 22, pp. 126–129, April.
Habits as observed in Florida.

1921. *Aramus vociferus* and *Branta canadensis canadensis* in Florida: Auk, vol. 38, p. 599, October.
Records of the Limpkin on the Oklawaha River, and Canada Geese at Eureka.

1922a. Notes on the Egret situation: Bird-Lore, vol. 24, pp. 182–186, June.
Contains reports from wardens on birds nesting in the protected Florida rookeries.

1922b. Herons of the United States: Bird-Lore, vol. 24, pp. 306–314, October.
Notes on habits and distribution in Florida of the Little Blue Heron and Snowy Egret.

1922c. Report of the President [Nat. Assoc. Audubon Societies]: Bird-Lore, vol. 24, pp. 381–402, December.
Contains estimates by wardens of numbers of birds in the protected rookeries in Florida (Orange Lake, Micanopy, Spruce Creek, Island Pond, San Sebastian River, May's Pond, and Banks Pond).

1923a. Herons of the United States: Bird-Lore, vol. 25, pp. 70–79, 218–221, 355–358, February, June, October.
Biographical account of 11 species of herons and bitterns, with many Florida records.

1924a. Herons of the United States: Bul. 5, Nat. Assoc. Audubon Societies, 38 pp., 4 pls.
Biographies of 14 species, with many Florida records.

1924b. Slaughter of Brown Pelicans: Bird-Lore, vol. 26, pp. 221–222, June.
Account of an attack on the Pelican rookery in Mosquito Lagoon.

1925a. White Ibis: Bird-Lore, vol. 27, pp. 75–78, February.
Biography of the species, with numerous Florida records.

1925b. Water-Turkey: Bird-Lore, vol. 27, pp. 288–291, August.
Biography of the species; record of its breeding at Orange Lake.

1926. The Double-crested Cormorant: Bird-Lore, vol. 28, pp. 303–306, August.
Contains records of the species nesting at Lake Harris, Tampa Bay, and Sarasota Bay.

1929. Report of T. Gilbert Pearson, President [Nat. Assoc. Audubon Societies]; bird sanctuaries and reservations: Bird-Lore, vol. 31, pp. 451–453, December.
May's Pond rookery said to contain 1,000 American Egrets and 600 Snowy Egrets.

1930. Proposed Everglades National Park: Bird-Lore, vol. 32, pp. 238–240, June.
Mention of a breeding rookery of ibises and herons on the Shark River; photographs of the Wood Ibis, American Egrets, and Snowy Egrets in the Everglades.

PEARSON, T. G. (and others)

1923b. Birds of America: The University Society (Nature Lovers Library), New York, vol. 1, pp. I–XVIII, 1–272, pls. 1–39; vol. 2, pp. I–XVI, 1–271, pls. 40–75; vol. 3, pp. I–XVIII, 1–289, pls. 77–106.
Contains many references to Florida birds.

PENARD, THOMAS EDWARD (see Bangs and Penard)

PENNOCK, CHARLES JOHN ("JOHN WILLIAMS")

1889. Nesting of the Florida Cormorant: Orn. and Ool., vol. 14, pp. 154–155, October.
Observations made on a rookery near St. Marks.

1890. Note on the nesting of *Buteo brachyurus* at St. Marks, Florida: Auk, vol. 7, pp. 56–57, January.
Description of nest and egg taken in May, 1889—the first Florida record.

1901a. [Notice of capture of an Ivory-billed Woodpecker (*Campephilus principalis*) in Florida : Abstr. Proc. Delaware Valley Orn. Club, no. 4, 1900 (1901), p. 2.
Record of capture of a specimen in Taylor County in January, 1900.

1901b. [Note on a Florida Cormorant rookery]: Proc. Delaware Valley Orn. Club, no. 4, p. 6.
Rookery near St. Marks.

1901c. Recent capture of Ivory-billed Woodpeckers (*Campephilus principalis*) in Florida: Proc. Delaware Valley Orn. Club, no. 4, p. 8.
Record and measurements of two specimens taken near St. Marks.

1917. Some notes from St. Marks, Florida: Wilson Bul., vol. 29, pp. 165–166, September.
Records of Ivory-billed Woodpecker and 3 other species seen near St. Marks.

1918a. Some Florida herons: Wilson Bul., vol. 30, pp. 48–55, June.
Description of breeding colonies of the Louisiana and Little Blue Herons.

1918b. A vulture census and some notes: Wilson Bul., vol. 30, pp. 75–83, September.
Account of the Turkey Vulture and the Black Vulture.

1918c. Birds about our lighthouse: Wilson Bul., vol. 30, pp. 87–90, September.
Annotated list of birds observed at St. Marks Light.

1919a. The Gray Kingbird in Wakulla County, Florida: Wilson Bul., vol. 31, pp. 55–58, June.
Habits of *Tyrannus dominicensis*, and mention of other species.

1919b. Unusual nesting sites of Crested Flycatchers at St. Marks, Florida: Wilson Bul., vol. 31, pp. 65–66, June.

1919c. Purple Martins at St. Marks, Florida: Wilson Bul., vol. 31, pp. 71–83, September.

1919d. Notes from St. Marks, Florida: Auk, vol. 36, pp. 586–587, October.
Brief notes on occurrence of 5 species.

1919e–1920a. Notes on birds of Wakulla County, Florida: Wilson Bul., vol. 31, pp. 103–117, December, 1919; vol. 32, pp. 5–12, 48–58, March and June, 1920.
Annotated list of 239 species.

1920b. The Black Rail at St. Marks, Florida: Auk, vol. 37, pp. 128–130, January.
Seven specimens recorded, including several immature.

1920c. Notes from St. Marks, Florida: Auk, vol. 37, pp. 142–143, January.
Records of 12 species.

1921. Sprague's Pipit—*Anthus spraguei*—in Florida: Wilson Bul., vol. 33, p. 195, December.
Record of specimen taken near Punta Gorda.

1922. Florida Burrowing Owl (*Speotyto floridana floridana* Ridgway): Wilson Bul., vol. 34, pp. 21–28, March.
Habits as observed near Punta Gorda, Fla.

1929a. Forty years ago in Florida: Florida Naturalist, vol. 2, pp. 44–49, January.
Running account of trips to St. Marks and Goose Creek in 1887 and 1889.

1929b. Winter notes from south Florida: Auk, vol. 46, pp. 249–250, April.
Notes on early nesting of the Florida Cormorant, Water-Turkey, Turkey Vulture, and Barred Owl.

1929c. Vagaries regarding bird life in Florida in 1889 and 1929: Florida Naturalist, vol. 2, pp. 88–90, July.
Notes on birds observed in Wakulla County and near Punta Gorda.

"Pericles"

1893. Among the Snake Birds: Oologist, vol. 10, pp. 148–152, May.
Nesting habits of *Anhinga anhinga* in Florida.

Peters, James Lee

1925a. Notes on the taxonomy of *Ardea canadensis* Linné: Auk, vol. 42, pp. 120–122, January.
Megalornis canadensis pratensis (Meyer) revived for the Florida Sandhill Crane; type locality fixed in Clay County.

PETERS, JAMES LEE (Continued)

1925b. A review of the Limpkins (*Aramus* Vieillot): Occ. Papers Boston Soc. Nat. Hist., vol. 5, pp. 141–144, January 30.

The North American species is referred to *Aramus pictus pictus* Meyer, based on Bartram; type locality, St. Johns River; numerous Florida records.

1927. The North American races of *Falco columbarius:* Bul. Essex County Orn. Club, 1926 [May 9, 1927], pp. 20–26.

Recognizes *Falco c. bendirei* Swann and records specimens of that race from Key West and the Tortugas.

PHELPS, FRANK MILLS

1912. A March bird list from the Caloosahatchee River and Lake Okeechobee: Wilson Bul., vol. 24, pp. 117–125, 7 pls., September.

Annotated list of 93 species observed in March, 1912; photographs of Caracara and Bald Eagle.

1914a. The resident bird life of the Big Cypress Swamp region: Wilson Bul., vol. 26, pp. 86–101.

A list of 65 species observed in the spring of 1913, with notes on breeding habits.

1914b. How birds are increasing in Florida: Forest and Stream, vol. 83, pp. 308–309, September 5.

A reprint (in part) of the article by Phelps in Wilson Bulletin for June, 1914, on The Resident Bird Life of the Big Cypress Swamp Region.

PHILIPP, PHILIP BERNARD

1910. Florida Screech Owl on nest: Bird-Lore, vol. 12, p. 66, April.

Photograph.

1911. Report of P. B. Philipp on Bird Island, Orange Lake, Florida, 1911: Bird-Lore, vol. 13, pp. 358–362, December.

Description of nesting of various herons, egrets, etc.; photographs of the White Ibis, Glossy Ibis, Water-Turkey, and Little Blue Heron.

1915. Two Florida rookeries: Abstr. Proc. Linn. Soc. New York, nos. 26–27, p. 2, 1914 (November 23, 1915).

Notes on birds seen at Orange Lake and Pelican Island.

PHILIPP, P. B., AND T. F. WILCOX

1913. Notes made on birds in Florida, 1908: Abstr. Proc. Linn. Soc. New York for 1909 (February 8, 1913), pp. 16–17.

Observations made in Lake County and along the west coast.

PHILLIPS, JOHN CHARLES

1912. A reconsideration of the American Black Ducks with special reference to certain variations: Auk, vol. 29, pp. 295–306, July.

Discussion of the validity of the race *Anas fulvigula maculosa*, and description of Florida specimens of *fulvigula*.

1916. A note on the Mottled Duck: Auk, vol. 33, pp. 432–433, October.

Discussion of characters separating *Anas fulvigula fulvigula* from *A. f. maculosa*.

1922–1926. A natural history of the ducks. Vol. 1, xi + 264 pp. (1922); vol. 2, xii + 409 pp. (1923); vol. 3, xi + 383 pp. (1925); vol. 4, xi + 489 pp. (1926).

Contains much information on Florida species.

PHILLIPS, J. C., AND FREDERICK C. LINCOLN

1930. American waterfowl, their present situation and the outlook for their future. 312 pp.

Contains a few notes on habits and distribution of ducks in Florida.

"PICUS"

1898. A collecting trip in the Thousand Islands: Oologist, vol. 15, pp. 60–63, July.

Running account of a trip on the Indian River with remarks on nesting habits of various herons.

PIERCE, RAY VAUGHAN

1907. Geese on St. Vincent Island: Forest and Stream, vol. 69, p. 938, December 14.

Account of two Canada Geese killed from a flock.

1908. Game on St. Vincent Island: Forest and Stream, vol. 71, p. 855, November 28.
Mention of several species of waterfowl on the island; account of a Mallard so gorged with acorns it could not fly.

PIKE, EUGENE ROCKWELL

1931. Roseate Spoonbills in Florida: Auk, vol. 48, pp. 423–424, July.
Records of several flocks of Spoonbills and of a few other species in the Cape Sable region in 1929 and 1930.

PLATH, KARL

1913. The Tropic Birds of Bermuda: Bird-Lore, vol. 15, p. 345.

PREBLE, EDWARD ALEXANDER

1908. A biological investigation of the Athabaska-Mackenzie region: North Amer. Fauna, no. 27, 574 pp., October 26.

PREBLE, E. A., AND W. L. MCATEE

1923. Birds of the Pribilof Islands, Alaska: North Amer. Fauna, no. 46, pp. 10–101, June 20.

PREBLE, GEORGE HENRY

1905. The diary of a canoe expedition into the Everglades and interior of southern Florida in 1842: The United Service, 3d series, vol. 8, no. 1, pp. 26–46, July.
Account of an expedition of 87 men in 16 canoes journeying from Fort Dallas [Miami] through the Everglades to Lake Okeechobee and the Kissimmee River to Lake Tohopekaliga; contains many notes on the bird life of the region.

PREETORIUS, MRS. W. C.

1928. Florida Jay makes a friend: Florida Naturalist, vol. 1, p. 78, July.
Photograph of tame birds at New Port Richey.

QUAINTANCE, ALTUS LACY

1888a. Jottings from Florida: Oologist, vol. 5, pp. 5–6, January.
Records of various species nesting near Archer.

1888b. Brown-headed Nuthatch: Oologist, vol. 5, p. 91, June.
Notes on nesting habits at Archer.

1890. The Pileated Woodpecker in Florida: Oologist, vol. 7, pp. 86–87, May.
Nesting habits near Lake City.

READ, A. C.

1909. [Letter to the editor]: Oologist, vol. 26, p. 10, January.
List of birds seen between Miami and Knight's Key, Fla., December 2, 1908.

1913. Birds seen on a long journey: Oologist, vol. 30, pp. 264–268, October 15.
Nominal list of 13 species seen between Carson [= Key West?] and Jacksonville, Fla., July 5, and between Key Largo and Key West, August 2.

REED, ELIZABETH A.

1908. Protecting young birds from the cats: Bird-Lore, vol. 10, p. 215, October.
Notes on nesting of Blue Jay and Cardinal.

REHN, JAMES ABRAM GARFIELD

1905. Bachman's Warbler in Leon County, Florida: Auk, vol. 22, p. 85, January.
Record of a specimen taken March 22, 1904.

REHN, J. A. G., AND MORGAN HEBARD

1916. Studies in the Dermaptera of the coastal plain and Piedmont region of the southeastern United States: Proc. Acad. Nat. Sci. Philadelphia, vol. 68, pp. 87–314, May.
Studies in the life zones; "Sabalian Zone" proposed (p. 104).

REYNOLDS, [A. G.?]

1908. Man-o'-war: Oologist, vol. 25, p. 121, August.
Man-o'-war-bird said to nest on Bird Key, near Veteran, Fla.

1910. Florida Jays: Oologist, vol. 27, p. 132, November 15.
Habits in Hillsborough County, Fla.

RHOADS, SAMUEL NICHOLSON

1892. The breeding habits of the Florida Burrowing Owl (*Speotyto cunicularia floridana*): Auk, vol. 9, pp. 1–8, January.
Observations made on the prairies west of Lake Okeechobee.

1893. The Cinnamon Teal (*Anas cyanoptera*) in Florida: Auk, vol. 10, pp. 362–363, October.
Record of a specimen killed on Lake Iamonia.

1895. Unseasonable nesting of the Ground Dove in Florida: Auk, vol. 12, pp. 79–80, January.
Record of eggs found in October at Tarpon Springs.

1907. That Cinnamon Teal record from Florida: Auk, vol. 24, pp. 435–436, October.
Confirmation of the record of a bird killed on Lake Iamonia; specimen now in Academy of Natural Sciences, Philadelphia.

RIBAUT, JEAN (see Connor, J. T.)

RICHARDS, E. A.

1885. A Florida heronry: Orn. and Ool., vol. 10, pp. 100–101, July.
Description of a large rookery on Lake Gentry.

RIDGWAY, ROBERT

1869. Notices of certain obscurely known species of American birds: Proc. Acad. Nat. Sci. Philadelphia, pp. 125–135.
Quiscalus aglaeus characterized and assigned to southern Florida.

1873a. On some new forms of American birds: Bul. Essex Inst., vol. 5, pp. 197–201, December.
Contains original descriptions of *Ammodramus maritimus* var. *nigrescens*, type from Indian River; and *Scops asio* var. *floridanus*, type from Indian River.

1873b. The grouse and quails of North America, discussed in relation to their variation with habitat: Forest and Stream, vol. 1, pp. 289–290, December 18.
Quail of southern Florida said to be intermediate between the Cuban Quail and those of the middle United States.

1874a. Notes upon American water birds: Amer. Nat., vol. 8, pp. 108–111, February.
Contains original description of *Anas obscura* var. *fulvigula;* the type is said to have come from St. Johns River, but it actually came from Dummitts, Indian River.

1874b. Discovery of a Burrowing Owl in Florida: Amer. Sportsman, vol. 4, pp. 216–217, July 4.
Original description of *Speotyto cunicularia floridana* with notes on habits by N. B. Moore; also remarks on distribution of the Florida Jay, Brown-headed Nuthatch, Pine-woods Sparrow, and Loggerhead Shrike.

1875a. On *Nisus cooperi* (Bonaparte) and *N. gundlachi* (Lawrence): Proc. Acad. Nat. Sci. Philadelphia, pp. 78–88, May 11.
Contains measurements of a specimen of Cooper's Hawk from Jacksonville.

1875b. Description of a new wren from eastern Florida: Amer. Nat., vol. 9, pp. 469–470, August.
Original description of *Thryothorus ludovicianus miamensis*, type from Miami River.

1876. On geographical variation in *Dendroeca palmarum:* Bul. Nuttall Orn. Club, vol. 1, pp. 81–87, September.
Contains records of specimens taken in Florida.

1878a. Eastward range of *Chondestes grammaca:* Bul. Nuttall Orn. Club, vol. 3, pp. 43, 44, January.
Record of a specimen from Florida in the United States National Museum.

1878b. Synopsis of the American genera of Ardeidae and Ciconiidae, including descriptions of three new genera and a monograph of the American species of the genus *Ardea*, Linn.: Bul. Geol. and Geog. Surv. Ter., vol. 4, pp. 219–251, February 5.
Contains original description of genus *Dichromanassa* and extended account of habits and characters of the Great White and Great Blue Herons.

1878c. A review of the American species of the genus *Scops*, Savigny: Proc. U. S. Nat. Mus., vol. 1, pp. 85–117, August.
Contains description of a specimen of the Florida Screech Owl from Indian River.

1880a. Revisions of nomenclature of certain North American birds: Proc. U. S. Nat. Mus., vol. 3, pp. 1–16, March 27.
Contains (p. 8) original description of *Strix nebulosa alleni*, type from Clearwater, Fla.

1880b. On the supposed identity of *Ardea occidentalis* Aud. and *A. würdemanni* Baird: Bul. Nuttall Orn. Club, vol. 5, pp. 122–123, April.
Record of finding one young of each of these forms in the same nest.

1880c. A catalogue of the birds of North America: Proc. U. S. Nat. Mus., vol. 3, pp. 163–246.
Numerous species are accredited to Florida.

1881a. A hawk new to the United States: Forest and Stream, vol. 16, p. 206, April 14.
Record of capture of a Short-tailed Hawk at Oyster [Estero] Bay, Fla.

1881b. An unaccountable migration of the Red-headed Woodpecker: Bul. Nuttall Orn. Club, vol. 6, pp. 120–122, April.
Contains measurements of two specimens of *Colaptes auratus* from Miami.

1881c. A hawk new to the United States: Amer. Nat., vol. 15, pp. 477–478, June.
Record of capture of a specimen of the Short-tailed Hawk at Oyster [Estero] Bay.

1881d. A review of the genus *Centurus*, Swainson: Proc. U. S. Nat. Mus., vol. 4, pp. 93–119, June.
Remarks on the Red-bellied Woodpecker in Florida and mention of specimens from Cedar Keys and Amelia Island.

1881e. On a tropical American hawk to be added to the North American fauna: Bul. Nuttall Orn. Club, vol. 6, pp. 207–214, October.
Records of the Short-tailed Hawk from Oyster [Estero] Bay and Palatka, with full descriptions of plumages, and the synonymy.

1882. On an apparently new heron from Florida: Bul. Nuttall Orn. Club, vol. 7, pp. 1–6, January.
Original description of *Ardea wardi* and discussion of its relationships.

1885. Description of a new race of the Red-shouldered Hawk from Florida: Proc. U. S. Nat. Mus., vol. 7, pp. 514–515, February 25.
Original description of *Buteo lineatus alleni*, type from Clearwater.

1886a. The Scissor-tailed Flycatcher (*Milvulus forficatus*) at Key West: Auk, vol. 3, p. 134, January.
Record of a specimen taken January 15, 1885.

1886b. On two abnormally colored specimens of the Bluebird (*Sialia sialis*): Auk, vol. 3, pp. 282–283, April.
Contains measurements of 5 Florida specimens.

1887a. Notes on *Ardea würdemanni* Baird: Proc. U. S. Nat. Mus., vol. 10, pp. 112–115.
Discussion of specific characters and measurements of 8 specimens from southern Florida.

1887b. A manual of North American birds: xi + 631 pp., 124 plates.
Contains original description of *Coccyzus maynardi*, type from Ten Thousand Islands.

1892. The hummingbirds: Rept. U. S. Nat. Mus. for 1890, pp. 253–383, 43 pls., 47 figs., July.
Contains winter records of the Ruby-throated Hummingbird from Punta Rassa and Key West.

1894. *Colinus virginianus cubanensis* not a Florida bird: Auk, vol. 11, p. 324, October.
Specimens previously referred to *cubanensis* shown to be the Florida Bob-white (*C. v. floridanus*).

1895. Bluebirds: Iowa Ornithologist, vol. 1, pp. 85–86, July.
Brief notes on condition of Bluebirds in Florida after a severe winter.

1896. Manual of North American birds. 2d ed., xiii + 653 pp., 124 pls.
Contains original description of *Cardinalis cardinalis floridanus*, type from Enterprise.

1897a. *Melopelia leucoptera* in Osceola County, Florida: Auk, vol. 14, pp. 88–89, January.
Record of a specimen killed at Kissimmee.

1897b. [Letter relating to the Blue Jay in Florida]: Osprey, vol. 2, pp. 26–27, October.
All Florida specimens seen are referred to *Cyanocitta cristata florincola*.

1898. The home of the Ivory-bill: Osprey, vol. 3, pp. 35–36, November.
Account of finding two nesting pairs in the Big Cypress Swamp, southeast of Fort Myers.

RIDGWAY, ROBERT (Continued)

1902–1919. The birds of North and Middle America: Bul. 50, U. S. Nat. Mus., parts I–VIII.
Type locality of *Helminthophila celata obscura* fixed at Enterprise, Fla. (part II p. 465;) specimen in United States National Museum. *Glottis floridanus* placed in synonymy of *G. nebularia* (part VIII p. 329).

1911. Diagnoses of some new forms of Picidae: Proc. Biol. Soc. Washington, vol. 24, pp. 31–36, February 24.
Contains original description of *Phloeotomus pileatus floridanus*, type from Prevatt's Camp, 24 miles southwest of Kissimmee.

RILEY, JOSEPH HARVEY (see Palmer and Riley)

RITCHIE, SANFORD

1928. A Pine Tree State ornithologist among the palms and mangroves: Bul. Essex County [Mass.] Orn. Club, no. 10, pp. 1–64, December.
Popular account of a trip from the Tampa Bay region southward and along the Tamiami Trail; many birds mentioned, but without dates or definite localities.

ROBERTS, WILLIAM

1763. An account of the first discovery and natural history of Florida, with a particular detail of the several expeditions and descents made on that coast. viii + 102 pp.
"Birds are here in great plenty, such as partridges, jays, pigeons, turtle doves, thrushes crows, hawks, herons, cranes, geese, ducks, and an infinite number of others" . . .

ROE, FRANCES M. A.

1904. Some familiar Florida birds: Bird-Lore, vol. 6, pp. 185–190, December.
Popular account of habits of various species observed on the Halifax River; photographs of Blue Jay, Cardinal, Red-bellied Woodpecker, and Brown Thrasher.

1906. Our garden Mockingbird: Bird-Lore, vol. 8, pp. 190–192, December.
Habits of a bird observed at Port Orange.

1909. The ways of Bob-white: Bird-Lore, vol. 11, pp. 249–251, December.
Habits of several families of Quail, as observed at Port Orange.

ROGERS, HENRY L.

1928. The Black Vulture: Oologist, vol. 45, pp. 50–52, April.
Feeding habits; notes on sense of smell.

ROMANS, BERNARD

1775. A concise natural history of east and west Florida. New York, lxxxix + 342 pp.
Description of the country and the Indians, from personal explorations; brief mention of Turkeys, which were abundant near the mouth of the St. Lucie River.

ROOSEVELT, ROBERT BARNWELL

1884. Florida and the game water birds of the Atlantic coast and the lakes of the United States. 443 pages.
Contains a chapter on Florida, describing the country along the St. Johns River, with brief mention of Limpkins and a few other birds.

ROOSEVELT, THEODORE

1917. Harpooning devilfish: Scribner's Mag., vol. 62, pp. 293–305, September.
Contains notes on Brown Pelicans, ibises, herons, etc., seen near Captiva Island.

RYMAN, CLARENCE PINE

1908. Capture of the Flamingo at Lake Worth, Florida: Auk, vol. 25, p. 313, July.
Record of a specimen taken in May, 1905.

RYMAN, J. J.

1904. A season with the Bald Eagles: Oologist, vol. 21, pp. 85–88, June.
Nesting habits near Palm Beach.

1905. Bald Eagle experiences in Florida: Oologist, vol. 22, pp. 5–8, January.
Nesting habits near Palm Beach.

SALTONSTALL, LEVERETT (see Griscom, Bettle, and Saltonstall)

SALVADORI [PALEOTTI], ADELARDO TOMMASO

1891. Catalogue of the Psittaci, or parrots, in the collection of the British Museum. 658 pp., 18 pls.
Contains records of specimens of the Carolina Paroquet from eight localities in Florida.

SAFFORD, WILLIAM EDWIN

1919. Natural history of Paradise Key and the near-by Everglades of Florida: Ann. Rept. Smithsonian Inst. for 1917, pp. 377–434, pls. 1–64.
Contains (pp. 419–423) casual remarks on birds found in the Royal Palm State Park and a colored plate of the Roseate Spoonbill.

SANFORD, LEONARD CUTTER, LOUIS B. BISHOP, AND THEODORE S. VAN DYKE

1903. The waterfowl family. 579 pp.
Contains account of the Florida Duck and a few casual references to other Florida birds.

SANFORD, SAMUEL

1909. The topography and geology of southern Florida: Second Ann. Rept., Florida State Geol. Surv., pp. 177–231.

SAUNDERS, HOWARD

1878. On the Larinae or gulls: Proc. Zool. Soc. London, pp. 155–212.
Casual mention of occurrence of several species in Florida; Great Black-backed Gull said to occur in winter.

SAUNDERS, WILLIAM EDWIN

1900a. An ornithological incursion into Florida, February, 1900: Ottawa Natu., vol. 14, pp. 101–107.
Popular account of a trip to St. Augustine, Indian River, Oklawaha River, and Tarpon Springs; mention of many birds seen.

1900b. The finding of a Flamingo's nest: Ottawa Naturalist, vol. 14, pp. 135–136, October.
Account of nests found in a mangrove swamp near the southern extremity of Florida, as related by Capt. S. D. Kendall; clearly unreliable, as the nests were said to be made of sticks.

SAVARY, WALTER BURGESS

1929. A page from my diary: Oologist, vol. 46, pp. 156, 158, December.
Observations on numerous birds in Florida (locality not stated).

SCHRODER, HUGO H.

1919. Bird-Lore's nineteenth Christmas census: Bird-Lore, vol. 21, p. 40, February.
Records of 68 species seen at Fort Pierce, December 24, 1918.

1923. Notes from Fort Pierce, Florida: Bird-Lore, vol. 25, pp. 122–123, April.
Numerous records of birds observed in 1918 and 1919.

1928. Bird-Lore's twenty-eighth Christmas census: Bird-Lore, vol. 30, p. 48, February.
Records of 53 species observed at Fort Myers and vicinity, December 24, 1927.

1929. Bird-Lore's twenty-ninth Christmas census: Bird-Lore, vol. 31, p. 43, February.
Records of 59 species observed near Orlando, December 23, 1928.

SCHWARZ, EUGENE AMANDUS

1888. The insect fauna of semitropical Florida with special regard to the Coleoptera: Entomologica Americana, vol. 4, pp. 165–175.
Treats of the origin and extent of the semitropical fauna of southern Florida.

"SCOLOPAX" (see Gibbs, R. M.)

SCOTT, WILLIAM EARLE DODGE

1881. On birds observed in Sumpter, Levy, and Hillsboro Counties, Florida: Bul. Nuttall Orn. Club, vol. 6, pp. 14–21, January.
Field notes on birds obtained at Panasoffkee Lake and on the Gulf coast.

1887a. Some rare Florida birds: Auk, vol. 4, pp. 133–135, April.
Records of four species from the west coast, including description of an abnormal plumage of the Prairie Warbler.

1887b. The present condition of some of the bird rookeries of the Gulf coast of Florida: Auk, vol. 4, pp. 135–144, 213–222, 273–284, April, July, and October.
An important paper, showing extensive destruction of birds for millinery purposes.

Scott, William Earle Dodge (Continued)

1887c. Another Bachman's Warbler in Florida: Auk, vol. 4, p. 348, October.
Record of a specimen taken at Key West, August 30, 1887.

1888a. On the avi-fauna of Pinal County, with remarks on some birds of Pima and Gila Counties, Arizona: Auk, vol. 5, pp. 29–36, January.
Contains mention of a specimen of *Piranga rubra* from Tarpon Springs, Fla., taken in October in the brilliant plumage of spring.

1888b. Supplementary notes from the Gulf coast of Florida, with a description of a new species of Marsh Wren: Auk, vol. 5, pp. 183–188, April.
Records of 26 species, and original description of *Cistothorus* [= *Telmatodytes*] *marianae*, type from Tarpon Springs.

1888c. A summary of observations on the birds of the Gulf coast of Florida: Auk, vol 5, pp. 373–379, October.
Notes on 37 species, with data on the disappearance of several species of terns.

1888d. Bachman's Warbler (*Helminthophila bachmani*) at Key West, Florida, in July and August: Auk, vol. 5, pp. 428–430, October.
Many specimens taken between July 26 and August 9, 1888.

1888e. *Dendroica coronata* at Key West in summer: Auk, vol. 5, p. 430, October.
Record of an adult female specimen taken July 28, 1888.

1889a. A summary of observations on the birds of the Gulf coast of Florida: Auk, vol. 6, pp. 13–18, 152–160, 245–252, 318–326, January, April, July, and October.
Notes on 161 species.

1889b. Records of rare birds at Key West, Florida, and vicinity, with a note on the capture of a dove (*Geotrygon montana*) new to North America: Auk, vol. 6, pp. 160–161.
Notes on occurrence of 5 species.

1889c. On the specific identity of *Buteo brachyurus* and *Buteo fuliginosus*, with additional records of their occurrence in Florida: Auk, vol. 6, pp. 243–245, July.
Buteo fuliginosus shown to be a color phase of *Buteo brachyurus*.

1889d. A second specimen of Cory's Bittern (*Botaurus neoxenus*): Auk, vol. 6, pp. 317–318, October.
Description of a specimen taken in the Everglades.

1890a. A summary of observations on the birds of the Gulf coast of Florida: Auk, vol. 7, pp. 14–22, 114–120, January and April.
Notes on 64 species; original description of *Sitta carolinensis atkinsi*, type from Tarpon Springs.

1890b. The Key West Quail-dove (*Geotrygon martinica*) at Key West: Auk, vol. 7, p. 90, January.
Record of a specimen taken September 15, 1889—the first since Audubon's record in 1832.

1890c. An account of Flamingoes (*Phoenicopterus ruber*) observed in the vicinity of Cape Sable, Florida: Auk, vol. 7, pp. 221–226, July.
Observations in February, 1890, on a flock of about 1,000 birds; incidental mention of numerous other species seen.

1890d. Two species of swallow new to North America: Auk, vol. 7, pp. 264–265.
Records of capture of the Cuban Cliff Swallow and the Bahama Swallow on the Tortugas.

1890e. On birds observed at the Dry Tortugas, Florida, during parts of March and April, 1890: Auk, vol. 7, pp. 301–314, October.
Notes on 80 species.

1890f. Description of a new subspecies of Wild Turkey: Auk, vol. 7, pp. 376–377, October.
Original description of *Meleagris gallopavo osceola*, type from Tarpon Springs.

1890g. The Little Black Rail (*Porzana jamaicensis*) at Key West, Florida: Auk, vol. 7, p. 400, October.
Record of a bird captured alive, March 11, 1890.

1891a. Notes on the nest and habits of Cory's Bittern (*Botaurus neoxenus*): Auk, vol. 8, pp. 309–310, July.
Observations by J. F. Menge at Fort Thompson.

1891b. Florida heron rookeries: Auk, vol. 8, pp. 318–319, July.
Letter to the editor relative to conditions in the bird rookeries on the Gulf coast—a reply to H. K. Jamison.

1892a. A description of the adult male of *Botaurus neoxenus* (Cory), with additional notes on the species: Auk, vol. 9, pp. 141–142, April.
Description of 3 specimens from Lake Okeechobee and Lake Flirt.

1892b. Notes on the birds of the Caloosahatchee region of Florida: Auk, vol. 9, pp. 209–218, July.
A nominal list of 259 species, with biographical notes on 15 species.

1892c. Observations on the birds of Jamaica, West Indies: Auk, vol. 9, pp. 369–375, October.

1893. [Florida bird notes]: Abstr. Proc. Linn. Soc. New York, no. 5, pp. 5–6 (presented May 18, 1892).
Records of the Florida Burrowing Owl, Audubon's Caracara, and Florida Turkey.

1904. The story of a bird lover. xi + 372 pp.
Contains several chapters devoted to an account of the author's experiences as a bird collector in Florida.

SENNETT, GEORGE BURRITT

1888. A new form of Clapper Rail: Auk, vol. 5, pp. 305–306, July.
Original description of *Rallus longirostris scotti*, types from Charlotte Harbor.

SHARP, DALLAS LORE

1930. The Florida flatwoods: Nature Mag., vol. 16, pp. 211–213, October.
Popular account of Florida Cranes seen near Jupiter.

SHARPE, RICHARD BOWDLER

1896. Catalogue of the Limicolae in the collection of the British Museum: Cat. Birds British Mus., vol. 24, 769 pp., 7 pls.
Contains a few records of birds from Florida.

SHIRAS, GEORGE, 3D

1909. Male and female Quail in orange grove: Bird-Lore, vol. 11, p. 250, December.
Photograph taken near the Halifax River.

1912. Florida Bob-whites: Bird-Lore, vol. 14, p. 274, October.
Photograph taken at Ormond.

1913. Cardinal and Ground Doves: Bird-Lore, vol. 15, p. 19, February.
Photograph taken at Ormond.

1917. An Ormond (Fla.) Blue Jay: Bird-Lore, vol. 19, p. 249, October.
Photograph of a Blue Jay, with comment on its characters.

SHUFELDT, ROBERT WILSON

1887. The wanton destruction of the Florida heronries: Science, vol. 10, pp. 47–48, July 22.
An appeal for legislation to save the herons and egrets of southern Florida; alludes to his visit to Charlotte Harbor 25 years previously.

1912. Study of the eggs of the Meleagridae: Condor, vol. 14, pp. 209–213, November.
Contains description of the eggs of the Florida Turkey.

1918. Notes on some bird fossils from Florida: Auk, vol. 35, pp. 357–358, July.
Record of bones of the Wild Turkey from Pleistocene cavern deposits at Ocala.

SIMONS, M. H.

1881. Migration of shorebirds: Forest and Stream, vol. 17, p. 288, November 10.
Records of numerous species seen at Charlotte Harbor, Key West, and Mosquito Inlet.

SIMPSON, CHARLES TORREY

1920. In lower Florida wilds; a naturalist's observations on the life, physical geography, and geology of the more tropical parts of the State. 404 pp., 64 pls., 2 maps.
Contains a map of the tropical area in southern Florida.

1923. Out of doors in Florida. xii + 412 pp.; many illustrations.
Description of physical features of many parts of Florida, with a few notes on birds and a list of tropical trees on Merritt Island.

SIMPSON, E. P.

1913a. Florida's bird migrations: Amer. Field, vol. 79, p. 414, May 3.
General remarks on migration.

1913b. The Snake-bird or Anhinga—the Cormorant's affinity: Amer. Field, vol. 79, pp. 529–530, June 7.
General account of habits as observed on St. Johns River near Melbourne.

SIRROM, G.

1893. Nesting of the Brown Pelican: Orn. and Ool., vol. 18, pp. 74–75, May.
Account of a visit to the Pelican Island rookery in February, 1891.

SKINNER, ALANSON

1911. Bird-life on the Everglades: Bird-Lore, vol. 13, pp. 288–291, December.
Running account of numerous species seen on a trip from Fort Myers through the Big Cypress and across the Everglades to Miami.

SLOAN, EMMA J., AND SARAH F. AINSWORTH

1915. Bird-Lore's fifteenth Christmas census: Bird-Lore, vol. 17, p. 37, February.
Records of 46 species observed at Daytona Beach, December 22, 1914.

SLOSSON, ANNIE TRUMBULL

1899. A tragic St. Valentine's day: Bird-Lore, vol. 1, p. 45, February.
Account of hundreds of Tree Swallows killed by a cold wave at Miami, February 12, 1899.

1901. A sudden friendship: Bird-Lore, vol. 3, pp. 94–97, June.
Account of a tame Parula Warbler at Ormond, Fla.

SMALL, JOHN KUNKEL

1913. Flora of the Florida Keys. New York, xii + 162 pp.

1916. Royal Palm Hammock: Journ. New York Bot. Garden, vol. 17, pp. 165–172, October.
Account of its history and physical features.

1917. Botanical explorations in southern Florida in 1916: Journ. New York Bot. Garden, vol. 18, pp. 98–111, pls. 195–199, May.
Account of a trip to Royal Palm Hammock and among the Florida Keys; no bird notes.

1920. A botanical excursion to the Big Cypress: Natural History, vol. 20, pp. 488–500, September–October.
Contains a few notes on birds seen, with a photograph of young Burrowing Owls and notes on habits and voice of that species.

SMITH, CHARLES LEAVELL, JR. (see Weston and Smith)

SMITH, CLARENCE A.

1890. [Extract from letter]: Oologist, vol. 7, p. 92, May.
Records of 3 species nesting at Gainesville.

SMITH, EARL R.

1927. Nesting of the Bald Eagle in Escambia County, Florida: Oologist, vol. 44, pp. 114–115, September.
Pair building, April 8; later reared young in this nest.

SMITH, GREENE

1880. *Chordiles popetue minor* in Florida: Bul. Nuttall Orn. Club, vol. 5, p. 54, January.
Specimens of the Nighthawk taken on the Homosassa River considered identical with Cuban examples.

SMITH, HUGH MCCORMICK

1895. Mortality among White-bellied Swallows in Florida: Auk, vol. 12, pp. 183–184, April.
Account of finding large numbers dead after a cold wave in February, 1895.

SMITH, LESTER WHEADON

1920. Some Florida records: Bird-Lore, vol. 22, pp. 349–350, December. Records of 7 species.

SNODGRASS, ROBERT EVANS, AND EDMUND HELLER

1902. The birds of Clipperton and Cocos Islands: Proc. Washington Acad. Sci., vol. 4, pp. 501–520, September 30.

SPRUNT, ALEXANDER, JR.

1928. The Knot (*Calidris canutus*) on the Atlantic coast in winter: Auk, vol. 45, pp. 206–207, April.
Contains notes on Knots seen by R. J. Longstreet at Daytona Beach.

SQUIRES, KARL

1928. Notes on unusual nesting in south Florida: Oologist, vol. 45, pp. 30–32, March.
Records of Sparrow Hawk, Screech Owl, Kingbird, Ward's Heron, etc.

1929. Black-whiskered Vireo on Florida Keys: Auk, vol. 46, p. 394, July.
Record of nest and eggs found on Plantation Key.

STANLEY, JAMES E.

1929. Small section of rookery containing several thousand breeding Wood Ibises, egrets, and herons of various species, Alligator Lake, near Cape Sable, Fla. [photograph]: Bird-Lore, vol. 31, p. 234, June.

STEARNS, ROBERT EDWARDS CARTER

1869. Rambles in Florida: Amer. Nat., vol. 3, pp. 281–288, 349–356, 397–405, 455–470.
General account of the fauna and flora; casual mention of several species of birds observed.

STILLMAN, WILLIAM M.

1912. Florida notes: Bird-Lore, vol. 14, pp. 164–165, June.
Notes on various species observed at Daytona.

STODDARD, HERBERT LEE

1925. Progress on cooperative quail investigation, 1924: Published by the Quail Study Fund for southern Georgia and northern Florida, L. S. Thompson, chairman. 22 pp., 3 pls.
Studies of habits of the Bob-white in Leon County.

1926a. Report on cooperative quail investigation, 1925–1926: Published by the Quail Study Fund for southern Georgia and northern Florida, L. S. Thompson, chairman. 62 pp., 5 pls.
Extensive studies of habits of the Bob-white in Leon County.

1926b. Bird-Lore's twenty-sixth Christmas census: Bird-Lore, vol. 28, pp. 35–36, February.
Records of 73 species observed in Leon County (Lakes Iamonia and Jackson), December 27, 1925.

1926c. Methods of banding Chimney Swifts in the South: Wilson Bul., vol. 38, pp. 122–123, June.
Records of banding at Tallahassee, Fla., and Thomasville, Ga.

1928a. The Flamingo in northwest Florida: Auk, vol. 45, pp. 201–202, April.
Account of an individual observed at Shell Point, Wakulla County, September 24–25, 1927.

1928b. The Rough-legged Hawk in southern Georgia and the Goshawk in Florida: Auk, vol. 45, pp. 211–212, April.
Record of a Goshawk killed in Leon County, December 1, 1926.

1931. The Bobwhite Quail: Its habits, preservation, and increase. xxix + 559 pp., 69 plates, May 8.
Exhaustive treatment of the habits of the Bob-white, as studied in southern Georgia and adjacent parts of Florida (Leon, Wakulla, and Jefferson Counties).

STODDARD, H. L., AND C. O. HANDLEY

1925. Bird-Lore's twenty-fifth Christmas census: Bird-Lore, vol. 27, p. 45, February.
Records of 70 species seen on Lake Iamonia and Lake Jackson, December 24, 1924.

1927. Bird-Lore's twenty-seventh Christmas census: Bird-Lore, vol. 29, pp. 32–33, February.
Records of 72 species observed on Lakes Iamonia and Jackson, December 24, 1926.

1928. Bird-Lore's twenty-eighth Christmas census: Bird-Lore, vol. 30, p. 48, February.
Records of 89 species seen at Lakes Iamonia and Jackson, December 24, 1927.

1929. Bird-Lore's twenty-ninth Christmas census: Bird-Lore, vol. 31, p. 43, February.
Records of 86 species observed on Lakes Iamonia and Jackson, December 24, 1928.

STONE, DWIGHT D.

1885. Bird visitors at a Florida Light House: Orn. and Ool., vol. 10, pp. 157–158, October.
Account of birds striking the light at Warrington; mention of capture of 4 young Flamingoes.

STONE, DWIGHT D. (Continued)

1886. Bird destruction: Orn. and Ool., vol. 11, p. 176, November.
Mention of large numbers of Robins and Cedarbirds killed for food at Warrington.

1896. Collecting in Florida: Nidologist, vol. 3, pp. 132–133.
Field notes on several species observed in the region of Lake Okeechobee.

STONE, WITMER

1897. The genus *Sturnella:* Proc. Acad. Nat. Sci. Philadelphia, pp. 146–152, April 21.
Contains remarks on the characters of the Florida Meadowlarks.

1906. A bibliography and nomenclature of the ornithological works of John James Audubon: Auk, vol. 23, pp. 298–312, July.
Contains list of new species of birds described by Audubon from Florida.

STONER, DAYTON AND LILLIAN C.

1925. Bird-Lore's twenty-fifth Christmas census: Bird-Lore, vol. 27, p. 44, February.
List of 48 species seen at Gainesville, December 27, 1924.

1928. Bird-Lore's twenty-eighth Christmas census: Bird-Lore, vol. 30, p. 48, February.
Records of 50 species seen at Gainesville, December 22, 1927.

STORK, WILLIAM

1766a. Account of East Florida. i–xxii, 23–90 pp.
Contains brief mention of a few birds—Wild Turkeys, "pheasants," American partridge [Bob-white], Wild Pigeons, etc.

1766b. An extract from the account of East Florida . . . with the observations of Denys Rolle, etc., 39 pp.

1769. A description of East Florida, with a journal, kept by John Bartram of Philadelphia, Botanist to His Majesty for the Floridas; upon a journey from St. Augustine up the River St. Johns as far as the Lakes.
Illustrated with an accurate map of East Florida and two plans, one of St. Augustine and the other of the Bay of Espiritu Santo (Tampa Bay). 3d ed., pp. viii + 40; xii + 35. The bird matter is a reprint of the 1766 edition; Bartram's journal is replete in description of the vegetation, but mentions only casually birds seen on the St. Johns River.

STRONG, WILLIAM ABNER

1923. Large sets: Oologist, vol. 40, pp. 64–70, April.
Contains a number of records of eggs taken in Florida.

SUTTON, GEORGE MIKSCH (see also Holt and Sutton)

1924. A visit to a Wood Ibis colony: Bird-Lore, vol. 26, pp. 391–395, 1 pl., December.
Description of a colony on Alligator Lake.

SWANN, HARRY KIRKE

1922. [Remarks on bird collections in American museums]: Bul. British Orn. Club, vol. 42, pp. 65–68, February 2.

SWANSON, GUSTAV

1928. The bander is found: Wilson Bul., vol. 40, p. 251, December.
A Marsh Hawk killed in Brevard County, Fla., had been banded at Cokato, Minn.

SWINDELL, FRANK AVERY (see McClanahan, Swindell, and Weston)

TABER, WILLIAM BREWSTER, JR.

1930. The fall migration of Mourning Doves: Wilson Bul., vol. 42, pp. 17–28, March.
Contains several records of banded Doves taken in Florida.

TARRANT, W. P.

1883. "Monkey-faced owls": Orn. and Ool., vol. 8, p. 87, November.
Record of Barn Owls taken at St. Augustine.

TAVERNER, PERCY ALGERNON

1926. Birds of western Canada: Victoria Mem. Mus., Bul. 41, 380 pp., September 15.

TAYLOR, GEORGE CAVENDISH

1862. Five weeks in the peninsula of Florida during the spring of 1861, with notes on the birds observed there: Ibis, vol. 4, pp. 127–142 (April), 197–207 (July).
List of 61 species observed at New Smyrna and on the St. Johns River from Enterprise to Jacksonville; extracts from the author's journal describing his collecting experiences.

THAYER, JOHN ELIOT, AND OUTRAM BANGS

1909. Description of a new subspecies of the Snowy Heron: Proc. New England Zool. Club, vol. 4, p. 41, April 29.
Contains records of the Snowy Egret from Florida.

THOMPSON, JOSEPH

1903. The Tortugas tern colony: Bird-Lore, vol. 5, pp. 77–84, June.
Habits of the Noddy, Sooty, and Least Terns, and the Man-o'-war-bird.

THOMPSON, MAURICE

1878. The witchery of archery. 259 pp.
Contains accounts of experiences on the St. Johns River and Lake Okeechobee, with numerous allusions to birds seen.

1885. By-ways and bird notes. 179 pp.
Consists of charming essays on bird life, as observed chiefly in Florida and Georgia.

THURSTON, HENRY

1910. In the haunt of the snowy: Warbler, vol. 6, pp. 19–21.
Nesting of the Snowy Heron at Seven Oaks.

1913a. An apparently heretofore unfigured plumage of *Conuropsis carolinensis:* Warbler, vol. 7, pp. 13–14, pl. 2.
Record of a specimen of the Carolina Paroquet taken at Lake Loehe, Polk County, October 7, 1892.

1913b. Wilson's Plover: Warbler (ser. 2), vol. 7, pp. 22–24.
Breeding habits as observed at Tampa Bay.

1913c. The Gray Kingbird at home: Bird-Lore, vol. 15, pp. 165–168, June.
Nesting habits at Seven Oaks.

TICHENOR, LOTTIE B. AND MARTHA K., AND SARAH F. AINSWORTH

1913. Bird-Lore's thirteenth bird census: Bird-Lore, vol. 15, p. 33, February.
Records of 40 species seen at Daytona Beach, December 23, 1912.

TICHENOR, MARTHA K.

1917. Bird-Lore's seventeenth Christmas census: Bird-Lore, vol. 19, p. 28, February.
Records of 40 species observed at Daytona Beach, December 27, 1916.

TODD, WALTER EDMOND CLYDE (see also Worthington and Todd)

1913. A revision of the genus *Chaemepelia:* Annals Carnegie Mus., vol. 8, pp. 507–603, March.
Contains critical notes on a few Florida specimens of the Ground Dove.

1916. The birds of the Isle of Pines: Annals Carnegie Mus., vol. 10, pp. 146–296.
Contains records and measurements of Florida specimens of the Limpkin, Florida Crane, and other species.

1928. A new Blue Jay from southern Florida: Auk, vol. 45, pp. 364–365, July.
Original description of *Cyanocitta cristata semplei*, type from Coconut Grove.

TOMASSON, T.

1890. Nesting of the Florida Cormorant; Orn. and Ool., vol. 15, p. 11, January.
Description of a nesting colony on the Miakka River.

TORREY, BRADFORD

1894. A Florida sketch book, 237 pp.
Consists of 10 essays dealing with birds seen in northern Florida.

1904. Nature's invitation—notes of a bird-gazer, north and south. 300 pp.
Contains 10 essays on bird life around Miami and Ormond.

TOUSSAINT, MRS. L. H.

1913. My bird neighbors: Bird-Lore, vol. 15, pp. 358–361, December.
Account of taming numerous species of birds at Rio, Fla.; photographs of the Florida Crane and American Egret.

1914. Jack: Blue-bird, vol. 7, pp. 23–25, 1 pl., October.
Habits of a Sandhill Crane in captivity at Rio, Fla.

1915. My southern jays: Blue-bird, vol. 7, pp. 130–132, February.
Account of tame jays (probably *Aphelocoma coerulescens*) at Rio.

TOWNSEND, CHARLES HASKINS

1897. Descriptions of a new eagle from Alaska and a new squirrel from Lower California: Proc. Biol. Soc. Washington, vol. 11, pp. 145–146, June 9.
Contains measurements of Florida specimens of the Bald Eagle.

1927. Old times with the birds: autobiographical: Condor, vol. 29, pp. 224–232, September.
Mention of a specimen of the Carolina Paroquet taken near Fort Myers.

TOWNSEND, CHARLES WENDELL

1905. The birds of Essex County, Massachusetts: Memoirs Nuttall Orn. Club, no. 3, pp. 1–352, April.

1926a. The European Starling in Mississippi and in Florida: Auk, vol. 43, p. 371, July.
Four Starlings seen at Wakulla Beach, January 26, 1926.

1926b. Thrills of an eastern ornithologist in the south: Bird-Lore, vol. 28, pp. 319–323, October.
Account of a visit to a rookery of Wood Ibises, Roseate Spoonbills, and other species in Alligator Lake, and notes on Limpkins in the St. Johns River marshes.

1927. Notes on the courtship of the Lesser Scaup, Everglade Kite, Crow, and Boat-tailed and Great-tailed Grackles: Auk, vol. 44, pp. 549–554, October.
Original observations made in Florida; rattling notes of the Boat-tailed Grackle said to be vocal.

TOWNSEND, HOMER

1930. Bird list for May 2, 1930: Florida Naturalist, vol. 3, pp. 107–108, July.
List of 50 species seen between Orlando and St. Cloud.

1931. Orlando notes: Florida Naturalist, vol. 4, p. 66, April.
Records of the Tennessee Warbler, Snowy Heron, and European Starling.

TOWNSHEND, FREDERIC TRENCH

1875. Wild life in Florida, with a visit to Cuba. 319 pp.
Contains many casual references to birds seen in various parts of Florida.

TREAT, MARY

1877. Our Mocking-bird: Forest and Stream, vol. 8, pp. 112–113, March 29.
A popular article on Florida birds; no specific localities mentioned.

TYLER, WINSOR MARRETT

1920. Bonaparte's Gulls and Louisiana Herons catching fish: Wilson Bul., vol. 32, p. 64, June.
Habits as observed at Ormond Beach.

"V., C. A."

1909a. A Florida summer ramble: Forest and Stream, vol. 73, p. 290, August 21.
Random notes on birds seen on the Indian River near Pelican Island.

1909b. Days with the Florida Quail: Forest and Stream, vol. 73, pp. 494–495, September 25.
Random notes on quail, snipe, cranes, etc.

1911. Pelican Island: Forest and Stream, vol. 76, pp. 171–172, illus., p. 173, February 4.
Short history of the Pelican Island colony, with two photographs (p. 173) and account of a visit in 1910.

VANDIVEER, C. A.

1930. A two days' outing: Amer. Field, vol. 113, pp. 115–116, February 1.
Popular account of a hunting trip on marshes "westward from the Indian River"; mention of Sandhill Cranes and a few other birds seen.

VAN ROSSEM, ADRIAAN JOSEPH (see Dickey and van Rossem, and Howell and van Rossem)

VARS, HAROLD NATHANIEL

1921. Florida sunshine: Oologist, vol. 38, pp. 142–147, November.
Description of a trip in a rowboat from Jacksonville to the lower Oklawaha River, with mention of a few birds seen.

1926. Florida notes: Oologist, vol. 43, pp. 2–9, January.
Diary of a collecting trip to Merritt and Amelia Islands, with mention of many birds seen.

VIEILLOT, LOUIS PIERRE

1807. Histoire Naturelle des Oiseaux de L'Amérique Septentrionale. 2 vols.

1816. [Original description of *Plotus leucogaster* (= *Anhinga anhinga*)]: Nouv. Dict., vol. 1, p. 545.
Type from Florida.

1817. [Original description of *Garrulus cyaneus* (= *Aphelocoma coerulescens*)]: Nouv. Dict., vol. 12, p. 476.
Type from St. Augustine.

VROOMAN, DELBERT H. AND RAY HARVEY, AND R. J. LONGSTREET

1913. Bird-Lore's thirteenth bird census: Bird-Lore, vol. 15, p. 33, February.
Records of 35 species seen at Coronado, December 25, 1912.

VROOMAN, RAY H., AND R. J. LONGSTREET

1911. Bird-Lore's eleventh bird census: Bird-Lore, vol. 13, pp. 33–34, February.
Records of 41 species seen at Coronado Beach, December 26, 1910.

1912. Bird-Lore's twelfth Christmas bird census: Bird-Lore, vol. 14, p. 32, February.
Records of 49 species seen at Coronado Beach, December 25, 1911.

"W"

1896. A dragon fly attacks a Nonpareil: Forest and Stream, vol. 47, p. 165, August 29.
Note from St. Augustine.

"W., J. F."

1888. Eagle vs. Fish Hawk: Orn. and Ool., vol. 13, pp. 118–119, August.
Account of a Bald Eagle robbing an Osprey on the Matanzas River.

WARD, CHARLES WILLIS

1884. Notes on *Ardea wardi* Ridgw.: Auk, vol. 1, pp. 161–163, April.
Description of numerous specimens from Florida; mention of finding "a white and gray bird in the same nest at Estero Bay."

1913. Across Florida for the birds: Outdoor World and Recreation, vol. 48, pp. 151–152, February.
Account of a boat trip on the Caloosahatchee River and through the Everglades; casual mention of bird life.

WARNER, E. L.

1902. Nest of the Bald Eagle: Oologist, vol. 19, p. 164, November.
Description of a nest found near Pablo Beach, Fla.

WARREN, BENJAMIN HARRY

1890. Report on the birds of Pennsylvania. 2d ed., xiv + 434 pp., 100 pls.

WATKINS, LUCIUS WHITNEY

1894. A disastrous season on Pelican Island: Oologist, vol. 11, pp. 148–150, April.
Account of a visit to Pelican Island in February, 1885, when many eggs had been destroyed by a flood.

WATSON, JOHN BROADUS

1907. Report of John B. Watson on the condition of the Noddy and Sooty Tern colony on Bird Key, Tortugas, Florida: Bird-Lore, vol. 9, pp. 307–316, December.
Detailed account of habits of the terns.

1908a. A résumé of a study upon the behavior of Noddy and Sooty Terns carried on at Bird Key during the spring of 1907: Yearbook Carnegie Inst. Washington, pp. 120–121, 1907.
Brief account of experiments conducted on the Tortugas.

WATSON, JOHN BROADUS (Continued)

1908b. The behavior of Noddy and Sooty Terns: Papers from the Tortugas Laboratory of the Carnegie Inst. Washington, vol. 2, no. 103, pp. 189–255.
Studies conducted on the Tortugas Islands.

1909. How animals find their way home: Harper's Mag., vol. 119, pp. 685–689, October.
Habits of Noddy and Sooty Terns on the Tortugas, and account of experiments on birds carried to distant points and released.

1910. Further data on the homing sense of Noddy and Sooty Terns: Science, vol. 32 (n. s.), pp. 470–473, October 7.
Account of experiments with birds transported to distant points and released.

1911. Report of Prof. John B. Watson on the work on Bird Key: Yearbook Carnegie Inst. Washington, 1910 [1911], pp. 144–146.
Summary of investigations on the habits of Sooty and Noddy Terns during 1910 (see also p. 123).

WATSON, J. B., AND K. S. LASHLEY

1915. An historical and experimental study of homing: Carnegie Inst. Washington, Papers from Dept. Marine Biol. (pub. 211), vol. 7, pp. 60, pls. 1–6.
History of the Tortugas Noddy and Sooty Tern colonies and record of the experiments made in 1907, 1910, and 1913 on homing instincts.

WAYNE, ARTHUR TREZEVANT

1893. Additional notes on the birds of the Suwannee River: Auk, vol. 10, pp. 336–338, October.
List of 44 species observed, with some biographical notes.

1895. Notes on the birds of the Wacissa and Aucilla River regions of Florida: Auk, vol. 12, pp. 362–367, October.
Nominal list of 161 species observed, with biographical notes on 8 species.

1905a. Notes on certain birds taken or seen near Charleston, South Carolina: Auk, vol. 22, pp. 395–400, October.
Contains record of a Sprague's Pipit seen at Lake Tohopekaliga, Fla., in November, 1892.

1905b. A rare plumage of the Ivory-billed Woodpecker (*Campephilus principalis*): Auk, vol. 22. p. 414, October.
Description of two specimens taken in Jefferson County.

1905c. The Orange-crowned Warbler (*Helminthophila celata*) a winter resident in South Carolina: Auk, vol. 22, p. 417, October.
Mention of its occurrence in winter on the Suwannee and Wacissa Rivers, Fla.

1906a. A contribution to the ornithology of South Carolina, chiefly the coast region: Auk, vol. 23, pp. 56–68, January.
Contains records of Mississippi Kites and Swallow-tailed Kites seen on the Suwannee River.

1906b. The American Scoter, Limpkin, and Ipswich Sparrow in South Carolina: Auk, vol. 23, pp. 231–232, April.
Contains record of the Limpkin breeding on the Wacissa River, Fla.

1907a. The nest and eggs of Bachman's Warbler, *Helminthophila bachmani* (Aud.), taken near Charleston, South Carolina: Auk, vol. 24, pp. 43–48, January.

1907b. Observations on some birds procured near Charleston, South Carolina: Auk, vol. 24, pp. 377–382, October.
Contains records of Bachman's Warbler taken in Florida.

1908. Bewick's Wren (*Thryomanes bewickii*) on the coast of South Carolina: Auk, vol. 25, p. 87, January.
Contains record of this species at Waukeenah, Fla.

1910. Birds of South Carolina: Contr. from the Charleston Mus., I, 243 pp.
Contains a number of Florida records.

1922. Discovery of the breeding grounds of the White Ibis in South Carolina: Bul. Charleston Mus., vol. 17, pp. 27–30.

1925. A late autumnal record for the Bachman's Warbler: Wilson Bul., vol. 37, p. 41, March.
Contains a record of the bird from Key West.

WEBB, DE WITT

1905. Rattlesnakes and crows: Forest and Stream, vol. 65, p. 469, December 16.
Habits of crows at St. Augustine.

WEBSTER, FRANK BLAKE

1891. Brief notes: Orn. and Ool., vol. 16, p. 172, November.
Mentions receiving from Florida a dozen skins of the American Egret.

WEED, CLARENCE MOORES, AND NED DEARBORN

1901. The food of the Myrtle Warbler: New Hampshire Col. Agr. Exp. Sta. Tech. Bul. no. 3, pp. 117–128, November.

WEST, GEORGE E.

1875. Okeechobee: Rod and Gun, vol. 6, pp. 378–379, September 18.
Account of a trip in March, 1875, from Lake Tohopekaliga down the Kissimmee River to Lake Okeechobee; mention of many birds seen.

WESTON, FRANCIS MARION (see also McClanahan, Swindell, and Weston)

1916. Some familiar birds in West Florida: Bul. Charleston Mus., vol. 12, pp. 57–59, November.
Records of numerous species near Pensacola.

1917. Airplanes and sea birds: Bul. Charleston Mus., vol. 13, pp. 34–35, May.
Actions of gulls, pelicans, and loons in Pensacola Bay.

1921. Bird-Lore's twenty-first Christmas census: Bird-Lore, vol. 23, p. 21, February.
Records of 37 species seen at Pensacola, December 25, 1920.

1924–1931. The season, Pensacola (Florida) region: Bird-Lore, vols. 26–33.
Notes on bird migrations and conditions of bird life near Pensacola. Articles under this title have appeared in each number of Bird-Lore from August, 1924, to date (1931).

1925a. Bird-Lore's twenty-fifth Christmas census: Bird-Lore, vol. 27, p. 45, February.
List of 42 species seen near Pensacola, December 28, 1924.

1925b. Golden Eagle near Pensacola, Florida: Auk, vol. 42, p. 443, July.
Record of a specimen killed at Walnut Hill.

1926. Bird-Lore's twenty-sixth Christmas census: Bird-Lore, vol. 28, pp. 36–37, February.
Records of 56 species observed at Pensacola, December 25, 1925.

1927a. Bird-Lore's twenty-seventh Christmas census: Bird-Lore, vol. 29, p. 33, February.
Records of 47 species observed near Pensacola, December 26, 1926.

1927b. Nature's camouflage—Florida Nighthawk or "bullbat" on nest: Bird-Lore, vol. 29, p. 254, August.
Photograph of a Nighthawk on its eggs at Pensacola.

1928a. West of the Apalachicola: Florida Naturalist, vol. 1, pp. 26–28, January.
Notes on migrations at Pensacola.

1928b. Bird-Lore's twenty-eighth Christmas census: Bird-Lore, vol. 30, p. 49, February.
Records of 61 species seen near Pensacola, December 26, 1927.

1928c. West of the Apalachicola, II: Florida Naturalist, vol. 1, pp. 41–43, April.
Historical account of the ornithology of the region, with remarks on occurrence of certain birds.

1928d. West of the Apalachicola, III and IV: Florida Naturalist, vol. 1, pp. 82–84; vol. 2, pp. 22–24, July and October.
Summary of bird records from published lists.

1929a. Additional notes from northwestern Florida: Florida Naturalist, vol. 2, p. 56, January.
Notes on occurrence of 4 species, including the Roseate Spoonbill.

1929b. Gray Kingbird nesting near Pensacola, Florida: Auk, vol. 46, p. 118, January.
Two nests found in 1928; also records from Apalachicola.

1929c. Notes from a winter outpost: Florida Woods and Waters, vol. 1, no. 1, pp. 12, 25, December.
Popular account of birds observed in December in northern Florida (near Pensacola?).

WESTON, FRANCIS MARION (Continued)

1930a. The Blue Goose in Escambia County: Florida Naturalist, vol. 3, p. 58, January.
Record of a bird seen at Pensacola, November 25, 1929.

1930b. The Starling appears in Escambia County: Florida Naturalist, vol. 3, pp. 58–59, January.
Flock seen near Ferry Pass, November 17, 1929; another near Gonzalez, November 24, 1929.

1930c. At the old fishin' hole: Florida Woods and Waters, summer edition, pp. 26, 40.
Popular article, with mention of many birds, presumably in Florida.

1930d. Southward, Ho! Florida Woods and Waters, fall edition, pp. 14, 37.
Description of bird migration in western Florida.

1931. Notes from Escambia County, Florida: Auk, vol. 48, pp. 442–443, July.
Records of the Gannet, Baird's Sandpiper, Upland Plover, and Painted Bunting.

WESTON, F. M., AND C. L. SMITH, JR.

1928. Baird's Sandpiper (*Pisobia bairdi*) in Florida: Auk, vol. 45, pp. 370–371, July.
Record of a specimen taken near Pensacola, April 22, 1928.

WETMORE, ALEXANDER

1916. Birds of Porto Rico: U. S. Dept. Agr. Bul. 326, 140 pp., 10 pls.

1920. Observations on the habits of birds at Lake Burford, New Mexico: Auk, vol. 37, pp. 221–247 (April), 393–412 (July).

1924. Food and economic relations of North American grebes: U. S. Dept. Agr. Bul. 1196, 24 pp., January.

1925. Food of American phalaropes, avocets, and stilts: U. S. Dept. Agr. Bul. 1359, 20 pp., October.
Contains a few notes on food of Florida birds.

1927. The birds of Porto Rico and the Virgin Islands: Scientific Survey of Porto Rico and the Virgin Islands (New York Acad. Sciences), vol. 9, parts 3 and 4, pp. 245–598, pls. 55–65.

1931. The avifauna of the Pleistocene in Florida: Smiths. Misc. Coll., vol. 85, no. 2, 41 pp., 6 plates, April 13.
Lists 65 species, three of which are extinct and nine are not found at present in the State.

WHARRAM, S. V.

1916. A pleasant day on the Halifax River: Oologist, vol. 33, p. 181, November.
Records of 45 species observed at Daytona, December 22, 1915.

WHEELER, JOHN B.

1885. Bald Eagle: Hoosier Nat., vol. 1, p. 109.
Habits in Florida.

WHITE, HARRY GORDON

1890. Geographical variation of eggs: Orn. and Ool., vol. 15, pp. 1–4, January.
Measurements of eggs of the Florida Gallinule, Florida Crow, and Loggerhead Shrike from Florida.

WHITE, ROBERT

1929. Shooting geese on the Wakulla grounds: Florida Woods and Waters, vol. 1, no. 1, p. 19, December.
Describes methods used to kill wild geese on the coast of Wakulla County.

WHITEHEAD, CHARLES EDWARD

1897. Camp-fires of the Everglades or wild sports in the south. x + 298 pp.
Contains chapters on turkey hunting and on the Florida Crane.

WHITEHEAD, R. B.

1892. A trip through "Wa-hoo Hammock": Oologist, vol. 9, pp. 71–72, March.
Mentions seeing 8 Ivory-billed Woodpeckers in interior of Florida.

WHITTLE, CHARLES LIVY

1922. A Myrtle Warbler invasion: Auk, vol. 39, pp. 23–31, January.
Contains reports of warblers migrating at Sand Key Lighthouse, Fla.

WILCOX, T. F. (see Philipp and Wilcox)

WILLARD, BERTEL GLIDDEN

1911. Status of the Bald Eagle of New England: Oologist, vol. 28, pp. 50–52, March.
Remarks on Florida specimens, with measurements of eggs.

WILLCOX, JOSEPH

1877. On the habits of *Quiscalus purpureus:* Proc. Acad. Nat. Sci. Philadelphia, p. 38, April 17.
Account of Florida Grackles eating small fish at Lake Jessup.

WILLIAMS, BELLE

1914. Scenes in a Florida rookery: Blue-Bird, vol. 6, pp. 300–303, September.
Account of a visit to Holmes Pond, near Clearwater.

"WILLIAMS, JOHN" (see Pennock, C. J.)

WILLIAMS, JOHN LEE

1827. A view of West Florida, embracing its geography, topography, etc. 178 pp.
Contains (pp. 30–32) a list of 119 species of birds, with a few brief annotations.

1837. The territory of Florida: or sketches of the topography, civil and natural history of the country, the climate, and the Indian tribes, from the first discovery to the present time. vi + 304 pp.
Contains (pp. 73–76) a list of about 77 species of birds occurring in Florida, and a few notes on habits of the Water-Turkey, Florida Crane, Roseate Spoonbill, and Flamingo.

WILLIAMS, ROBERT WHITE

1895a. Notes from Florida: Nidiologist, vol. 2, p. 126, May.
Brief records of eggs of several species taken at Tallahassee.

1895b. Nesting of the Florida Screech Owl: Nidiologist, vol. 2, pp. 168–169, August.
Records of numerous sets of eggs taken at Tallahassee.

1895c. Some pet Snowy Herons: Nidiologist, vol. 3, p. 37, November.
Habits of a bird in captivity at Tallahassee.

1896a. A hawk as a chicken incubator: Nidiologist, vol. 3, p. 133, June, July.
Account of substituting a hen's egg for an egg of Cooper's Hawk.

1896b. [Notes]: Nidiologist, vol. 3, p. 123, July.
Eggs of the Florida Screech Owl taken at Tallahassee.

1897. [Letter from Robert Ridgway]: Osprey, vol. 2, p. 27, October.
Ridgway states that he considers all Florida Blue Jays to be *Cyanocitta cristata florincola.*

1899. Nesting of the Anhinga in Leon County, Florida: Osprey, vol. 3, p. 60, December.
Nesting habits described; other species mentioned.

1901. The Vermilion Flycatcher in Florida: Auk, vol. 18, p. 273, July.
Record of a specimen taken near Tallahassee, March 25, 1901.

1902a. An albino Vesper Sparrow: Osprey, vol. 6, p. 49, March.
Record of a specimen taken at Tallahassee.

1902b. Unusual nesting date of the Barn Owl (*Strix pratincola*): Auk, vol. 19, pp. 198–199, April.
Record of eggs found at Tallahassee in December.

1904. A preliminary list of the birds of Leon County, Florida: Auk, vol. 21, pp. 449–462, October.
Annotated list of 156 species.

1906. Further notes on the birds of Leon County, Florida: Auk, vol. 23, pp. 153–161, April.
List of 47 species, with notes on habits and dates of occurrence.

1907a. Additional notes on the birds of Leon County, Florida: Auk, vol. 24, pp. 158–159, April.
List of 13 species, with notes on habits and dates of occurrence.

1907b. *Loxia curvirostra minor* in Florida: Auk, vol. 24, p. 220, April.
Record of specimens taken on Amelia Island.

1912. A glimpse into the life history of the Turkey Vulture: Bird-Lore, vol. 14, pp. 13–14, February.
Habits at Tallahassee, Fla.

1914. Notes on the birds of Leon County, Florida—third supplement: Auk, vol. 31, pp. 494–498, October.
Annotated list of 22 species.

WILLIAMS, ROBERT WHITE (Continued)
1919. Winter birds of East Goose Creek, Florida: Auk, vol. 36, pp. 45–56, January.
Annotated list of 90 species.
1927. The Blue Goose at East Goose Creek, Florida: Auk, vol. 44, p. 244, April.
Record of a bird killed November 25, 1926; also one from the Tortugas, April 5, 1859.
1928. Further notes on the birds of Leon County, Florida—fourth supplement: Auk, vol. 45, pp. 164–169, April.
Records of occurrence of 45 species.
1929a. Additions to the list of the birds of Leon County, Florida: Auk, vol. 46, p. 122, January.
Records of 5 species.
1929b. Ruby-throated Hummingbird wintering in northern Florida: Auk, vol. 46, p. 238, April.
One individual seen at Tallahassee, January 17, 19, and 26, 1929.
WILLIAMSON, THOMAS H.
1904. Birds at the Florida Keys: Recreation, vol. 20, pp. 378–380, May.
Popular account of some birds observed in the Cape Sable region.
WILLOUGHBY, HUGH L.
1898. Across the Everglades. 192 pp.
Account of a canoe trip from the head of the Harney River to Miami in 1897; casual notes on egrets, herons, Everglade Kites, Limpkins, etc.
WILLSON, MARIE G., AND DAISIE M. MORRISON
1929. Bird-Lore's twenty-ninth Christmas census: Bird-Lore, vol. 31, p. 43, February.
Records of 50 species observed at Gulfport, December 24, 1928.
1930. Bird-Lore's thirtieth Christmas Census: Bird-Lore, vol. 32, pp. 42–43, February.
Records of 78 species seen at Gulfport, December 26, 1929.
WILLSON, MINNIE MOORE
1900. American Egrets: Forest and Stream, vol. 55, p. 366, November 10.
Account of young Egrets kept in captivity.
1905. Tame Florida Egrets: Forest and Stream, vol. 64, pp. 132–133, February 18.
Account of a pair of Snowy Egrets kept in captivity.
1912a. Florida Sandhill Cranes: Forest and Stream, vol. 78, p. 146, February 3.
Account of two Cranes kept in captivity; one bird laid a set of 3 eggs; again laid 10 eggs in a season; photograph.
1912b. Bird preservation: Forest and Stream, vol. 78, pp. 531–532, April 27.
Casual notes on Florida birds; account of White Egrets kept in captivity.
1914a. Tame Florida Egrets: Blue-Bird, vol. 6, pp. 296–299, 1 pl., September.
Account of two young American Egrets kept in captivity at Kissimmee, with photograph.
1914b. Betty and Dixie: Blue-Bird, vol. 7, pp. 74–77, December.
Habits of two Florida Cranes in captivity.
1915. Two civilized Sandhill Cranes: Bird-Lore, vol. 17, pp. 246–247, 2 photographs, June.
Pet birds at Kissimmee, Fla.
WILSON, ALEXANDER
1808–1814. American Ornithology; or, the natural history of the birds of the United States. 9 vols.
Contains notes (vol. 7, p. 92) on Wilson's Petrel (under the name *Procellaria pelagica*) in Florida waters.
WILSON, THOMAS W.
1880. Forster's Tern in Florida: Amer. Nat., vol. 14, p. 738, October.
Reported common in winter in Volusia County.
WINTER, NEVIN O.
1918. Florida the land of enchantment. xii + 380 pp.
Contains a chapter on "The marvelous bird life" and many other references to birds.
WINTHROP, GILMAN JOSEPH
1897a. Migratory notes: Nidologist, vol. 4, p. 49, January.
Fall migration records at Tallahassee.

1897b. An insulted owl: Nidologist, vol. 4, p. 112, May.
Florida Screech Owl hatching a hen's egg.

WITHERBEE, MRS. F. B.

1929. Florida notes: Bird-Lore, vol. 31, p. 403, December.
Observations in winter at Pasadena.

WORCESTER, WEB

1895. A Quail hunt on horseback: Forest and Stream, vol. 44, p. 307, April 20.
Account of a hunt in "Southern Florida"; mentions killing a "Wild Pigeon."

WORTHINGTON, WILLIS WOODFORD, AND W. E. C. TODD

1926. The birds of the Choctawhatchee Bay region of Florida: Wilson Bul., vol. 38, pp. 204–229, December.
Fully annotated list of 160 species observed near Whitfield, Walton County, from November 15, 1902, to May 14, 1903.

WRIGHT, ALBERT HAZEN

1911. Other early records of the Passenger Pigeon: Auk, vol. 28, pp. 427–449, October.
Records of Wild Pigeons in Florida on pp. 437–438.

1912. Early records of the Carolina Paroquet: Auk, vol. 29, pp. 343–363, July.
Contains several Florida records.

1915. Early records of the Wild Turkey, IV: Auk, vol. 32, pp. 207–224, April.
Contains Florida records (pp. 211–213).

1926. The vertebrate life of Okefinokee Swamp in relation to the Atlantic Coastal Plain: Ecology, vol. 7, pp. 77–95, January.

WRIGHT, MABEL OSGOOD

1908. The Tree Swallow: Bird-Lore, vol. 10, pp. 179–182, August.
Contains account (by Mrs. Slosson) of destruction of large numbers of Tree Swallows by a cold wave at Miami, Fla., February 12, 1899.

WÜRDEMANN, GUSTAVUS

1861. [Letter relative to the obtaining of Flamingoes and other birds from south Florida]: Ann. Rept. Smiths. Inst. for 1860, (1861), pp. 426–430.
Account of capturing Flamingoes in summer, when they are moulting their flight feathers and are unable to fly.

WYMAN, JEFFRIES

1868. On a thread worm (*Filaria anhingae*) infesting the brain of the snake-bird (*Plotus anhinga* Linn.): Proc. Boston Soc. Nat. Hist., vol. 12, p. 100.
Contains notes on habits and food of the Water-Turkey, as observed on the St. Johns River.

1872. Note on the thread worm (*Filaria anhingae*) found in the brain of the Snake Bird: Amer. Nat., vol. 6, pp. 560–561, September.
Additional data obtained from 10 birds examined in Florida.

YORKE, F. HENRY

1899. Our ducks. 131 pp.

BIOGRAPHICAL REFERENCES TO CONTRIBUTORS TO FLORIDA ORNITHOLOGY

This list includes those persons who have written on Florida birds and concerning whom published biographical notices have been found; it does not include any persons now living. Following the names are references to the most complete biographies available.

ALLEN, CHARLES SLOVER (1855–1893):
Auk, vol. 11, pp. 86–87, 1894.

ALLEN, JOEL ASAPH (1838–1921):
Auk, vol. 39, pp. 1–14, 1922.

AUDUBON, JOHN JAMES (1785–1851):
Dict. Amer. Biogr., vol. 1, pp. 423–426, 1928.

BAILEY, HARRY BALCH (1853–1928):
Auk, vol. 46, pp. 155–160, 1929.

BAIRD, SPENCER FULLERTON (1823–1887):
Auk, vol. 5, pp. 1–14, 1888.

BARTON, BENJAMIN SMITH (1766–1815):
Dict. Amer. Biogr., vol. 2, pp. 17–18, 1929.

BARTRAM, JOHN (1699–1777):
Dict. Amer. Biogr., vol. 2, pp. 26–28, 1929.

BARTRAM, WILLIAM (1739–1823):
Cassinia, vol. 10, pp. 1–9, 1906; Dict. Amer. Biog., vol. 2, pp. 28–29, 1929.

BECKHAM, CHARLES WICKLIFFE (1856–1888):
Auk, vol. 5, pp. 445–446, 1888.

BOARDMAN, GEORGE AUGUSTUS (1818–1901):
Auk, vol. 18, pp. 219–220, 1901.

BONAPARTE, CHARLES LUCIEN (1803–1857):
Cassinia, vol. 9, pp. 1–5, 1905.

BOSC, LOUIS (1759–1828):
Alauda, vol. 2, no. 2, pp. 122–132, 1930.

BREWSTER, WILLIAM (1851–1919):
Auk, vol. 37, pp. 1–23, 1920.

BRYANT, HENRY (1820–1867):
Ann. Rept. Boston Soc. Nat. Hist., 1867, pp. 72–81.

BYRD, HIRAM (1874–1930):
Auk, vol. 48, p. 323, 1931.

BYRD, MRS. HIRAM (1873–1926):
Auk, vol. 44, pp. 162–163, 1927.

CAHOON, JOHN CYRUS (1863–1891):
Orn. and Ool., vol. 16, pp. 73–75, 1891.

CASSIN, JOHN (1813–1869):
Dict. Amer. Biogr., vol. 3, pp. 568–569, 1929.

CHILDS, JOHN LEWIS (1856–1921):
Oologist, vol. 38, pp. 102–106, 1921.

COOKE, WELLS WOODBRIDGE (1858–1916):
Auk, vol. 34, pp. 119–132, 1917.

COOPER, JAMES GRAHAM (1830–1902):
Proc. California Acad. Sci. (ser. 4), vol. 9, no. 3, pp. 69–121, 1919.

CORY, CHARLES BARNEY (1857–1921):
Auk, vol. 39, pp. 151–166, 1922.

COUES, ELLIOTT (1842–1899):
Auk, vol. 18, pp. 1–11, 1901.

CROSBY, MAUNSELL SCHIEFFELIN (1887–1931):
Auk, vol. 48, pp. 320–321, 1931.

DAWSON, WILLIAM LEON (1873–1928):
Auk, vol. 45, p. 417, 1928.

DUTCHER, WILLIAM (1846–1920):
Auk, vol. 38, pp. 501–513, 1921.

DWIGHT, JONATHAN, JR. (1858–1929):
Auk, vol. 47, pp. 1–6, 1930.

ELLIOT, DANIEL GIRAUD (1835–1915):
Auk, vol. 34, pp. 1–10, 1917.

FORBUSH, EDWARD HOWE (1858–1929):
Auk, vol. 47, pp. 137–146, 1930.

FUERTES, LOUIS AGASSIZ (1879–1927):
Auk, vol. 45, pp. 1–27, 1928.

GAMBEL, WILLIAM (1819?–1849):
Cassinia, vol. 14, pp. 1–8, 1910.

GIBBS, ROBERT MORRIS (1856–1908):
Auk, vol. 26, pp. 105–106, 1909.

GOSS, NATHANIEL STICKNEY (1826–1891):
Auk, vol. 8, pp. 245–247, 1891.

HALLOCK, CHARLES (1834–1917):
Nat. Cyclop. Amer. Biogr., vol. 9, pp. 506–507, 1907; Bul. Amer. Game Protec. Assoc., vol. 14, no. 1, pp. 11–12, 1925.

HARRIS, EDWARD (1799–1863):
Cassinia, vol. 6, pp. 1–5, 1902.

HEADE, MARTIN J. (1819–1904):
Forest and Stream, vol. 63, p. 233, Sept. 17, 1904.

HEERMANN, ADOLPHUS L. (1818?–1865):
Cassinia, vol. 11, pp. 1–6, 1907.

HEILPRIN, ANGELO (1853–1907):
Who's Who in Amer., 1903–1905, p. 675.
HENSHALL, JAMES ALEXANDER (1836–1925):
Who's Who in Amer., vol. 13, p. 1540, 1924–25; Autobiography, Forest and Stream, vol. 89, no. 5, p. 210, 1919, and following numbers.
HENSHAW, HENRY WETHERBEE (1850–1930):
Condor, vol. 21, pp. 102–107, and following numbers; Auk, vol. 47, pp. 600–601, 1930.
HOLDER, CHARLES FREDERICK (1851–1915):
Who's Who in Amer., 1914–1915, p. 1138.
HOLDER, JOSEPH BASSETT (1824–1888):
Auk, vol. 5, p. 220, 1888.
HOLLISTER, NED (1876–1924):
Auk, vol. 42, pp. 478–479, 1925.
HOYT, ROBERT DAY (1857–1918):
Auk, vol. 36, pp. 319–320, 1919.
JACKSON, THOMAS HOOPES (1848–1922):
Auk, vol. 39, pp. 299–300, 1922.
JENKS, JOHN WHIPPLE POTTER (1819–1894):
Auk, vol. 12, p. 94, 1895.
KOCH, AUGUST (1837–1907):
Auk, vol. 24, pp. 238–239, 1907.
KRIDER, JOHN (1813–1886):
Sportsman's Rev., vol. 29, p. 289, 1906; Cassinia, vol. 18, pp. 5–6, 1914.
LAWRENCE, GEORGE NEWBOLD (1806–1895):
Auk, vol. 12, pp. 1–10, 1895.
LAWRENCE, ROBERT HOE (1861–1897):
Auk, vol. 14, p. 342, 1897.
MAYER, ALFRED GOLDSBOROUGH (1868–1922):
Memoirs Nat. Acad. Sci., vol. 21, no. 8, pp. 1–14, 1926.
MAYNARD, CHARLES JOHNSON (1845–1929):
Bul. Boston Soc. Nat. Hist., no. 54, pp. 3–7, January, 1930.
MEARNS, EDGAR ALEXANDER (1856–1916):
Auk, vol. 35, pp. 1–18, 1918.
MUIR, JOHN (1838–1914):
Badé, W. F., The Life and Letters of John Muir, 1924.
NEHRLING, HENRY (1853–1929):
Auk, vol. 47, p. 133, 1930.
NUTTALL, THOMAS (1786–1859):
Memoirs Nuttall Orn. Club, no. 4, pp. 73–81, 1906.
OBER, FREDERICK ALBION (1849–1913):
Nat. Cyclop. Amer. Biogr., vol. 13, p. 311, 1906.
ORD, GEORGE (1781–1866):
Cassinia, vol. 12, pp. 1–8, 1908.
PALMER, WILLIAM (1856–1921):
Auk, vol. 39, pp. 305–321, 1922.
PEALE, TITIAN RAMSAY (1799–1885):
Cassinia, vol. 19, pp. 1–13, 1915.
PREBLE, GEORGE HENRY (1816–1885):
Nat. Cyclop. Amer. Biogr., vol. 8, p. 95, 1924.
RALPH, WILLIAM LE GRANGE (1851–1907):
Auk, vol. 24, pp. 461–462, 1907.
RIBAUT, JEAN (1520?–1565):
Connor, J. T., "Jean Ribaut," Florida State Hist. Soc., 1927.
RIDGWAY, ROBERT (1850–1929):
Condor, vol. 30, pp. 5–118, 1928.
ROBINSON, WIRT (1864–1929):
Auk, vol. 46, pp. 282–284, 1929.
ROOSEVELT, ROBERT BARNWELL (1829–1906):
Nat. Cyclop. Amer. Biogr., vol. 3, p. 415, 1893.
ROOSEVELT, THEODORE (1858–1919):
Theodore Roosevelt, an Autobiography, 615 pp., 1914.
RYMAN, J. J. (1854?–1918):
Oologist, vol. 36, p. 6, 1919.
SAFFORD, WILLIAM EDWIN (1859–1926):
Amer. Botanist, vol. 32, pp. 63–66, 1926.
SAY, THOMAS (1787–1834):
Weiss and Ziegler, "Thomas Say," 1931.
SCOTT, WILLIAM EARLE DODGE (1852–1910):
The Story of a Bird Lover, 1903; Auk, vol. 27, pp. 486–488, 1910.
SHARP, DALLAS LORE (1870–1929):
Who's Who in Amer., 1926–1927, p. 1720.
SHORES, ERWIN I. (1856?–1906):
Wilson Bul., vol. 29, pp. 1–17, 1917.
STEARNS, ROBERT EDWARDS CARTER (1827–1909):
Smiths. Misc. Coll., vol. 56, no. 18, 1911.
TAYLOR, GEORGE CAVENDISH (1826–1889):
Ibis, 1890, pp. 265–266; Jubilee Suppl., 1909, pp. 209–210.
THOMPSON, MAURICE (1844–1901):
Internat. Year Book, 1901, p. 761.
TORREY, BRADFORD (1843–1912):
Auk, vol. 30, pp. 157–159, 1913.
WAYNE, ARTHUR TREZEVANT (1863–1930):
Auk, vol. 48, pp. 1–16, 1931.
WHITEHEAD, CHARLES EDWARD (1829–1903):
Forest and Stream, vol. 60, pp. 241, 242, March 28, 1903.
WILSON, ALEXANDER (1766–1813):
Wilson Bul., vol. 20, no. 1, pp. 3–18, 1908, and following numbers.
WÜRDEMANN, GUSTAVUS (?–1859):
Ann. Rept. Smiths. Inst. for 1859 (1860), p. 114.
WYMAN, JEFFRIES (1814–1874):
Nat. Cyclop. Amer. Biogr., vol. 2, pp. 254–255, 1921.

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