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**CROSSING THE ISTHMUS: OVERLAND SPRING
MIGRATION OF COMMON LOONS (*GAVIA IMMER*) IN
ALACHUA COUNTY, FLORIDA**

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In North America, the Common Loon (*Gavia immer*) breeds on lakes across Canada and the northern United States and winters in large numbers on the coastlines of the United States, with smaller populations wintering on large lakes and reservoirs of the interior (McIntyre and Barr 1997, AOU 1998). In the spring, the coastal wintering populations stage extensive migrations along both the Pacific and Atlantic coastlines, when large flights can be seen from coastal bird-watching sites (Winter and Morlan 1977, McIntyre and Barr 1997). Springtime migration paths of birds wintering in the interior, including those on the Gulf of Mexico, are not nearly as well known, but some of these birds would, by necessity, fly overland. Loons probably prefer to fly over water more than over land because they need large expanses of open water to rest and feed.

Substantial populations of loons winter in Florida, along coasts of both the Atlantic Ocean and the Gulf of Mexico (Clapp et al. 1982, Alexander 1985, Jodice 1993). In the spring, some northbound migrants from populations wintering on the Atlantic coast of Florida undoubtedly become part of the large numbers of loons that pass off the coast farther north (Powers and Cherry 1983), although some birds may head from wintering areas directly overland to breeding areas in the north-central U.S., thus reversing their fall migration routes (Kenow et al. 2002). Populations along the western Panhandle of Florida would presumably fly straight north in spring, reversing their fall flight path (Kenow et al. 2002). Populations along peninsular Florida's Gulf of Mexico coast, however, can follow two possible routes: they either can cross the Peninsula to join the northbound Atlantic populations, or fly north to the northern Gulf of Mexico and then overland to breeding sites in the north. The latter course would incur much more overland flight, but the former course may be less direct.

In the center of the northern peninsula of Florida (Alachua County), small numbers of Common Loons have been observed flying overhead on spring mornings in late March and April, where the spe-

cies is otherwise rare (Rowan and Manetz 2006; see also Williams 1973). To document and quantify the spring migration of Common Loons over Alachua Co., I conducted systematic sky watches from mid-March to mid-April, 2003-2006. Data on direction and timing were then used to assess the provenance and proximate destination of these loons.

METHODS

In 2003, I began observing loon migration in southeast Gainesville, Alachua Co. (29°38'N, 82°19'W). I spent morning hours scanning the sky, watching for loons flying overhead, from either my backyard at 1201 SE 24th Avenue, Gainesville, or along the Gainesville-Hawthorne recreation trail, south of SE 22nd Avenue. In 2004, I also began observing loons from the eastern edge of Pine Grove Cemetery, off SE 22nd Avenue, adjacent to the other sites. This site has far views of the western and northern horizons, and a somewhat diminished view of the southern horizon. This location allowed for long views of the flying loons, and most loons passing within a ca. 1500 m north-south corridor were visible. For loons that passed directly overhead, I had views for ca. 30 secs. Migrating loons to the north could be detected as far as at ca. 1000 m; to the south loons needed to be within ca. 500 m to be seen. In 2005-2006, I watched loon migration primarily from Pine Grove Cemetery. During the first two years, I recorded only a daily tally of migrating loons. In 2005-2006 I recorded time of each observation, direction of movement, and size of each group. I used 10 × 42 mm binoculars for all observations.

To associate loon migration with weather conditions, I used weather data from the website of the Jacksonville office of the National Weather Service (<http://www.srh.noaa.gov/jax/climate.shtml>).

RESULTS

All but one of the observed loons migrating across Alachua County were Common Loons. On 31 March 2004, a lone Red-throated Loon (*G. stellata*), in basic or juvenal plumage, was observed flying with 12 Common Loons; this exceptional record is not included in the following analyses. There are only two previous records in Alachua Co. (Rowan and Manetz 2006) of the Red-throated Loon, which is rare along Peninsular Florida's Gulf of Mexico (Stevenson and Anderson 1994).

The total number of loons recorded from 2003-2006 was 712 (Table 1). In 2003, a total of 63 loons was observed migrating on nine days from 21 March through 17 April. In 2004, a total of 102 loons was observed on nine days from 18 March through 14 April. In 2005, a total of 78 loons was observed (0.13/hour) on 10 days from 29 March through 8 April. In 2006, with refined methodology, more complete coverage, and a better knowledge of timing, a total of 470 loons was observed (0.59/hour) during 21 mornings from 16 March through 13 April.

Over the entire period of observation, the largest single day count was 193 loons on 4 April 2006; this one day accounts for 27% of all loons seen over the four years. The second largest count was 117 loons on the

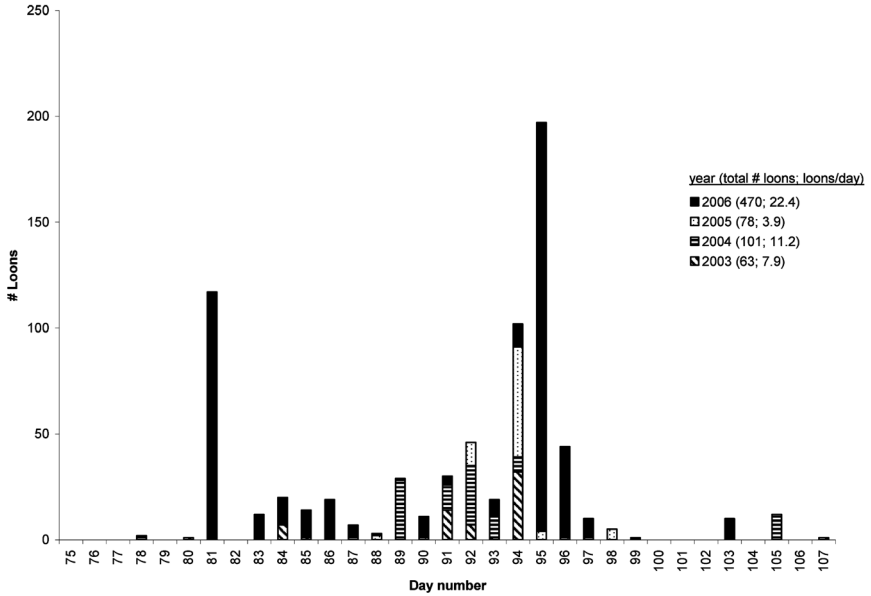


Figure 1. Daily count of Common Loons migrating over Gainesville. Day number 91 corresponds to 1 April in all years except 2004, when 1 April is day number 92.

rather early date of 22 March 2006. Aside from this count, the total number of loons seen prior to 25 March during the four years is only 15. Partitioning the data into five-day periods, the interval of 2-6 April was the most active, with 408 loons or 57% of the total.

Of the 535 loons recorded in 2005-2006, 85% passed over between 75-105 minutes after sunrise (Fig. 2); the most active five-minute period was from 85-90 minutes after sunrise, accounting for 11% of the total. However, the rate was highest in 5-minute period from 90-95 minutes after sunrise (1.0 loons/minute). The earliest recorded was a flock of three 58 minutes after sunrise on 7 April. The latest recorded were two that passed 195 minutes after sunrise on 4 April 2005.

The size of the flocks was recorded only in 2006. The largest flock was 37 birds (on 4 April 2006). The average flock size was 5.4 loons. Of the 85 independent sightings, 35 consisted of one loon.

Of the 467 loons recorded in 2006, all but two groups were heading between east and northeast, with 90% moving between east-northeast and northeast. The exceptions were two loons heading north on 4 April 2006, and one loon heading southeast on 9 April 2006.

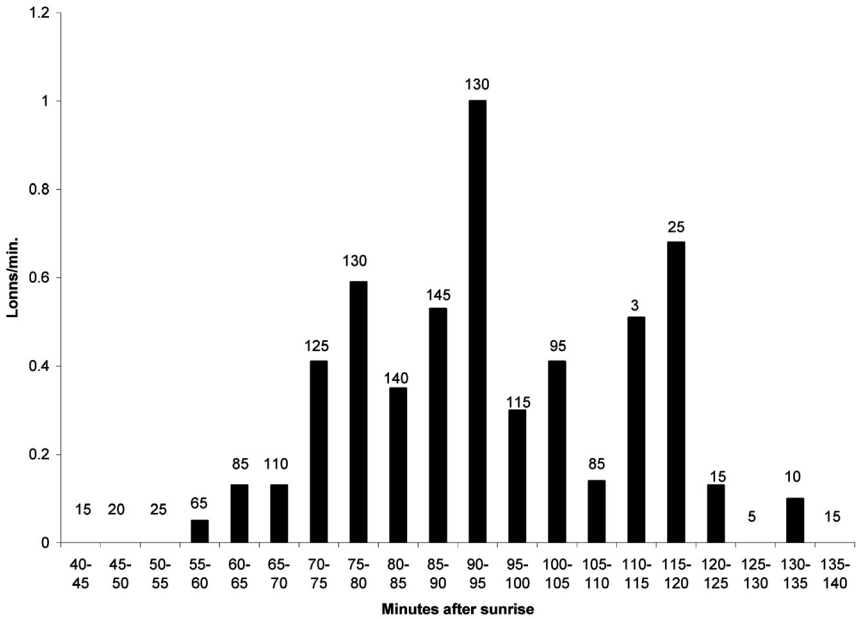


Figure 2. Migration of loons at five-minute intervals in 2004-2005. Number over bar is the total minutes surveyed in that period over both years.

Weather conditions associated with large (>40) numbers of loons migrating over Gainesville were clear or foggy mornings with slightly cooler (than normal) to cold days following cold fronts. The morning of the largest passing of loons (193 on 5 April 2006) was foggy, with the low temperature 3°C below the mean normal low temperature for that date. A cold front had passed on 3-4 April. The following morning (6 April), which had the fourth largest count (43 loons), also was cool (3°F below normal). The second largest passing (117 loons on 22 March 2006) was on a foggy and slightly cool morning (1°F below normal) following a cold front on 21 March. Winds were from the north on both 5 April and 22 March 2006, but not on 6 April, when they were from the southwest. The third largest passing (52 on 4 April 2005) was on a clear, cool morning (4°F below normal) following a cold front that had passed on 1-2 April; the winds were from the northwest on 3 April, but from the east on 4 April.

DISCUSSION

The timing (peak at ca. 90 min after sunrise) and direction of movement (almost exclusively between east-northeast and northeast) of

loons observed migrating over Gainesville, along with known flight speeds of migrating loons (108 km/hr; Kerlinger 1982) and the geography of the Florida peninsula (Fig. 3), strongly suggests that these birds originate the same morning from the Gulf of Mexico near Cedar Key (88 km SW of Gainesville), leaving, on average about 0.7 hr. after sunrise. The loons then pass over Gainesville ca. 50 min later, most likely continuing northeast until they reach the Atlantic Coast in northern St. Johns Co. at ca. 1.8 hours after sunrise (Fig. 3). This flight would entail a 196-km overland route to cross the Florida peninsula. The loons then could follow traditional migratory routes northward along the Atlantic coast toward their breeding areas (Powers and Cherry 1983).

Their flight, over a narrow isthmus of north-central Florida, would have loons that winter off peninsular Florida's west coast using one of the shortest possible routes to avoid flying overland (Fig. 3) while maintaining a northward component in spring migration. By starting at Cedar Key, the loons cross the peninsula where it is narrow, whereas both north and south of Cedar Key the coast begins to bulge westward, away from the Atlantic (Fig. 3). Nevertheless, there are shorter routes in the vicinity; one (172 km) would start 28 km east-southeast of Cedar Key and trend east-northeast to central Flagler County; the other (168 km) would start in central Citrus County and trend east-northeast to northern Volusia Co. These routes would miss Alachua County altogether: the loons would pass about 40 km and 60 km south of my observation sites. Therefore, minimization of overland flight distance may not be the sole criterion for route selection. The vicinity of Cedar Key is known for having sizable wintering populations of Common Loons (Jodice 1993, CBC data); this area may thus provide a better stopover foraging site for loons migrating north than areas with starting points to the east and south. This concept could be evaluated by conducting springtime loon counts in Marion County at localities ca. 40 and 60 km south of my study site.

For birds that winter from Charlotte Harbor south an equally short path with a northward component trends from Charlotte Harbor northeast toward southernmost Brevard Co. There is no empirical evidence, however, that loons use these alternative routes.

The results presented here suggest that a sizable population of Common Loons winters on the eastern Gulf of Mexico from Cedar Key south, although these populations may be smaller than those in the Panhandle (Clapp 1982, Stevenson and Anderson 1994, P. Jodice, in litt.). Nevertheless, large numbers have been reported locally on the Gulf coast of peninsular Florida. Following an oil spill in Tampa Bay, 500 loons were cleaned in 1970 (Clapp et al. 1982). From 1990 to 2004, the number of loons observed on 21 Christmas Counts on the Gulf

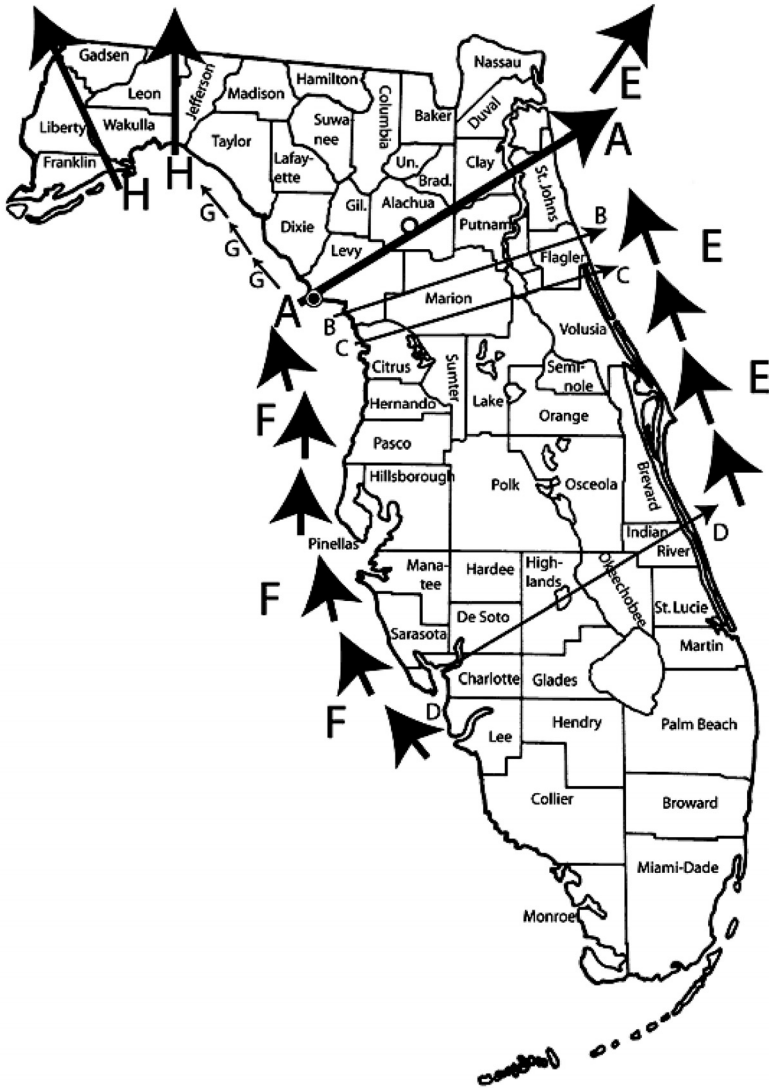


Figure 3. Spring migration routes of loons in Florida. Bold arrows: probable routes; non-bold arrows: routes with no empirical data. A: overland route crossing peninsular Florida over Alachua County. B, C, D: overland routes shorter than A across peninsular Florida, but no empirical evidence for use. E: overwater routes north along Atlantic coast. F: overwater route north along southern Gulf coast of peninsular Florida. G: overwater route from Cedar Key to Big Bend, no empirical evidence for use. H: overland routes from Big Bend area directly north to breeding areas. ○ Cedar Key (Levy County); ● Gainesville (Alachua County).

Coast from Cedar Key south to the Everglades (National Audubon Society website: <http://www.audubon.org/bird/cbc/hr/>) averaged 269 individuals/year, with the high annual count of 549 individuals in 1991. The largest number of Common Loons recorded on a Christmas Count in peninsular Florida was 446 on the Cedar Key Count in 1991. Some additional loons winter on inland lakes on the peninsula, most notably on Lake Weir in Marion County (80 km SSE of Gainesville), where up to 96 individuals have been recorded on the Emeralda Christmas Count (E. Scales, pers. comm.). It seems unlikely that these loons would pass over Gainesville during spring migration with a northeasterly trajectory. Although the flight corridor used over Gainesville appears to be quite narrow, I am clearly counting only a portion of the loons flying along this route. What must have been different individuals were observed on the same mornings as my observations in northeast Gainesville, 4.8 km north of my site (R. Rowan, pers. comm.).

Although distant overland flights are undoubtedly used by some migrating Common Loons (e.g., the large population that winters off Florida's Panhandle on the Gulf of Mexico), overwater flights are probably preferred if available, especially if they have similar costs of timing and fuel. Overland flight for migrating loons probably has higher risks than overwater flight, because loons depend on water if they are grounded by poor flight conditions or sunset. Other options for migration paths for loons wintering on the Gulf Coast of peninsular Florida would include much longer overland flights (straight NNE to NNW to breeding areas in northern United States and Canada), marginally shorter (180 km) overland flights but in an unfavorable direction (straight east across the Florida Peninsula to the Atlantic), or a much longer and more circuitous overwater flight (around Cape Sable in southern Florida, then northward along the Atlantic coast).

A similar movement may occur during fall migration; however, the only such record I found involving cross-peninsula migrants was 20 flying south-southwest over Paynes Prairie in Alachua County on 14 November 1976 (J. Hintermister, cited in Stevenson and Anderson 1994).

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