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# Confirming Fall Migration Routes for South Carolina Ruby-throated Hummingbirds, *Archilochus colubris*

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## ABSTRACT

*Foreign encounters with four Ruby-throated Hummingbirds (RTHU), Archilochus colubris, banded and color-marked at Hilton Pond Center for Piedmont Natural History near York, SC, provide the first conclusive evidence that some RTHU that breed or fledge east of the Appalachians migrate in autumn across the southern US—rather than due south to Florida—before taking a trans-Gulf or overland route into Mexico and Central America for the non-breeding months.*

## INTRODUCTION

Ruby-throated Hummingbirds (RTHU), *Archilochus colubris*, breed in the eastern half of the United States and in southern Canada as far west as Alberta (Sauer et al. 2005). With such a broad distribution, RTHU are likely the most common of the 339 hummingbird species, but ornithologists know relatively few specifics about RTHU migration.

In autumn, nearly all adult RTHU and young-of-the-year migrate from North America into Mexico or any of the seven Central American countries (Robinson et al. 1996). A very small percentage of RTHU overwinter in Gulf Coast states, the coastal plain of the Carolinas, and—even more rarely—at inland sites (*vide* Audubon Christmas Bird Counts). Anecdotal reports from oil platforms and boats confirm a trans-Gulf of Mexico autumn crossing for at least some RTHU (V. Remsen, pers. comm.),

with many departing the Texas coast in mid- or late-September (pers. observation at Rockport). Other RTHU may migrate overland through eastern Mexico.

At public presentations, I frequently hear lay people say that they believe RTHU that breed or fledge in states along or east of the Appalachian Mountains migrate south to Florida in autumn before making a non-stop trip across the Gulf to Mexico's Yucatan Peninsula. Florida points southward—the general direction of the Yucatan—which may lead to such conjecture. This viewpoint is also sometimes found in text or on maps in popular literature (e.g., Stokes and Stokes 2002). RTHU do fly across the Gulf, but Johnsgard (1997) calls reports of a Florida departure “speculative.” I could find no published scientific accounts of Florida-to-Yucatan RTHU migration in autumn, although concentrations of RTHU in the Florida Keys/Dry Tortugas indicate that this path may be taken in spring (K. Markey, pers. comm.). Herein I describe how encounters with four banded and color-marked RTHU from Hilton Pond Center for Piedmont Natural History near York, SC, provide the first conclusive evidence that some East Coast RTHU take a migratory route across the southern US.

**Field-Site Description** - I banded 2,614 RTHU at Hilton Pond Center from 1984 through 2007, capturing them in mist nets and traps. The study site (34°58' 21.36"N, 81°13' 24.13"W) is a 5.5-ha (14.8-ac) tract in the heart of the South Carolina Piedmont physiographic province, about halfway between the southern Blue Ridge Mountains and the Atlantic coast. The property was in agricultural use (row crops and cattle grazing) for at least 65 years—and possibly for a century or more—prior to 1982. Since that date, natural vegetational succession has converted a mostly open expanse into a young woodland of pines and hardwoods



surrounding a 0.5-ha pond. Several small clearings dot the property, including those around an old farmhouse (circa 1918) that serves as the Center's office and main hummingbird feeding area. The primary local hummingbird nectar plant is native trumpet creeper (*Campsis radicans*), of which there are numerous thickets and mature tree-climbing vines. Few other nectar plants occur on the property, but I maintain a dozen or more artificial feeders year-round, each containing a 4:1 water:sugar mix.

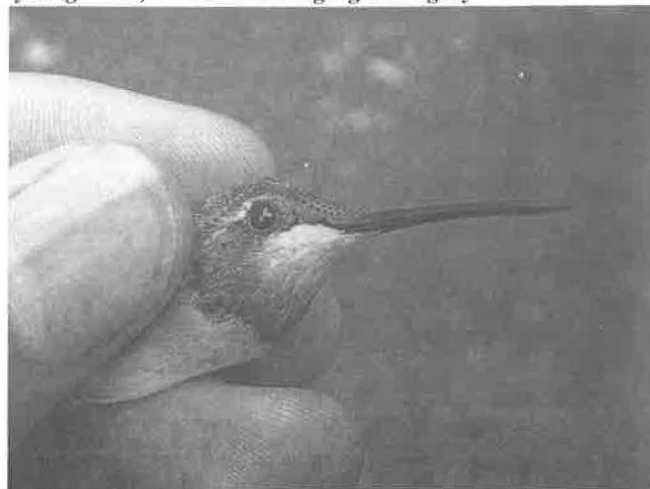
## METHODS

From dawn until dusk on most days in late March through mid-October (weather permitting), I unfurl six four-shelf 25-mm hummingbird mesh nets 12 m long by 2.5 m tall near sugar water feeders at the Hilton Pond farmhouse, although I do capture a few RTHU incidentally in 30-mm and 36-mm mesh nets away from my main feeding stations. I catch about a quarter of my RTHU each year in nets. I also use six-to-eight operator-activated wire mesh traps I monitor periodically when RTHU are present. I outfit the typical trap—baited with a hummingbird feeder—with a sliding or swinging door that closes when I pull a string; some traps I trigger remotely with radio-controlled devices. All captured RTHU receive a standard numbered aluminum band provided by the US Bird Banding Laboratory (BBL). I always band male RTHU on the left leg, females on the right. I can sex even young RTHU with 100% accuracy because, in this species, the sixth primary feather is tapered and pointed in males while the tip is more or less rounded in females (Leberman 1972).

After banding, Hilton Pond RTHU—especially summer residents—frequently enter the same traps several times per day. To avoid multiple re-traps, I color-mark each bird with green dye on the throat and/or upper breast to make it easier to see it is already banded and does not require trapping (Fig. 1). Under permissions granted by the BBL, only RTHU banded at Hilton Pond may be marked in this way. I apply the green dye with a Sharpie or similar “permanent” felt-tip marker, carefully blotting excess ink with absorbent tissue paper. The

mark lasts four to eight weeks before it fades or disappears from moisture and/or preening, requiring that I recapture and re-mark most resident Hilton Pond RTHU one or more times during the breeding season. Because RTHU return in spring migration with new plumage I must re-mark recaptures from previous years at that time (Hilton and Miller 2003).

Fig. 1. All Ruby-throated Hummingbirds captured and banded at Hilton Pond Center for Piedmont Natural History, York, SC, also receive a bright green color mark on the upper breast. The mark is especially visible on females (below) and similar-looking young males, but the metallic gorget and gray flanks on an adult



Color-marking RTHU at Hilton Pond has the added benefit of making my banded hummingbirds more noticeable to observers away from the banding site. In fact, it was primarily because of green dye that observers reported RTHU from Hilton Pond at four distant locations described below.

## RESULTS

**Location 1.** Hilton Pond Center lies almost due north of the Florida peninsula. The first indication my locally banded RTHU from the Center were not migrating south to Florida before crossing the Gulf of Mexico came in the fall of 1991, when Gina Pearson in the Atlanta, GA, suburb of Loganville, observed a hummingbird with a green throat at her feeder. Pearson contacted Bob Sargent, a hummingbird bander from Alabama, who drove to Loganville and captured the bird in question on 6 Oct. Upon discovering it was a color-marked RTHU, Sargent reported the band number (7000-54512) to



the BBL, which informed him that it had issued the band to Hilton Pond. I subsequently determined I had banded this RTHU as a hatch-year male on 26 Sep at Hilton Pond, 435 km northeast of Loganville—just ten days before Sargent's encounter (Table 1).

**Table 1. Four Ruby-throated Hummingbirds banded at Hilton Pond Center for Piedmont Natural History, York, SC, and encountered at distant locations.**

Band No.	Age/Sex <sup>1</sup>	Banding Date	Encounter Date	Encounter Location	Distance
7000-54512	HY/M	26 Sep 1991	06 Oct 1991	Loganville, GA	435 km
?	?/F	?	21 Sep 1997	Cameron, LA	1270 km
8000-86632	HY/F	03 Oct 2000	20 Oct 2000	Robertsdale, AL	780 km
3000-16012	HY/M	17 Sep 2006	01 Oct 2006	Thomaston, AL	670 km

<sup>1</sup> HY = Hatch-year; M = male; F = female

Although US and Canadian banders had banded approximately 150,000 RTHU up to that time (*vide* BBL records), this particular RTHU was the first of its species ever encountered more than 16 km from its banding site. Its migratory path appeared to be southwesterly rather than due south toward Florida (Fig. 2).

**Fig. 2. Flight directions and encounter sites of four Ruby-throated Hummingbirds (RTHU) banded at Hilton Pond Center for Piedmont Natural History, York, SC. All four birds appeared at locations southwest of York, contrary to a common layperson belief that all RTHUs from the eastern US fly south to Florida before migrating across the Gulf of Mexico to the Yucatan Peninsula.**





**Location 2.** Bander Fred Bassett learned of a green color-marked RTHU in the Mobile, AL, suburb of Robertsdale, in 2000. Bassett retrapped the bird on 20 Oct and—after reporting the number (8000-86632) to me—learned I had banded this RTHU as a hatch-year female 17 days earlier on 3 Oct at Hilton Pond. This bird flew at least 780 km from the banding site, again in a southwesterly direction.

**Location 3.** On 1 Oct 2006, Parrish Pugh found a dead color-marked RTHU beneath his sugar water feeder at Thomaston, AL, and reported the band number (3000-16012) to the BBL via its Web site submission page. My records showed I had banded this bird as a hatch-year male 15 days earlier on 17 Sep at Hilton Pond, about 670 km to the northeast.

**Location 4.** The fourth encounter was by Judy Fruge, who, on 21 Sep 1997, saw a green color-marked RTHU at her feeder at Cameron, LA—on the Gulf Coast near the Louisiana-Texas border. Fruge knew of the Hilton Pond color-marking protocol and contacted me via e-mail. She was not authorized by the BBL to recapture the marked RTHU but did carefully observe that it was banded on the right leg. Thus, even though she did not read the band number for this particular RTHU, I knew it was from Hilton Pond because of green dye on the breast, and that it was a female because the right leg was banded. This encounter was 1270 km southwest of Hilton Pond, the furthest known sighting of a color-marked RTHU away from its banding site—and a long way west of Florida.

## DISCUSSION

The four Ruby-throated Hummingbird encounters from Hilton Pond are significant in themselves because the BBL had received few reports of RTHU away from their banding sites. Thus, even a small sample size of four birds is significant.

These birds provide new insights into RTHU migration routes. Because Florida points southward and is relatively close to the Yucatan Peninsula, it is reasonable to assume RTHU from the eastern US could fly to south Florida before migrating across

the Gulf of Mexico and dispersing to their non-breeding grounds in Mexico and Central America. However, two foreign recaptures, one foreign recovery, and one distant sighting of color-marked RTHU from Hilton Pond in north central South Carolina provide conclusive evidence that at least some RTHU originating from or passing through Hilton Pond are moving in southwesterly directions—not south toward Florida.

I cannot discern exactly how long it took these four birds to cover distances from Hilton Pond to their encounter locales, but it seems unlikely any made their trips in just a few days. At banding, none of the three recaptured or recovered RTHU—all hatch-year birds—had put on extra fat. They weighed about the same as typical summer birds (3.10 g, 3.37 g and 3.25 g, respectively), so they undoubtedly needed time to feed along their routes to replace lost energy.

Various sources (e.g., Austin 1975) estimate RTHU migration over land at about 36 km per day. When I calculated possible travel time for my three RTHU recaptured or found dead 10, 15, and 17 days after banding, I determined they would have averaged at least 43.5, 44.7, and 45.9 km/day respectively—about 17-20% faster than Austin predicted.

I also do not know where any of the three surviving RTHU from Hilton Pond went after their encounters in Georgia, Alabama, and Louisiana. I speculate that they headed toward the Texas Gulf Coast, where hundreds of thousands of RTHU assemble each autumn, apparently prior to flying across the Gulf of Mexico in a southeasterly direction toward the Yucatan or another part of the Mexican shore. (Indeed, the coastal towns of Rockport and Fulton, TX, hold an annual festival that revolves around the large number of migrant RTHU staging from there.) It is possible that some RTHU from Hilton Pond and the rest of the eastern US actually cross the Gulf from other points along the coast—e.g., Mobile or New Orleans—perhaps basing the departure point on weather conditions. Other RTHU may fly overland along the Mexican coastline before dispersing into Central America. However, based



on my results and despite popular belief, I suspect that relatively few, if any, RTHU actually depart from Florida in fall migration.

As of the time this paper was written, no other Carolinas researchers have had migrant RTHU encountered elsewhere (*fide* Bird Banding Laboratory). Because of the proprietary nature of banding data, I encourage hummingbird banders in other parts of the country to publish their encounter results to help improve understanding of RTHU migration.

### ACKNOWLEDGMENTS

I thank Gina Pearson, Parrish Pugh, and Judy Fruge for their initiative in reporting encounters with color-marked RTHU from Hilton Pond, and banders Bob Sargent and Fred Bassett for successful efforts to recapture two of the birds and contact me with results. I acknowledge the U.S. Bird Banding Laboratory—especially the late Kathy Klimkiewicz and Mary Gustafson—for patience, guidance, and on-going support of banding efforts at Hilton Pond. I appreciate suggestions from several reviewers, some anonymous, for early and final drafts of this paper. My research leading to this publication was funded in part by the National Fish and Wildlife Foundation and the PhillipsConoco Bird Conservation Fund, Agilent Technologies, The Christensen Fund, Susan B. Hilton, Gordon Dressler Jr., Norma D. Ballard, the late Robert S. Ballard, and numerous other individuals who made thoughtful donations.

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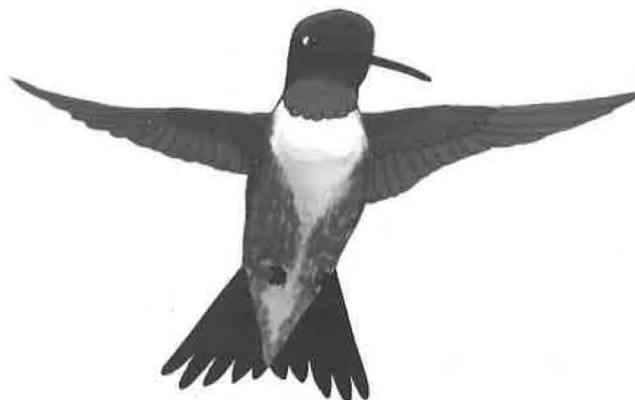
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