Florida Field Naturalist 26(4),117-121, 1998.

SECOND BREEDING LOCALITY OF CLIFF SWALLOWS IN FLORIDA

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Cliff Swallows (*Petrochelidon pyrrhonota*) have bred at one locality in Florida, near Port Mayaca, Martin County, where less than ten pairs nested under bridges at 1-2 sites from at least 1975 to 1982 (Sykes 1976, 1979; Robertson and Woolfenden 1992, Stevenson and Anderson 1994). This extralimital breeding locality on the east side of Lake Okeechobee was 690 km away from another former extralimital breeding site on the Atlantic coast of South Carolina in Charleston County, which was active from 1977-1981 (Shuler 1978, Post and Gauthreaux 1989).

Along the Gulf coast, an active breeding colony of Cliff Swallows is located at Mobile Bay, Alabama, 50 km west of the Florida line. This colony was discovered in 1982 when 22 pairs nested; an estimate of current numbers is 20-30 pairs (Reid 1988, Summerour 1989, G. Jackson *in litt.*). Other coastal colonies along the Gulf are located farther west in Mississippi and beyond (Spence and Toups 1986, Imhof 1989:494; see Brown and Brown 1995).

Inland breeding populations of Cliff Swallows have expanded south from northern Alabama and Georgia but still have not penetrated beyond the Piedmont into the Upper Coastal Plain (Grant and Quay 1977, Haney et al. 1986, Phillips 1986, Reid 1988, Summerour 1989, Brown and Brown 1995), except for one small colony site in Perry County, Alabama, which was colonized in the early 1990s (G. Jackson *in litt.*). In nearby Tuscaloosa County, other colony sites were active in 1975-1976 (C. R. Brown *in litt.*, B. Summerour *in litt.*) and from the early 1990s to the present (G. Jackson *in litt.*). We are uncertain if these colony sites are located in the Upper Coastal Plain rather than the Appalachian Mountain physiographic province. A sizable gap still exists between the inland and Gulf coastal breeding populations of Cliff Swallows in the southeastern United States (see Brown and Brown 1995).

We document the second breeding locality of Cliff Swallows in Florida at St. Vincent Island, Franklin County, in 1997 and 1998. This site is on the Gulf coast, 285 km east-southeast of the Mobile Bay colony. The nest site was the wooden refuge boathouse along St. Vincent Sound near Indian Pass, 400 m from the mainland. A small colony of Barn Swallows (*Hirundo rustica*) nests annually at the site.

We monitored the Cliff Swallow colony at least twice a week throughout the breeding season of 1997. The first birds (Pair 1) arrived and began nest building on 10-11 May. We saw a third individual on 27 May, but did not observe Pair 2 until 13 June, when they began nest building. We first observed Pair 3 on 17 June when they also began building a nest.

Each pair built at least one nest. Pair 1 attempted to build a nest attached to the soffit and painted wooden vertical siding of the boathouse. Nest material repeatedly fell off and the nest finally collapsed on 18 May. The birds then selected a nest-site on the opposite side of the boathouse on the ledge of a support pole and adjacent siding just below the soffit. This nest was built on the remains of an old Barn Swallow nest and also collapsed before egg-laying began. Following this second failure, Pair 1 was joined by two other pairs. All three pairs built nests on top of boathouse support poles, Pair 1 on the

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same pole as their second nest, and the two new pairs on adjacent poles. One of these latter nests was built on the remains of an old Barn Swallow nest. All Cliff Swallow nests were ca. 3.5 m above the water.

Initially, all three pairs collected nest material from the beach within 20 m of the boathouse. Nest material routinely fell off shortly after it was applied to the substrate or the nest. The third nest attempt of Pair 1 and the nests of Pairs 2 and 3 did not remain intact until birds collected a more adhesive material from a tidal pool on the Gulf beach, 600 m away from the boathouse.

We analyzed soil samples obtained from both locations (USDA touch texture method performed by J. Schuster). The sample from the boathouse beach had a texture of fine sand, Munsell soil color 10YR 8/2. The combined percentage of clay and silt was less than 5% and organic matter was extremely low. The tidal pool sample had a texture of fine sand loam, Munsell soil color of 2.5Y 5/2. Color and odor suggested high organic content, but this negated precise analysis of clay and silt content, which probably ranged from 30-50%. The soil samples from the tidal pool location had much higher clay, silt, and organic content and were much more adhesive than the fine sand from the boathouse beach location, which rarely stayed intact even when wet (cf., Robidoux and Cyr 1989).

None of the Cliff Swallow nests were normal, closed, retort-shaped structures, which suggests that material collected from the tidal pool was barely adequate for nest-building. The partially completed neck of one nest crumbled. Only a half-dome covered the top of the remaining nests which had even more exposed entrances. Cliff Swallows spent considerable time repairing the three active nests. The third nest of Pair 1 collapsed on 27 June, after incubation had begun, and the pair was not seen again.

All three pairs commenced incubating the latter half of June in incomplete nests, which is not unusual (Samuel 1971). Pair 2 fed young on 8 July; the last of 2-3 young fledged on 25 July. We observed three eggs on 3 July in the nest of Pair 3; the pair were feeding young on 15 July. These young fledged between 29 July and 1 August. We saw the last Cliff Swallows (two) flying in the vicinity of the boathouse on 12 August. The nests of Pairs 2 and 3 collapsed about a week later.

We captured a juvenile Cliff Swallow of Pair 2 at 0830 hr on 25 July, after it had just fledged (Fig. 1; TTRS P644). This is the first juvenile Cliff Swallow banded in Florida. Its mass was 22.2 g and had no visible fat. Other data were: wing length (flattened/chord): 93/91.5 mm; tail length (central rectrices): 43.5 mm; bill length (base of forehead/anterior edge of nostril): 7.35/5.4 mm, and tarsus: 13.15 mm. The juvenile was in molt. Primaries 6-9 and the rectrices were still growing and partially sheathed at the base. Otherwise, the remiges were completely grown. The upper- and undertail coverts were also partially sheathed at the base. The remainder of body molt was fairly heavy, especially on the forehead, chin, and throat. Many feathers from each of these three areas had broad white tips, whereas the base was dark, varying from rusty to reddish-brown (Fig. 1). We detected no ectoparasites.

In 1998 two pairs of Cliff Swallows nested at the exact sites where Cliff Swallows nested successfully in 1997 (Pairs 2 and 3). In 1998, we saw the first Cliff Swallow on 22 May; its mate, a dark-forehead bird as in 1997 (possibly the same individual), arrived on 27 May. We noted a second pair on 9 June. Both Cliff Swallow pairs evicted incubating and brooding Barn Swallows from their nests (see Brown and Brown 1995) on 4 and 13 June. Pair 1 of 1998 had completed three-quarters of its nest by 17 June. Pair 2 of 1998 never built a nest, but attempted to evict the other pair of Cliff Swallows from their nest. We conclude that intraspecific aggression, which continued through 24 June as the nest deteriorated, was the cause of breeding failure. We did not see Cliff Swallows at the nest afterwards, although we saw foraging individuals in the vicinity through 28 July.

Breeding at this small Cliff Swallow colony was delayed in 1997 because several nests collapsed because of the poor quality of available nesting materials. Despite the usurpation of Barn Swallow nests in 1998, the poor quality of nesting materials may also have

Figure 1. Cliff Swallow, St. Vincent Island, Franklin Co., Florida, 25 July 1997. This juvenile is the first banded in Florida. Note the molt on the forehead, chin, and throat (see text). Photo by T. E. Lewis.

been responsible for the delayed breeding attempt at one nest that year. These pioneering Cliff Swallows may also have arrived late (mid-May to early June) in both years. Cliff Swallows typically arrive at their breeding colonies in the southeastern United States in late April (Grant and Quay 1977, Post and Gauthreaux 1989, Brown and Brown 1995). However, delayed breeding because of late arrival is uncertain in the extreme southeastern United States because of the scarcity of data. An extralimital pair of Cliff Swallows in their first breeding year in coastal South Carolina probably nested late in 1977 (Shuler 1978). In the subsequent year, a single pair reused the old nest and probably did not breed late (Shuler 1978). Sykes (1976) did not document late breeding at the extralimital Cliff Swallow colony in southeast Florida in 1975, although this Martin County breeding colony had established itself by 1974 or earlier.

Both extralimital Cliff Swallow colonies established in the mid-1970s in southeast Florida and South Carolina did not persist, although both colonies fledged some young. Most active nests in South Carolina and southeast Florida were complete (retort-shaped) and did not collapse, so structural failure of nests was probably not a factor that limited or retarded population growth in these colonies (cf., Krapu 1986). Nests at the colony on St. Vincent Island in both years were incomplete, required constant repair, and all three nests of Pair 1 in 1997 collapsed prior to fledging any young. The only two nests that remained intact in 1997 were placed on top of support poles. Even there, nest materials were barely adequate as these nests of Pairs 2 and 3 collapsed shortly after the young fledged.

We do not know whether the adult Cliff Swallows at the Franklin County breeding site originated from inland breeding populations expanding from the north, or from coastal populations expanding from the west. The location of the Franklin County colony, along the Gulf and fairly close to the established Mobile Bay colony, may favor the latter

origin. At the Martin County site, the subspecific identification of the adult male collected was the nominate race *P. p. pyrrhonota* (Sykes 1976), which has expanded from the north (Brown and Brown 1995). The identity of the coastal populations expanding from the west is apparently the recently described *ganieri* race that ranges inland to west-central Tennessee (Phillips 1986, Browning 1990). However, the distinctiveness of this race has been questioned (C. R. Brown, pers. comm.).

Summerour (1989) stated that the majority of birds sighted at the Mobile Bay colony had dark chestnut foreheads, and on this basis, suspected that these birds were from one of the two southwestern races, but this was never confirmed. One of six adults in 1997 and one of four in 1998 in Franklin County also had dark chestnut foreheads, similar in color to the sides of the head and throat (also see Stevenson and Anderson 1994:708). The dark chestnut forehead fits the southwestern race *melanogaster* (also probably *tachina*). The latter race is probably more likely to occur in Florida based on its documented breeding range. The darkest forehead color of eastern birds of the race *pyrrhonota* have been described as near avellaneous in color, pale cinnamon brown, or pale brown (Behle 1976, Browning 1992, Brown and Brown 1995). The forehead color of *pyrrhonota* and *ganieri* is indistinguishable (Phillips 1986, Brown and Brown 1995). Consequently, dark chestnut is darker than the darkest forehead color described for either *pyrrhonota* or *ganieri*. We believe that subspecific identification in Cliff Swallows cannot be made solely on the basis of sightings of forehead color. Nevertheless, birds with dark chestnut foreheads at colonies in coastal Alabama and northwest Florida are puzzling and should be collected to determine their subspecific identity reliably.

In summary, we provide documentation for the second breeding locality of Cliff Swallows in Florida, along the northwest Gulf coast at St. Vincent Island, Franklin County, in 1997 and 1998. Our verified evidence includes photographs of one recently fledged juvenile in 1997. This is the first juvenile Cliff Swallow banded and released in Florida. The small colonies of three and two pairs in 1997 and 1998, respectively, were at an anthropogenic nest site (boathouse) on a large body of water, which is typical of breeding populations of both races of Cliff Swallows that have recently expanded into the southeastern United States. Breeding at the Franklin County site was delayed in both years because of the poor quality of available nesting materials, especially in 1997 when three new detached nests of Pair 1 collapsed. Late arrival of pioneering birds may also have contributed toward delayed breeding both years. Two pairs in 1997 fledged young; complete breeding failure occurred at the same sites in 1998, suggesting the birds were the same individuals both years. Origins of the adult Franklin County birds are unknown, but they may have arrived from the west along the Gulf coast, which would identify them as the recently described race *ganieri*. One of six adult Cliff Swallows in 1997, and one of four adults in 1998 were birds (possibly the same individual) with a dark chestnut forehead. The origin of these birds is puzzling, but they could have been from either one of the two southwestern races *melanogaster* or *tachina*.

Acknowledgments

We thank J. Schuster of Ecological Resource Consultants, Inc., for conducting the soil analyses, R. Gay, U.S. Fish and Wildlife Service, for his observations at the colony site, and C. R. Brown, G. Jackson, and B. Summerour for providing unpublished observations on breeding information of Cliff Swallows in Alabama. We also thank C. R. Brown, R. Crawford, G. Jackson, B. Pranty, and P. W. Sykes, Jr., for reviewing a draft of our manuscript. Photographs of the juvenile Cliff Swallow are archived at Tall Timbers Research Station (TTRS P643-645).

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