

A Review of Nesting Sites used by Least Terns in South Carolina

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ABSTRACT

We analyzed records of Least Terns (*Sterna antillarum*) nesting in South Carolina prior to 1989 to determine trends in site selection. Least Tern colonies were documented on 4 site-types prior to 1960 and 7 site-types after 1960. Before 1960, 83% of colonies were on traditional sites (barrier island beaches and shellbanks, n = 19), and 17% were on atypical sites (dredged material and fill, n = 4). After 1960, 56% of colonies were on beaches and shellbanks (n = 34) and 44% were on atypical sites such as peagravel roofs (n = 10), dredged material/islands (n = 9), dirt and gravel fill from construction sites (n = 6), agricultural fields (n = 1), and inland lake beaches (n = 1). Initially nesting success on roofs was as high as or higher than on beaches. However, there is a current trend toward reroofing with new materials that Least Terns apparently will not use for nesting. Because a high percentage of statewide nesting is now on peagravel roofs that may be rendered unsuitable in the near future, Least Terns stand to lose a valuable buffer against natural habitat loss.

INTRODUCTION

Along the Atlantic coast, Least Terns traditionally nested on sand or shell beaches (Massey 1974, Wolk 1974, American Ornithologists' Union 1983). However, since the early 1960s a shift towards atypical nesting sites has occurred as development and other forms of human disturbance have increased (Fisk 1978, Jernigan et al. 1978, Gochfeld 1983). Gochfeld (1983) noted that contrary to historical records, terns in New Jersey were nesting on remote sites such as knobs and broad sand flats. He attributed this shift in site selection to a change in habitat availability caused by an increase in human use of beaches. In North Carolina, 72% of all nests were found on dredged material islands instead of natural beaches (Jernigan et al. 1978). Our goal was to determine if a similar shift to atypical sites was occurring in South Carolina. This research was carried out as part of a larger study designed to determine current distribution and population size of Least Terns nesting in South Carolina (Savereno 1992).

METHODS

We searched museum egg collection records (Charleston Museum, Clemson University's Department of Zoology Vertebrate Collection, Dennis Wildlife Center, Museum of York County, Schiele Museum (Gastonia, NC), and South Carolina State Museum), nesting databases (South Carolina Colonial Waterbird [SCCWD] [1989], South Carolina Nongame and Heritage Trust [SCHTD] [1990], Cornell Laboratory of Ornithology's Colonial Bird Register [CBR]), and pertinent scientific literature for information on Least Tern nesting sites in South Carolina prior to 1989. Most sites were classified as

to type of habitat based on information provided with the records or in the literature. We considered typical nesting sites to be any naturally occurring substrate used traditionally by Least Terns. Atypical sites were those created as a result of human activity that would not otherwise exist.

RESULTS

Seventy-six nesting sites were documented by word of mouth (D. Forsythe, pers. comm., The Citadel, M. Harrison, pers. comm., Porter-Gaud School), from egg collection records (Harlee 1936, Cutts 1962, Charleston Museum), nesting databases (CBR, SCCWD 1989, SCHTD 1990), and scientific literature, with the earliest dating to 1878¹ (Bowditch and Philipp 1910, Wayne 1910, Sprunt 1929, Tomkins 1959, Chamberlain 1960, Smith 1961, Beckett 1966, Post 1967, Teulings 1971, Downing 1973, Nugent 1974, Chamberlain and Chamberlain 1975, LeGrand 1976, Chamberlain 1978, Blus and Prouty 1979, Roche 1979, Portnoy et al. 1981, Rappole 1981, LeGrand 1983, Cornwell 1986, Cowgill 1989). Least Terns historically nested in all coastal counties. Most colonies were in Charleston County (n = 46). Three inland (non-coastal) nestings were also documented in the 1960s at two sites (Chamberlain 1960, Smith 1961, Post 1967). Four sites which could not be classified to habitat type were not included in further analyses.

Table 1. Number of Least Tern colonies in traditional and atypical sites in South Carolina.

Site	Before 1960	1960–1989	Total
Traditional ^a	19 (83%)	34 (56%)	43 (60%)
Atypical ^b	4 (17%)	27 (44%)	29 (40%)
Total	23	61	72

^aTen sites were used before and after 1960.

^bTwo sites were used before and after 1960.

Eleven documented sites were active only prior to 1960, fifty sites only from 1960 and after, and eleven sites both before and after 1960. Before 1960, colonies were located on 4 site-types. Nearly all colony sites before 1960 were on beaches and shellbanks (n = 19), although such atypical sites as dredged material (n = 2) and fill (n = 2) were also used (Table 1). After 1960 colonies were located on 7 site-types. In addition to nesting on beaches and shellbanks (n = 34), terns were recorded nesting on such atypical sites as peagravel roofs (n = 10), dredged material/islands (n = 9), dirt and gravel fill from construction sites (n = 6), agricultural fields (n = 1), and inland lake beaches (n = 1).

¹Colony locations, substrates, years active, and sources of information are available from T. M. Murphy.

DISCUSSION

Although thorough statewide surveys and censuses of Least Tern colonies were not conducted in South Carolina prior to the 1970s, some trends are evident. Prior to extensive coastal development, which began in the 1940s, most colonies were found on barrier islands and mainland beaches. Because Least Terns suffer heavy predation from mammalian and avian (e.g., gulls) predators, they typically locate their colonies on isolated spits or islets, with little or no vegetation (Sandifer et al. 1980). Wayne (1910) reported thousands of Least Terns breeding on Sullivan's Island before 1878 but near extinction in South Carolina by the early 1900s. This decline was attributed to the millinery market, which affected the entire Atlantic coast (Pough 1951, Fisk 1975). As harvest of Least Terns declined, Bowdish and Philipp (1910), found several remnant colonies (<50 pairs) on Raccoon Key and Morris Island. After commercial harvesting became illegal in 1913, the Least Tern population steadily increased. By 1927 the population within 80 km of Charleston had recovered to at least 600 pairs (Burton 1970). Tomkins (1959) reported that the species was abundant once again by the 1930s and 1940s.

Accelerated coastal development and increased human use of beaches led to widespread loss of suitable nesting habitat in the 1950s, with a corresponding decline in Least Tern numbers (Nisbet 1973, Fisk 1975, Burger 1984). Tomkins (1959) reported that the population had been reduced to 5-8% of its historical (before 1890) numbers by the late 1950s. In 1976, the Least Tern was placed on South Carolina's threatened species list (Gauthreaux et al. 1979).

Colony sites, such as Cape Island and Raccoon Key, which have persisted over a prolonged period despite documented losses to flooding and depredation, are typically remote from human disturbance (Bowdish and Philipp 1910, Downing 1973, Blus and Prouty 1979, Roche 1979, Thompson 1980, SCCWD 1989, SCHTD 1990). In contrast, developed sites such as Edisto Island, Hilton Head, Isle of Palms, Kiawah Island, and Sullivans Island, have been abandoned (Blus and Prouty 1979, Roche 1979, SCCWD 1989). Concurrent with the loss of these active colonies was an increase in the number of roof colonies in nearby areas (Savereno and Murphy, unpubl. data).

After 1960, there was an increase in atypical nesting sites, especially in areas of heavy development. Nearly all were found in Charleston County, where commercial and residential development and recreational use of beaches was particularly heavy. Although tar and peagravel roofs have been common in the Charleston area for 50 years (Robert Popp, pers. comm., GS Roofing Products Co., Charleston, SC), Least Terns were not known to nest on them until 1975 (Roche 1979). In 1979 and 1982 more colonies were found on roofs than on beaches in the Charleston area (Thompson 1980, 1982). In 1989, 38% (n = 12) of colonies and 14% (n = 231) of total nests statewide were on peagravel roofs. By 1990, the percent of total statewide nesting on peagravel roofs had increased to 34% (n = 542 nests; 35% of colonies [n = 11]) (Savereno 1992). During the 1994 nesting season, over half of colonies (52%; n = 14) and nests (60%; n = 1,008) were on peagravel roofs (T. Murphy, unpubl. data, SC Dept. of Natural Resources).

With the appearance of roof nesting in Florida in 1957 (Goodnight 1957) and South Carolina in 1975 (Roche 1979) a means of increasing and managing suitable nesting habitat became available (Fisk 1978). Hatching success was greater on roofs than on beaches in several studies (Roche 1979, Gore and Kinnison 1991). Cornwell (1986) documented a roof colony in Horry County with 95% hatching success. In the Charleston area we observed that in addition to increased hatching success, peagravel roofs were capable of supporting colonies as large as or larger than beach sites (Savereno 1992). However, roofing contractors have begun replacing tar and peagravel roofs with a smooth rolled plastic material in the last 5 years. Least terns have not yet been documented nesting on these new roofs (Gore and Kinnison 1991, Savereno and Murphy pers. obs.). A plausible explanation is that these surfaces lack the similarities in color and texture to shelly beach substrates than white peagravel provides. If this new roof substrate continues to replace peagravel roofs, many existing and potential nesting sites will be lost. Faced with the prospect of losing suitable roof habitat, active management of high-priority natural and remaining roof sites will become increasingly critical.

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