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DISTRIBUTION AND ABUNDANCE OF NESTING LEAST TERNS AND BLACK SKIMMERS IN NORTHWEST FLORIDA

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Abstract.—A survey of nesting Least Terns (*Sterna antillarum*) and Black Skimmers (*Rhynchops niger*) in northwest Florida was conducted from 22 May to 14 June, 1990. Of 76 sites that were active in one or more of the last five years, 45 (59%) supported nesting terns or skimmers in 1990. Of 42 Least Tern colonies containing an estimated 2364 nests, nine colonies were on beaches, nine on altered substrates such as dredge spoil, and 24 on roofs of buildings. Black Skimmers nested with terns in nine of the colonies and in three other colonies they nested alone. The 12 colonies contained 386 Black Skimmer nests, but 89% of the nests were in just five colonies. Two Black Skimmer colonies were on natural beaches, three on artificial substrates, and seven on roofs. Many more colonies and nests of both species were found in 1990 than in earlier surveys, but differences in survey intensity make population trends difficult to identify.

Least Terns (*Sterna antillarum*) and Black Skimmers (*Rhynchops niger*) regularly nest along the northern Gulf coast of Florida, but the number and size of their breeding colonies has not been well documented (Clapp et al. 1983, Spendelow and Patton 1988). Downing (1973) found only four colonies of terns and skimmers in northwest Florida in 1973, Fisk (1978) reported only two colonies on gravel-covered roofs as of 1976, and Clapp et al. (1983) identified only two colonies from 1976 to 1978. None of these surveys was comprehensive and, therefore, they probably underestimated the size of the breeding populations (Spendelow and Patton 1988).

The lack of a recent or intensive survey of Least Tern and Black Skimmer populations in northwest Florida provided the impetus for conducting the 1990 survey described here. The objective of this study was to determine the current distribution and abundance of nesting Least Terns and Black Skimmers and to compare this with data from past years. Surveys for estimating population size are particularly important for species such as the Least Tern and Black Skimmer because their

nesting colonies are frequently disturbed by humans or the habitat developed for other uses. Without a baseline assessment of abundance and distribution, it is impossible to objectively determine the relative status of populations of these species, to monitor trends in their population sizes, or to justify conservation actions.

Methods

Between 22 May and 14 June 1990, observers visited known locations of nesting colonies of Least Terns and Black Skimmers in northwest Florida from Wakulla County west to the Alabama border (Fig. 1). The sites surveyed were locations where I had observed or received reports of either species nesting during any year from 1985 to 1990. Because Least Tern and Black Skimmer colonies may change size or location within a nesting season (Nisbet 1973; Burger 1982, 1984; Massey and Fancher 1989), most surveys were conducted over a short period (1-4 June) near the peak of Least Tern nesting activity. This prevented double-counting of birds that renested at other sites during the season. Surveying sites simultaneously at the peak of nesting also reduced bias caused by surveying some sites when the numbers of nests were below peak levels. Although survey dates ranged from 22 May to 14 June because of logistical problems, only five active colonies were surveyed outside the 1-4 June period (Table 1).

Observers attempted to count all nests, adults, and chicks in a colony; however, this was not always possible. Because the number of adult birds present in a colony at a given time usually does not equal the number of breeding pairs in the colony (Nisbet 1973), observers tried to determine the number of nests in each colony. Depending upon the size of a colony and access to it, one of three survey methods was employed to determine the number of nests present. Where feasible, the number of nests was determined from the periphery of the colony by counting the number of birds sitting on nest scrapes (i.e., in incubating posture). In colonies where birds flushed, the observer walked through the colony and counted scrapes containing eggs or chicks. I classified these complete surveys as censuses. In some large colonies, a subset or sample of nests was counted and extrapolated to the entire nesting area. These surveys were classified as samples. Finally, at some colonies, particularly those on roofs with no access, the observer could not see nests nor incubating birds but the behavior of adult birds at the site indicated nests were present. In such cases, the number of nests was derived solely from the number of adults observed. Totals from these rather limited observations were classified as estimates.

Results

Forty-five (59%) of the 76 nesting sites surveyed in nine counties contained nests of Least Terns or Black Skimmers in 1990 (Fig. 1, Table 1). The remaining 31 (41%) sites, which had been active in at least one year since 1985, were vacant in 1990 (Fig. 1). Least Terns nested at 42 of the sites in 1990 and the number of nests/colony ranged from 1 to 704, with a mean of 56.3 nests/colony. Black Skimmers nested at only 12 sites, including two sites with just one skimmer nest. Least Terns nested along with Black Skimmers at nine of the sites, and terns had nested at the other three sites in past years (Gore, unpubl. data). The number of Black Skimmer nests at the 1990 colonies ranged from 1 to 208, with a mean of 32.2 nests/colony.

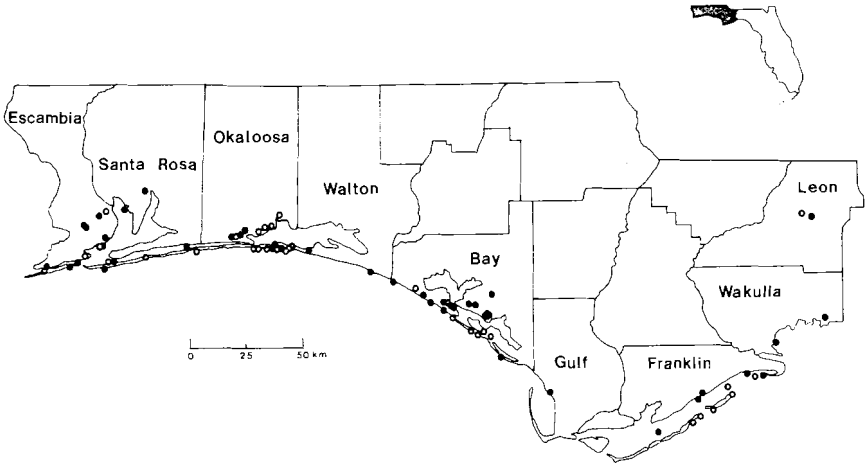

Figure 1. Distribution of active (•) and inactive (◦) sites of Least Tern and Black Skimmer nesting colonies in northwest Florida in 1990.

Eleven (24%) of the active colonies were on natural beach sites, while nine (20%) were on dredged material, land cleared for construction, road right-of-way, or other altered habitats, and 25 (56%) were on roofs of buildings (Table 1). Of the 42 colonies containing Least Terns, nine (21%) were on beaches, nine on altered substrate, and 24 (57%) on roofs. Two colonies containing Black Skimmer nests were on beaches, three on altered substrate, and seven on roofs.

DISCUSSION

When compared with earlier data from northwest Florida (Clapp et al. 1983, Downing 1973, and Fisk 1978), the 1990 survey results indicate that the breeding population of Least Terns increased markedly over the last 10 to 15 years, at least relative to the Black Skimmer population. Clapp et al. (1983) reported only two ground colonies (250 breeding pairs) of Least Terns and three ground colonies (200 breeding pairs) of Black Skimmers in northwest Florida from 1976 to 1978, but the current survey found 1012 Least Tern nests in 18 ground colonies and 288 Black Skimmer nests in five ground colonies. However, because the 1976 to 1978 survey was much larger in scope and apparently not intensive in its coverage (Clapp et al. 1983, Spendelow and Patton 1988), it is impossible to say whether observed differences represent an increase in the number of nesting birds or simply differences in the intensity of the surveys. Jackson and Jackson (1985), using more consistent observations, found that Least Tern populations in Mississippi had increased dramatically starting about 1976, which suggests that the apparent increase in Least

Table 1. Location and size of Least Tern and Black Skimmer nesting colonies in northwest Florida in 1990.

Colony location	Latitude	Longitude	Survey date	No. of nests		Survey type*	Habitat
				Terns	Skimmers		
Escambia County							
Fort Pickens East	30°19.0′	87°12.0′	1 June	4	0	Census	Beach
Pensacola Beach Bridge	30°20.0′	87°08.0′	1 June	12	25	Census	Other
Perdido Key East	30°19.0′	87°19.5′	4 June	23	0	Census	Beach
Big Lagoon Spoil	30°18.5′	87°25.5′	4 June	40	0	Estimate	Other
Delchamps-Inerarity Point	30°19.0′	87°25.5	2 June	125	0	Sample	Roof
Delchamps-Pensacola West	30°24.0′	87°20.5′	2 June	20	0	Census	Roof
Sears-University Mall	30°30.0′	87°13.5′	4 June	244	1	Census	Roof
Pensacola Port Authority	30°24.0′	87°12.5′	4 June	16	6	Census	Roof
Winn Dixie-Pensacola	30°24.0′	87°20.5′	2 June	53	0	Census	Roof
Crown Laundry-Pensacola	30°25.8′	87°13.1′	2 June	72	19	Census	Roof
Santa Rosa County							
Navarre Beach Causeway	30°23.0′	86°51.5′	4 June	113	42	Census	Other
S. C. Railroad Spoil Island	30°32.0′	87°08.0′	4 June	35	0	Estimate	Other
Six Flags Revco-Milton	30°37.0′	87°02.5′	4 June	30	0	Census	Roof
Okaloosa County							
Holiday Island-Noriego Point	30°23.5′	86°30.5′	1 June	0	11	Census	Beach
Okaloosa Island-East Pass	30°23.2′	86°31.0′	3 June	12	0	Census	Beach
Sun Plaza-Ft. Walton Beach	30°25.5′	86°38.5′	1 June	12	0	Census	Roof
Inlet Reef Condominium	30°23.0′	86°29.8′	4 June	47	0	Census	Roof
Sears-Santa Rosa Mall	30°25.0′	86°39.4′	1 June	17	0	Census	Roof
Choctawhatchee High School	30°27.0′	86°37.0′	1 June	50	1	Census	Roof
Walton County							
Eastern Lake Inlet	30°18.0′	86°05.5′	1 June	1	0	Census	Beach
Delchamps-Miramar Beach	30°22.5′	86°21.5′	1 June	225	0	Census	Roof
Bay County							
Crooked Island East	30°00.0′	85°32.5′	8 June	0	2	Census	Beach
Lake Powell Inlet	30°16.0′	85°59.0′	4 June	15	0	Estimate	Beach
Mariner West Lot	30°09.0′	85°46.0′	22 May	10	0	Census	Other
Naval Coastal Systems 110	30°10.5′	85°45.0′	14 June	7	0	Census	Roof

Table 1. (continued)

Colony location	Latitude	Longitude	Survey date	No. of nests		Survey type*	Habitat
				Terns	Skimmers		
Naval Coastal Systems 319	30°10.5′	85°45.0′	5 June	25	0	Census	Roof
Gayfers-Panama City	30°11.0′	85°43.5′	1 June	0	27	Census	Roof
Walmart-Parker	30°08.5′	85°20.5′	1 June	50	43	Sample	Roof
Vacant Winn Dixie-Parker	30°08.5′	85°20.5′	1 June	44	1	Sample	Roof
Kmart-Parker	30°08.5′	85°20.5′	1 June	20	0	Sample	Roof
Panama City Outlet Mall	30°11.0′	85°43.6′	3 June	18	0	Census	Roof
Surfside Middle School	30°42.1′	85°49.8′	1 June	200	0	Sample	Roof
Winn Dixie/TG&Y-Panama City	30°11.2′	85°46.0′	1 June	20	0	Estimate	Roof
Sports Park-Panama City Beach	30°42.7′	85°52.4′	4 June	10	0	Estimate	Roof
Lo-Mark Building-Parker	30°08.7′	85°25.5′	1 June	8	0	Estimate	Roof
Merritt Brown School	30°14.5′	85°33.8′	2 June	10	0	Estimate	Roof
Gulf County							
Highland View	29°50.0′	85°18.5′	1 June	4	0	Estimate	Beach
Franklin County							
Alligator Point	29°54.0′	84°25.5′	4 June	7	0	Census	Beach
St. George Causeway	29°42.0′	84°53.0′	1 June	704	208	Census	Other
Carrabelle River Island	29°51.0′	84°40.5′	2 June	10	0	Sample	Other
Carrabelle Beach	29°49.9′	84°41.1′	3 June	8	0	Census	Beach
FSU Marine Lab	29°54.9′	84°30.6′	3 June	1	0	Census	Beach
Leon County							
Mahan Publix-Tallahassee	30°27.5′	84°13.5′	3 June	29	0	Sample	Roof
Wakulla County							
Fiddler's Point	30°01.0′	84°22.0′	2 June	1	0	Census	Other
Stony Bayou-St. Marks N.W.R.	30°07.5′	84°08.5′	28 May	12	0	Census	Other
Total				2364	386		

*Census represents a count of all nests in colony, sample data are extrapolated from observations of a known portion of the colony, and estimates are predicted values based upon potential of the nesting area and observation of an unknown portion of the nesting population.

Tern numbers in northwest Florida may be real. In any case, neither Least Tern nor Black Skimmer populations have declined, as was earlier feared they would (Downing 1973, Fisk 1978).

The causeways to Navarre Beach and St. George Island provide nesting Least Terns and Black Skimmers with protection from mammalian predators and, to a lesser extent, disturbance by humans. Consequently, nesting colonies on the causeways appear to be more successful than at other ground sites. In 1990, the two causeway sites produced 81% of the 1012 Least Tern nests found at ground colonies and 87% of the 288 Black Skimmer nests at ground colonies (Table 1.)

Gravel-covered roofs have become important nesting habitat for Least Terns in northwest Florida, and in 1990 over half of the Least Tern colonies and 57% of the nests were on roofs (Table 1). Fisk (1978) reported only two Least Tern colonies and no Black Skimmers on roofs in northwest Florida as of 1976. Even if Fisk's survey was not comprehensive, the 24 Least Tern colonies found on roofs in 1990 indicate that roof-nesting colonies have increased in number. The presence of colonies on several buildings built since 1976 substantiates this conclusion. Although roof-nesting has apparently been beneficial to Least Tern populations in northwest Florida, not all roof colonies are productive (Fisk 1978, Gore and Kinnison 1991). Furthermore, many of the gravel-covered roofs on which terns nest are being replaced by smooth plastic roofs which the birds cannot use (Gore and Kinnison 1991). Three roofs that supported approximately 150 Least Tern nests in 1989 were re-covered with plastic roofing, and no birds nested on them in 1990. Because most Least Tern colonies and nests in northwest Florida are on roofs, future trends in Least Tern populations may be governed largely by productivity of roof colonies and availability of gravel-covered roofs.

The number of Black Skimmers nesting on roofs in northwest Florida has also certainly increased since Fisk's 1976 survey. Skimmers were first recorded nesting on a roof in Pensacola in 1986 (Gore 1987), although they may have nested there for several years. Nesting skimmers were first observed on roofs in Panama City in 1987 and in Ft. Walton Beach in 1990 (Gore, unpubl. data). This recent increase in roof-nesting and the fact that seven of 12 skimmer nesting sites in 1990 were on roofs suggest that roofs are important nesting habitat for skimmers. However, Black Skimmer nests on roofs typically fail (Greene and Kale 1976, Gore 1987), so the increasing use of roofs by nesting Black Skimmers may indicate a lack of suitable nesting sites on beaches or an attraction to roof-nesting colonies of Least Terns rather than a preference for roofs as nesting habitat.

Because the 1990 survey covered only locations where colonies had been reported rather than all potential nesting habitat, colonies in the most visible locations were more likely to be surveyed. All recent nesting

sites on beaches or coastal spoil islands were probably included in the survey because not only are these colonies conspicuous but virtually all of the beach habitat of northwest Florida was searched for colonies on more than one occasion in recent years by birdwatchers, land managers, or biologists. The large gaps between nesting colonies along the northwest Florida coast (Fig. 1), therefore, probably represent a true absence of colonies rather than incomplete surveys.

Although numerous observers have been identifying new roof colonies in northwest Florida over the past few years, the 1990 survey likely missed some roof colonies. As evidence, two small colonies (Food World #57 in Walton County and Tyndall Base Support Center in Bay County) were found late in the season and, although not included in the survey results, they may have been active throughout the summer. Ground colonies at remote inland sites were even less likely to be detected. Because I knew of no colonies on dredge spoil along the intracoastal waterway, that habitat was not covered by the 1990 survey.

Only experienced observers conducted the surveys and accuracy in estimating colony size likely varied more among the three survey methods than among observers. For example, at one roof colony that was surveyed twice, an "estimate" made from the ground predicted six Least Tern nests were present but a "sample" survey from upon the roof found 44 nests.

Although a single-count survey reduces the chance of double-counting renesting birds, any late-nesting pairs, particularly second-year birds will be missed (Massey and Atwood 1981). In addition, the survey may have slightly underestimated the number of nesting Black Skimmers because they typically initiate nesting later in the season than Least Terns (Jackson et al. 1979) and the number of nests may not have peaked by the 1-4 June survey.

Dire predictions regarding the fate of the Least Tern in Florida (Downing 1973, Fisk 1978) fortunately have not come to pass, but because regular and adequate monitoring was not conducted we can only speculate about recent population trends. I suspect that Least Tern populations have increased, due largely to increased nesting on roofs, and that Black Skimmer populations have been stable. If the distribution and abundance of Least Terns and Black Skimmers are monitored more consistently and frequently, we will have a better understanding of population trends and a clearer view of the conservation actions needed to protect these species.

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