

A Major Bridled Tern (*Sterna anaethetus*) Colony in the Gulf of Fonseca, Nicaragua

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Abstract.—On 5 August 1994, the islets of Los Farallones in the Gulf of Fonseca, Nicaragua, contained a colony of Bridled Tern (*Sterna anaethetus*), consisting of at least 1,200 adults and nine chicks. We estimated the size of the colony as 600 breeding pairs, considering that many adults were feeding at sea, and also that some of the adults present may not have been breeding. Breeding colonies of the eastern Pacific Ocean race, *S. a. nelsoni*, have been confirmed at only two other sites, in Mexico and Costa Rica. The Los Farallones colony is much larger than the other reported colonies, and may represent the major portion of the breeding population of *S. a. nelsoni*. Bridled Terns at Los Farallones did not exhibit nest defense behavior as described from other colonies, suggesting that there is little nest predation or disturbance at the colony. Received 12 April 1996, accepted 13 July 1996.

Resumen.—El 5 de agosto de 1994, las isletas de Los Farallones en el Golfo de Fonseca, Nicaragua, contenía una colonia de *Sterna anaethetus*, con al menos 1200 adultos y nueve polluelos. Se estimó el tamaño de la colonia en 600 parejas reproductoras, tomando en cuenta que muchos de los adultos estaban buscando comida fuera del sitio, y también que algunos de los adultos presentes posiblemente no eran reproductores. Colonias de la población *S. a. nelsoni*, de la región oriental del Océano Pacífico, se han confirmado solamente en dos sitios más, en México y Costa Rica. La colonia en Los Farallones es mucho mayor que las otras colonias, y puede representar la mayor parte de la población reproductora de *S. a. nelsoni*. Las aves en Los Farallones no mostraron comportamiento de defensa descrito de otras colonias, lo que sugiere que hay poca predación o perturbancia en la colonia.

Key words.—Breeding colony, Bridled Tern, distribution, Gulf of Fonseca, Los Farallones, Nicaragua, status, *Sterna anaethetus*.

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Relative to other sea birds in its range, the eastern Pacific Ocean subspecies of the Bridled Tern (*Sterna anaethetus nelsoni*) is a rare bird (Pitman 1986, Ridgely and Gwynne 1989, Howell and Webb 1995). Breeding has been documented only in Costa Rica and México, with a total estimated breeding population of less than 350 pairs (Stiles and Smith 1977, Stiles 1984, Howell *et al.* 1990, Howell and Engel 1993). Several potential breeding sites have been suggested, from Colombia to México (Murphy 1938, Wetmore 1965, Stiles and Smith 1977, Hilty and Brown 1986, Ridgely and Gwynne 1989, Howell and Engel 1993). We investigated a potential breeding site reported from islets known as Los Farallones in the Gulf of Fonseca, Nicaragua (Thurber *et al.* 1987), where we found a major breeding colony of Bridled Terns.

STUDY AREA AND METHODS

Los Farallones are situated in the entrance to the Gulf of Fonseca, in Nicaraguan waters, at 13°05'N, 87°40'W. They are about 8 km southeast of the nearest

island, Isla Meanguera, El Salvador, and about the same distance northwest of the Nicaraguan mainland (Fig. 1). Open ocean lies to the southwest, and the Honduran mainland to the northeast. In the past, the islands have been claimed by El Salvador, Honduras, and Nicaragua (e.g., Herrera-Cáceres 1974). At the time of this study, Nicaraguan jurisdiction over the islands was popularly recognized.

Los Farallones appear to be of volcanic origin, and consist of three small islands, two substantial rocks, and two very small outcrops that are submerged during high tides. The three islands have steep cliffs facing northwest, with vegetated rocky slopes falling away from the cliffs that are eroded in some places to form lower cliffs. The geography appears to be due either to severe uplifting, or the islands are the only visible remains of a volcanic crater rim. The islets, all within 500 m of each other, extend in an arc.

The largest islet is about 100 m long, and 40 m wide at the middle, with tapered ends. The highest point is about 30 m above sea level at the top of the northwest-facing cliff. A small beach at one end consists of large stones and medium-sized boulders. We called the two smallest vegetated islets the "twins" (*los gemelos*), because they are similar and adjacent to each other, being separated by a channel 25 m across. They appear to have formerly formed a single islet. The larger of the "twins" was about 50 m wide, and its sea-cliffs reached 25 m high.

One of the larger rocks is separated from the largest islet by a channel 5 m wide. The other is a pillar-shaped rock about 200 m to the west, the outermost of the islets. The rock adjacent to the largest islet was 8 m tall, 30 m

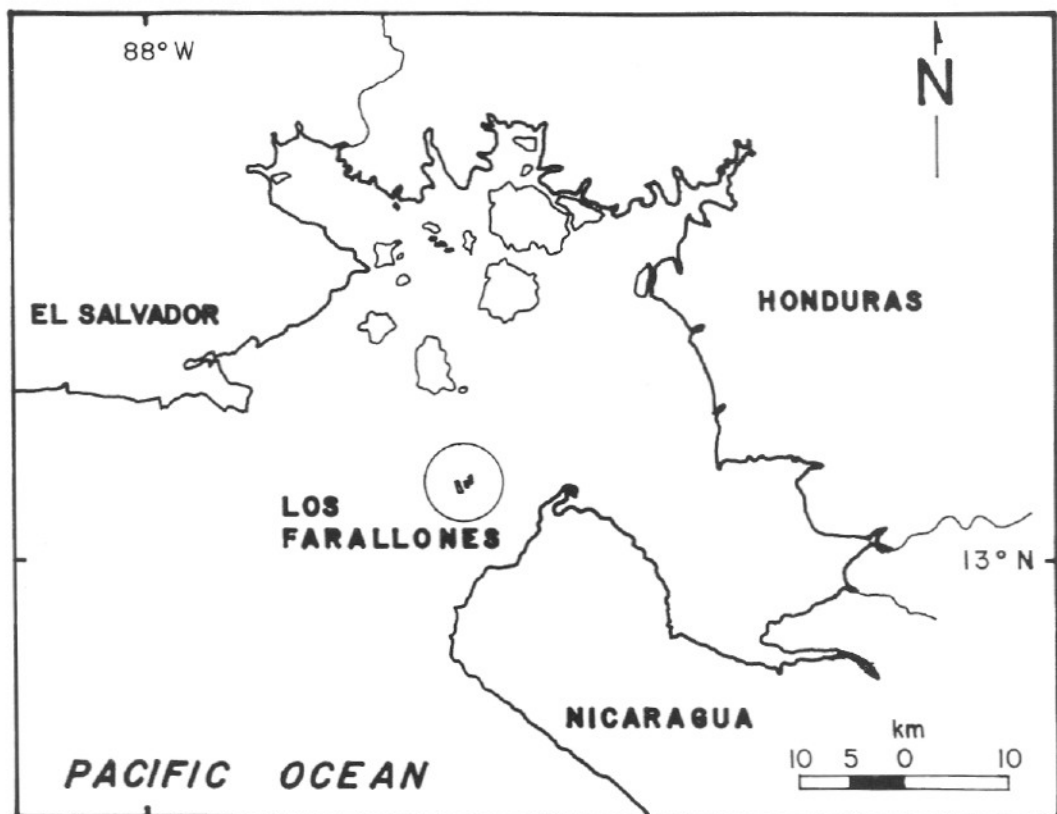


Figure 1. Map showing location of Los Farallones, encircled, in the Gulf of Fonseca (adapted from Herrera-Cáceres 1974).

long, and about 10 m wide at its widest point. The pillar rock was about 15 m tall at low tide.

The three largest islets were covered by thick bunch grass (Gramineae), 0.5-1.0 m tall. The more gently sloping "crown" of the largest islet provided growing space for scattered groups of a long-leaved, agave-like succulent plant (Agavaceae) and at least two other types of grasses growing among the bunch grass. At least two types of ferns grew on the walls of a shallow cave in the face of the largest cliff.

We visited Los Farallones on 5 August 1994. To get to the islands we used a 24 ft launch with 40 hp motor, leaving El Tamarindo, El Salvador at 0722 h, and arriving at the study site at 0812 h, at low tide. Because of calm seas, we were able to disembark on two of the islands and explore for 3 h. We estimated the number of adult terns as they flushed while we circled the islets by boat. We documented breeding by locating nests and photographing eggs and young in different stages of development.

RESULTS

We observed pairs of Bridled Terns perched on all of the islets. Three pairs were perched at the rock pillar, and one pair was flying around it, one bird rapidly chasing the

other. About 600 adults, many giving a nasal "kaw," flushed from the large islet, where we found five chicks at the entrance to cavities under ledges or in burrows under rocks; we also found a dead chick. There were 600 adults at the "twins," where we found three half-grown chicks, one downy hatchling, and one egg (light beige, 45×33 mm).

The nesting density seemed highest on the small "twin," where three chicks and one egg were within a diameter of 3 m. Unfortunately, we could visit the "twins" for only a few minutes. Additional searching might have uncovered many more nests. Nesting activity was focused on steep slopes and cliffs with abundant rocks and crevices. We found no evidence of nesting in the area of dense vegetation on top of the largest islet. In all, we observed about 1,200 adults, nine live young and one egg, all of which we documented with color photos.

We suspect that we failed to detect many hatchlings and eggs hidden in burrows or sheltered caves. If all the adults present at Los Farallones represented breeding pairs (most perched birds were in pairs), then the breeding population was at least 600 pairs. All birds were in breeding plumage, but some of the adults present may have been non-breeders.

We did not detect other seabirds breeding at Los Farallones. Several species were present, however. We observed adult Brown Pelicans (*Pelecanus occidentalis*) but no immatures. Of 330 Magnificent Frigatebirds (*Fregata magnificens*) present, 90% were adults, but only one male had his red throat pouch extended. Thirty-two Blue-footed Boobies (*Sula nebouxi*) were all adults. We counted 307 Brown Boobies (*S. leucogaster*), of which 45 were adults and 262 were immatures. None appeared to have recently fledged. The only other bird species we encountered at Los Farallones was the Gray-breasted Martin (*Progne chalybea*), with four individuals.

DISCUSSION

The Bridled Tern has been reported from Los Farallones once before, by Peter Hamel (Thurber *et al.* 1987). Hamel observed about 50 adults and one immature, but no breeding activity, on 20 July 1974. A smaller number was present when he visited the islets briefly on 29 June 1974. Ornithologists did not encounter terns during two other visits to the islets, on 10 October 1962 (Monroe 1968) and on 6 January 1993 (pers. obs.).

Colony Size

We believe 600 pairs is a conservative estimate of the size of the colony at Los Farallones. Although some of the adults we observed may have been non-breeding, two factors support the argument that virtually all adults present were breeders. First, non-breeders should be most prevalent late in the breeding season (Dunlop and Jenkins 1992), and we believe that our visit coincided with the middle of the breeding season.

Breeding appeared to be just getting underway for some birds. Many pairs perched on the islets appeared to be guarding future nest sites. Bridled Terns are known to occupy nesting sites in Australia for three to five weeks prior to egg-laying (Hulsman and Langham 1985). Second, we visited the colony during mid-morning, when non-breeders were likely to be on feeding grounds at sea. Non-breeding Bridled Terns most often visited a colony in Australia to roost at night and left early in the morning (Dunlop and Jenkins 1992). We believe feeding occurs offshore because we observed no terns feeding near the islets, and only one feeding 4 km north, towards the island of Meanguera, El Salvador.

Many breeding adults may have been feeding at sea during our visit, and thus the colony may have been substantially larger than it appeared. Hulsman and Langham (1985) studied the changes in tern populations at a colony during a single day when chicks were three weeks old. They discovered that only about 70% of the adults were present at first light, about 50% by 0900 h, about 36% at 1200 h, and virtually no terns were visible at 1600 h. The most terns were counted at 1800 h when birds returned to roost. Half the breeding adults in the colony may have been absent during our visit, if a similar attendance pattern occurs, suggesting a breeding population of 1,200 pairs. We believe further observations at Los Farallones are necessary before proposing such a large estimate, but this colony may well represent a large proportion of the total population in the eastern Pacific.

Predation and Disturbance

The colony at Los Farallones may be successful because no natural predators (gulls, other terns, mammals, reptiles) occur on the islands (pers. obs.). Boat landings are only possible during calm seas, and even then are difficult. We did not observe any human refuse or signs of recent human presence on the main island. The terns did not show the nest defense behavior described from other colonies (Hulsman and Langham 1985):

they did not dive at human intruders, nor distract us with broken-wing displays. However, our presence greatly disturbed the colony. Just approaching an islet by boat caused massive flights of terns.

During our visit, three teenagers arrived from Honduras to fish in the shallows between the islets. The boys disembarked at one of the "twin" islets and captured a juvenile tern, which they began to take with them upon leaving the island. We convinced them to leave the bird at its nest. The boys found eggs during their previous visit around 1 July, but we do not know which species.

Conservation Needs

Los Farallones do not currently receive any legal protection from the Nicaraguan government (Jaime Incer, pers. comm.). Based on current knowledge of breeding colonies, Los Farallones may be key to the survival of the eastern Pacific subspecies of the Bridled Tern. The colony appears to be larger than all other known colonies combined. Further study of the threats and conservation needs of the colony and other potential seabird colonies in the Gulf of Fonseca is needed.

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