

## BREEDING SEABIRDS OF MORROS EL POTOSÍ, GUERRERO, MEXICO

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Information on the seabirds of northwestern Mexico has accumulated for several decades now, but seabirds along the country's southern Pacific coast remain little studied. Morros El Potosí (17° 31' 57" N, 101° 29' 18" W; known as "White Friars Rocks" in the American navigation literature) consist of three small islands and several rocks 3 km offshore and 15 km east of the city of Zihuatanejo, Guerrero (Figure 1). The main islands are 50–65 m high (Hydrographic Office 1937) and very steep, with vertical cliffs on their southern faces.

Howell and Webb (1995) reported actual or suspected breeding by Brown Boobies (*Sula leucogaster*), Red-billed Tropicbirds (*Phaethon aethereus*), and Brown Noddies (*Anous stolidus*) on these islands. Eggs of the Bridled Tern (*Sterna anaethetus*) were collected in 1903, and a specimen was collected in 1937, but there are no recent confirmed records of this species breeding on the islands (Howell and Engel 1993, Howell et al. 1990). No further reports on the island's breeding birds exist. We visited the islands on 23 May 2003 and 13–14 May 2004. Restricted by time and landing possibilities, we visited only the largest, eastern island.

*Red-billed Tropicbird*. This species nests on many islands of western Mexico, with Morros El Potosí being southernmost of the known localities (Friedmann et al. 1950,



Figure 1. Morros El Potosí, Guerrero, Mexico.

Photo by Eric Mellink and Mónica Riojas-López

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Howell and Webb 1995). Howell and Engel (1993) recorded four or five pairs there on 3 May 1992. In both 2003 and 2004 we observed adults in flight, a few nests with chicks, and some fledglings. From this evidence we estimated that El Potosí supported no more than a few dozen breeding pairs. However, the larger Red-billed Tropicbird colony at Farallón de San Ignacio in northern Sinaloa contained only the latest-nesting individuals in May 2003 and May 2004 (José Alfredo Castillo pers. comm.), suggesting that El Potosí could support over 100 pairs earlier in the season. Visits between January and March would yield a firmer estimate of colony size.

*Brown Booby*. The colony at El Potosí was photographed by Goldman (1951), and Howell and Engel (1993) counted 6000–6500 individuals on 3 May 1992. We are not aware of any other documentation of this colony.

Morros El Potosí lie between the reported ranges of *S. l. brewsteri* and *S. l. etesiaca* (Schreiber and Norton 2002), which differ in the extent of white on the heads of males; *etesiacca* has the white more restricted around the base of the bill. Goldman (1951) considered the boobies at Morros El Potosí to be *brewsteri*. We compared the males at the colony with the descriptions by Goss (1888), Thayer and Bangs (1905), Wetmore (1939), and with photographs by Philip Unitt of specimens of both subspecies at the American Museum of Natural History, New York; we agree on the subspecific identity.

The colony of Brown Boobies at Morros El Potosí (Figure 2) is the densest we have seen. In 2004, using two 50-m lines with points every 5 m, we estimated nest density through point-centered quadrats (Pollard 1971). One line ran up one of the slopes of the island; the other, along the narrow top. We calculated a density of 2078 nests per hectare on the slope and 3325 nests per hectare along the top. Because of the inaccessibility of the other two islands, and time constraints, we were unable to estimate the total colony size with any precision.

The boobies' nesting chronology was similar in 2003 and 2004, their nests containing mostly eggs or small chicks at the time of our visits in both years (Table 1). We



Figure 2. Brown Boobies nesting on Morros El Potosí.

Photo by Eric Mellink and Mónica Riojas-López

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**Table 1** Contents of Brown Booby Nests on Morros El Potosí

	23 May 2003	13 May 2004
1 egg	12	10
2 eggs	19	11
1 egg, 1 chick	6	3
2 eggs, 1 chick	0	1
1 chick	12	13
2 chicks	1	0
Total	50	38

observed a few pairs courting, plus some larger chicks and juveniles. Brown Boobies tend to nest earlier than this on other islands of western Mexico (Mellink 2000). The colony at Farallón de San Ignacio finished nesting in April 2003 and in May 2004. The colony at San Jorge, Sonora, was nearly finished with breeding in May 2004. In 2003, breeding was depressed early in the season by El Niño conditions at San Jorge. We lack information to explain the relatively late breeding at Morros El Potosí.

Molt in this species is little known (Schreiber and Norton 2002). In May 2004, while attaching capillary tubes to determine diving depth (see below), we examined 13 females and 12 males, and all but one female and three males were growing at least one new rectrix in the middle portion of the tail.

We determined the maximum diving depth of nine males and five females by using capillary tubes attached to a central rectrix (Burger and Wilson 1988) for one day. To minimize the potential for variations due to water mass, we calibrated the method with one controlled immersion. The birds' maximum diving depth was  $1.55 \pm 0.74$  m (mean  $\pm$  standard deviation), with no difference between males and females.

Three birds to which we attached capillary tubes at 1130, 1210, and 1216 hours on 13 May 2004 were replaced by mates at their nests by 1330 of that day. Two of these individuals had returned by 0830 the next morning. Overall, however, 61% of the tube-outfitted birds could not be relocated the following morning (0800–1200). At Isla San Jorge and Farallón de San Ignacio, in the Gulf of California, Mellink and José Alfredo Castillo (pers. comm.) have been recovering most capillary tubes the morning after they are attached. This difference might suggest that the boobies at El Potosí were foraging farther from the colony. We did not see feeding by adults, but some juveniles were feeding near the beach of Barra El Potosí.

A piece of fish on the ground and two regurgitations by boobies consisted of the Bigwing Halfbeak (*Oxyphorhampus micropterus*). One male, which regurgitated three halfbeaks, recorded a maximum diving depth of 1.96 m. Another regurgitation contained juveniles of the Whitemouth Jack (*Uraspis heluola*).

**Bridled Tern.** This species (Figure 3) was a common breeder on the island, although much less abundant than the Brown Booby. It was difficult to assess population size, as this species nests in crevices. Nests were all over the island, often very close to Brown Booby nests. Our best estimate, based on the nests and individuals seen, was several hundred pairs. Eleven of 12 nests examined in 2003 held a single egg, the other a chick. All of the ten nests examined in 2004 contained one egg.

A single regurgitation contained fish larvae (of apparently two species), one damselbug (Hemiptera: Nabidae), and two winged ants (Hymenoptera: Formicidae). The contents of this regurgitation are within the described diet of the species (Haney et al. 1999). At about 0800 hours on 14 May 2004 we observed a single-species feeding flock of about 50 Bridled Terns at sea near the estuary of Laguna El Potosí.

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Figure 3. Bridled Tern on Morros El Potosí.

*Photo by Eric Mellink and Mónica Riojas-López*

*Brown Noddy*. This species had not been confirmed nesting on El Potosí, although Howell and Engel (1993) suspected it to do so. We found a single egg in each of the four nests we examined in 2003. From counts of adults in 2003 and 2004, we estimated the population at approximately 100 pairs. We saw a single-species feeding flock of 50–60 Brown Noddies near Cerro de los Pirules, the closest point on the mainland.

The seabird colonies at Morros El Potosí seem to be free from direct threats. Landing is difficult, effectively preventing use of the islands by fishermen and other visitors. The islands' proximity to the fishing village makes a camp there unnecessary. We saw no gulls and found no evidence of rats or other predators; indeed, abandoned eggs remained intact without any traces of predation.

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