

ADDITIONS TO THE BREEDING SEABIRDS OF MALPELO ISLAND, COLOMBIA

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The Masked Booby *Sula dactylatra*, the Red-footed Booby *Sula sula*, the Brown Noddy *Anous stolidus*, the Black Noddy *Anous minutus*, and the White Tern *Gygis alba* breed on islands of the Eastern Pacific Ocean among other tropical islands worldwide (Anderson 1993, Chardine & Morris 1996, Schreiber *et al.* 1996, Niethammer & Patrick 1998, Gauger 1999). Their reproduction on Malpelo has been suggested previously (Pitman *et al.* 1995, Álvarez-Rebolledo 2000), but conclusive information was unavailable. We present data here confirming their breeding at this location.

Malpelo is an oceanic island (04°0'15"N 81°36'30"W) surrounded by 11 islets, about 380 km off the nearest point on the mainland of Colombia. It has an area of about 0.63 km² above sea level and its maximum elevation is about 300 m. Because of its volcanic origin, the island has a rugged topography with steep slopes all around. Most of its surface is devoid of vegetation; only small patches of ferns and grasses and a seasonal and abundant cover of microalgae and lichens are present. The island was free of permanent human presence until 1986, when the Colombian Navy established a small military detachment (Prahl 1990). In 1995, the island was declared a Fauna and Flora Sanctuary (Castaño & Cano 1998). Malpelo hosts the largest colony of Nazca Boobies *Sula granti* in the world, as well as a small colony of the Swallow-tailed Gulls *Creagrus furcatus* (Pitman *et al.* 1995).

Between October 2003 and June 2006, we made 10 visits to Malpelo in different months of the year, for three to 30 days per trip. During every visit, we made observations between 06h00 and

20h00, walking around the central and southern sectors of the island and sailing around and through the islets. On several occasions we climbed the slopes to make detailed observations and to take photographs. We did direct counts of adults (both breeding and non-breeding) to estimate population size of the seabird colonies. The number of birds of each species we report is the maximum of adult individuals in a single count. The island's topography and surge conditions made it impossible for us to cover the whole island during any one census, and so our estimates are conservative.

- **Masked Booby (c. 10 individuals)**—We found two Masked Booby pairs breeding in March 2006 on the southern portion of the island: one pair with an egg and a hatchling; the other with a chick. Another pair with a chick was sighted in June 2006 on the northern portion of the island.
- **Red-footed Booby (c. 50 individuals)**—The Red-footed Booby occurs year-round at Malpelo in small numbers. We saw at least 20 individuals on each visit, including all color morphs from white to brown. The majority were light brown. A small colony of 7–12 nests was located on the southern portion of the island, and a smaller one with at least four to five nests on one of the northern islets. We saw only one egg in February 2005, and in April of the same year no chick was present at the same site. We saw Malpelo's land crab *Gecarcinus malpilensis* eating nest materials of this species on every visit to the main island of Malpelo.
- **Brown Noddy (c. 600 individuals)**—The Brown Noddy occurs seasonally on Malpelo; the largest numbers were recorded in the

TABLE 1
Potential and confirmed breeding records of seabirds on Malpelo Island, excluding the Nazca Booby and the Swallow-tailed Gull, which are widely mentioned in the literature as breeders on the island^a

Common name	Scientific name	Month											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Red-billed Tropicbird	<i>Phaethon aethereus</i> ^b			2	6			6	6	4,6	4,6		
Masked Booby	<i>Sula dactylatra</i>			6			6						6
Red-footed Booby	<i>Sula sula</i> ^{b,c}		6	3,6	6			6	6	4,6	6		4,6
Magnificent Frigatebird	<i>Fregata magnificens</i> ^b		6	6	6	5		6	6	4,6	4,6	4	4
Great Frigatebird	<i>Fregata minor</i>		6	6	6			6	6	4,6	4,6		4
Brown Noddy	<i>Anous stolidus</i>		1			5	5	6	6	6	4,6		
Black Noddy	<i>Anous minutus</i>		1			5		6	6	4,6	4,6		
White Tern	<i>Gygis alba</i>					5		6	6	4,6	4,6	4	

^a Numbers denote sources of the records as follows: (1) Bond & Meyer de Schauensee 1938, (2) Murphy 1945, (3) Kiester & Hoffman 1972, (4) Pitman *et al.* 1995, (5) Álvarez-Rebolledo 2000, (6) our data.

^b Prahl (1990) also provides records for these species, but without dates.

^c Our data for *Sula dactylatra* and *S. sula* in December are from photos taken by Lieutenant de la Cruz of the Colombian Navy.

second half of 2004 (July, August, September). Brown Noddies nested in caves and on cliff edges and rock shelves. Most nests were on the northern end of the main island and on the northern islets. Most were situated close to the water, but some were built about 200 m above sea level. All but one of the nests checked between July and September 2004 had a single egg. On several occasions, one or more Great Frigatebirds *Fregata minor* were seen harassing the adults on their nests, but no brood predation could be confirmed.

- **Black Noddy (c. 500 individuals)**—The Black Noddy is also a seasonal species at Malpelo, with the largest numbers occurring in the second half of 2004. It shared breeding areas with the Brown Noddy, but apparently was limited to the lower parts of the slopes, because no nests were found above the 10-m elevation. All the nests checked had a single egg.
- **White Tern (c. 500 individuals)**—Another seasonal species on Malpelo, White Terns were particularly abundant in the second half of 2004. They did not breed colonially. Rather, scattered nest sites were located on the northern side of the island, on the islets, and in a few other parts of the island from 7 m to 10 m above median sea level up to the tops of the cliffs. In all cases, the single egg was placed in a small crevice or on a rock shelf. We saw fledglings flying with their parents in October 2003 and September 2004.

The breeding conditions and characteristics of the above five species at Malpelo are consistent with the descriptions of other colonies in the Eastern Pacific Ocean (Anderson 1993, Chardine & Morris 1996, Schreiber *et al.* 1996, Niethammer & Patrick 1998, Gauger 1999), but populations are comparatively small and residence of the three tern-like species is seasonal instead of continuous throughout the year. The small sizes of the colonies may be due to the presence of terrestrial predators such as Malpelo's land crab and the endemic lizard *Diploglossus millepunctatus*, and aerial predators such as frigatebirds, which restrict the available safe sites for breeding to a few marginal locations on the island and its associated islets.

The absence of previous confirmed breeding records of these five seabirds on Malpelo can be attributed to the lack of detailed ornithological observations over the whole island, including different but consecutive periods of the same year. Nevertheless, it is possible that the birds were not breeding during the visits of several ornithologists in the second half of the year (e.g. Pitman *et al.* 1995).

It is likely that some individuals that breed on Malpelo derive from other populations nesting elsewhere in the Eastern Pacific, which could best be assessed through banding or genetic comparisons. The principal colonies for these species close to Malpelo are located on Clipperton Island (c. 2650 km away), Cocos Island (c. 620 km) and the Galapagos (c. 1100 km) (Anderson 1993, Chardine & Morris 1996, Schreiber *et al.* 1996, Niethammer & Patrick 1998, Gauger 1999).

To date, seven species of seabirds are known to breed on Malpelo: the five species recorded here, plus the Nazca Booby and the Swallow-tailed Gull. Previous observations and ours suggest that the Red-billed Tropicbird *Phaethon aethereus*, the Magnificent

Frigatebird *Fregata magnificens* and the Great Frigatebird may also nest on Malpelo, but conclusive evidence, such as eggs, chicks or fledglings is still lacking (Pitman *et al.* 1995, pers. obs.).

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