

Inca Terns in the Bay of Panama during the 1982–1983 El Niño event

Range extension of 1400 kilometers in the Inca Tern coincides with cessation of upwelling of the cold, nutrient-rich waters of the Peruvian Current off the west coast of South America



Figure 1. One of many Inca Terns (*Larosterna inca*), a seabird of the Peruvian Current, observed in the Bay of Panama during the summer of 1983. This range extension of 1400 kilometers is most likely a result of the collapse of the Peruvian anchovy and sardine populations during the 1982–1983 El Niño event. Photo/Jonathan R. Reed.

IN THE SUMMER OF 1983 A NUMBER of South American seabird species were seen in the Bay of Panama for the first time. These range extensions coincided with the atypical 1982–1983 El Niño event. El Niño is defined as the appearance and persistence, for six to

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18 months, of anomalous warm water in the coastal and equatorial ocean off Peru and Ecuador (Barber and Chavez 1983). The cessation of upwelling in the

Peruvian Current results in a disastrous decline in plankton, fish, and seabirds. The 1982–1983 El Niño was unusual both in its nature and severity (Philander 1983; Cane 1983; Rasmusson and Wallace 1983), which may account for the unprecedented nest abandonment

by millions of seabirds on Christmas Island (Schreiber and Schreiber 1983, 1984) and for my observations in Panama. Herein I report the first confirmed sightings of Inca Terns (*Larosterna inca*) north of Ecuador, a range extension of 1400 kilometers.

I recorded the first Inca Tern southeast of Panama City in the Bay of Panama (8°50'N, 79°20'W) on May 31, 1983, while aboard the Panamanian fishing trawler F. V. Yolanda. At 0830 hours CST, I saw a gray tern following the boat 30 meters astern and 10–15 meters above the water. As it flew alongside the boat a white, horizontal "mustache" was visible ventral to the eye. The rest of the bird's facial coloration—scarlet bill with a brilliantly-colored yellow base—was clearly visible through binoculars as the bird perched atop the net boom ten meters above me.

After the net was set at 1140 hours, five immature and five adult Inca Terns flew around the boat within 20 meters of the bridge and another 20 milled farther away from the boat. Both age classes possessed white trailing edges to their secondary feathers, but immatures were buff-colored and bore dark-brown mustaches. From a height of five to ten meters the terns swooped down at a 30–45° angle, flattened out briefly to pick up a sardine and then ascended to their original height. Approximately the same number of Inca Terns were seen flying around the boat two of the four times the net was set that day, but none was seen resting on the surface of the water. The species was observed in mixed-species feeding assemblages comprised principally of Brown Pelicans (*Pelecanus occidentalis*), Blue-footed Boobies (*Sula nebouxi*), Peruvian Boobies (*S. variegata*), and Olivaceous Cormorants (*Phalacrocorax olivaceus*). Similar seabird assemblages were observed around the other 14 vessels of this Panamanian fishing fleet.

As the following observations will attest, Inca Terns were widely distributed and present in substantial numbers in the Bay of Panama during the summer of 1983. On June 14 I saw many Inca Terns flying around the F. V. Yolanda as it headed east from Taboguilla Island, but halfway to Chepillo Island their numbers decreased. Seventy-seven Inca Terns were observed that day but some of them could have been following the boat and hence could have been counted more than once. I also sighted and photographed an immature Swallow-tailed

Gull (*Creagrus furcatus*), of which there is only one sight record for Panama near Piñas Bay (Ridgely 1981), between these two islands. Three days later, while aboard the Smithsonian Institution's R. V. Benjamin, I saw several Inca Terns between Balboa and the Perlas Islands. On the Perlas Islands of Pachequilla and Pacheca I observed and photographed approximately 10 immature and adult Inca Terns (Fig. 1). Four more Inca Terns were sighted at midday on June 27 on San Jose Rock located at the east side of the Pacific entrance to the Panama Canal. These observations of sizable numbers of Inca Terns 2000 kilometers north of their normal range coincides with the collapse of the Peruvian fishing industry in the Peru Current.

Inca Terns are birds of the Peruvian Current, but they are occasionally observed off the Galápagos Islands (Nelson 1968). Murphy (1936) reported the northern limit of their distribution as Lobos de Tierra and Aguja, Peru, but Meyer de Schauensee (1966) and Harrison (1983) extended their range north to the Gulf of Guayaquil, Ecuador. Ridgely (1981), in *Birds of Panama*, made no mention of *L. inca*. Reduction of cold-water upwelling along the Peruvian coast in 1983 caused a 20-fold decrease in phytoplankton biomass and productivity, which in turn resulted in the collapse of populations of the Peruvian anchovy (*Engraulis ringens*) and sardine (*Sardinops sagax*). Many of the seabirds likely responded to this collapse by long-distance dispersal, perhaps following prey-density gradients, to other sites of upwelling, such as the Bay of Panama. By April 1983 there were reports of many dead seabirds on Peruvian beaches (*ibid.*) attesting to the fate of the non-dispersing individuals. Inca Terns may be adapted for such events, as evidenced by Murphy's (1936) observations of sporadic movements of great numbers of these birds in what he believed to be response to a depletion in local food resources.

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