

# The Humboldt penguin in Peru

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Numbers of Humboldt penguins *Spheniscus humboldti*, which live on the coast and islands of Chile and Peru, have been declining since the mid-1800s. Extracting guano for fertiliser has damaged their breeding sites; they have been exploited for food and skins and captured for pets or zoos; they are incidentally caught in fishing nets and recent over-fishing may have caused a food shortage. The author surveyed the Humboldt penguins in Peru in 1981 and here discusses the conservation measures that are being taken.

Humboldt penguins are endemic to the area associated with the cold, nutrient-rich Humboldt Current which sweeps up the coast of Chile and Peru. During historical times their numbers have diminished, although no factual data are available to estimate the magnitude of the decline. Evidence for historical decline is based solely on anecdotal accounts. Murphy's (1936) *Oceanic Birds of South America* remains the primary source of information on the general biology of the Humboldt penguin. Even as early as the 1930s, Murphy mentioned the vast diminution of penguins on the islands of Peru. Because little is known of this species in the wild, a preliminary survey was initiated to assess the present distribution of the Humboldt penguin and to provide a



quantitative estimate of population numbers along the Peruvian coastline.

### Distribution and abundance

The range of the Humboldt penguin, as indicated by the literature, extends from islets off Algarrobo, Chile (33°20'S) northward to Lobos de Tierra, Peru (6°30'). However, I found a colony on Isla Foca (5°12'S), the northernmost island in Peru. I was not able to verify whether the birds breed there, although fishermen affirmed that they did. This discovery extends their northern distribution by 144 km.

Based on the survey and census data provided by Pesca-Peru, the Peruvian agency responsible for the protection and exploitation of the guano islands and mainland collection sites (guano points), Humboldt penguins are found on 17 of the 27 guano islands that they supervise. Population estimates for selected islands and mainland promontories based on personal observations (Table 1) and on census data provided by Pesca-Peru (Table 2) are presented. The numbers provided by Pesca-Peru are rough estimates and as such can only be used as an index of abundance. Personal observations are based on direct head counts when fewer than 100 birds were present, or on a count of the number of birds in an area multiplied by the estimated total area when more than 100 birds were present. At the 13 sites that I surveyed (Figure 1), a total of 2653 penguins were observed. These counts include penguins on roost rocks, in caves, and at sea. Caves were difficult to reach and could usually

only be entered when the sea was calm. As a result, the majority of cave counts included only penguins seen at the entrance. Moreover, these penguins are very timid creatures and will quickly flee when approached from a distance. One must also take into account that the colonies are subject to diurnal fluctuations in numbers. All of the above factors combine to produce an underestimate of numbers.

The largest rookeries were found at Punta San Juan and Pachacamac Island. The cave at Pachacamac offers natural protection from human poachers since there is no easy access by sea or land. At Punta San Juan, a guano point, guards protect the rookery from poachers. In fact, it was the only guano site where the main guard was found to have a keen interest in protecting wildlife. There is also a concrete wall built around

Table 2. Census of Humboldt penguins for nine guano islands and one mainland point provided by Pesca-Peru in 1981.

Locality	March 1981	July 1981	December 1981
Macabi Island	60	60	60
Mazorca Island	120	200	100
Chinchas Islands	10	—	26
North, Central, South			
Ballestas Island	8	—	15
La Vieja Island	0	0	0
Santa Rosa Island	0	0	0
San Juan	2220	—	5645
Pachacamac Island	750	650	435
Total	3168	910	6281

Table 1. Census of Humboldt penguins for 10 islands and three mainland points surveyed between July 7 and August 5 1981. A total of 2653 penguins was observed.

Date	Locality	Adults	Chicks	Juveniles	Total
July 1981	Sechura Peninsula*	68	8	5	81
July 1981	Macabi Island	56	6	10	72
July 1981	Mazorca Island	8	0	0	8
July 1981	Chinchas Islands	25	0	10	35
	North, Central, South				
July 1981	Ballestas Island	9	0	0	9
July 1981	San Gallan Island*	111	3	2	116
July 1981	La Vieja Island	8	1	0	9
July 1981	Santa Rosa Island	0	0	0	0
July 1981	San Juan	†	†	†	2000
August 1981	Atico	3	0	0	3
August 1981	Pachacamac Island	†	†	†	320

\*Not a guano collection site. †Present but not quantitatively estimated.

the promontory to safeguard the area from terrestrial predators—mainly the desert fox *Dusicyon sechurae*. Due to these protective measures, the Humboldt penguin appears to be proliferating in these two areas.

A conservative estimate of the population in Peru consists of 4500–6000 Humboldt penguins. Data from monthly censuses by biologists at the Paracas National Reserve from 1976 to 1980, for a cave inhabited by penguins, suggest an overall decrease in population size. Trend data are not available for other colonies. However, these may be affected by the same unknown factors and may also be declining.

### Nest sites and predators

Humboldt penguins breed on offshore guano islands and along the undisturbed mainland.

They nest in burrows, caves and natural crevices, among fallen boulders and occasionally in exposed sites. The population inhabiting the Sechura Desert coastline (6°S) nests only in naturally protected areas. The population at Punta San Juan (15°21.6'S), however, utilises exposed nest sites in addition to caves and burrows, maybe because it is cooler; the incident radiation is higher at 6° latitude than at 15°. Other factors for the surface nesting could be protection from terrestrial predators (by the wall) and nature of the terrain.

The penguins seem to have traditional roost rocks where they are found in association with guanay cormorants *Phalacrocorax bougainvillii*, Peruvian boobies *Sula variegata* and Peruvian pelicans *Pelecanus thagus*. In caves and on beaches they are found with sealions *Otaria*

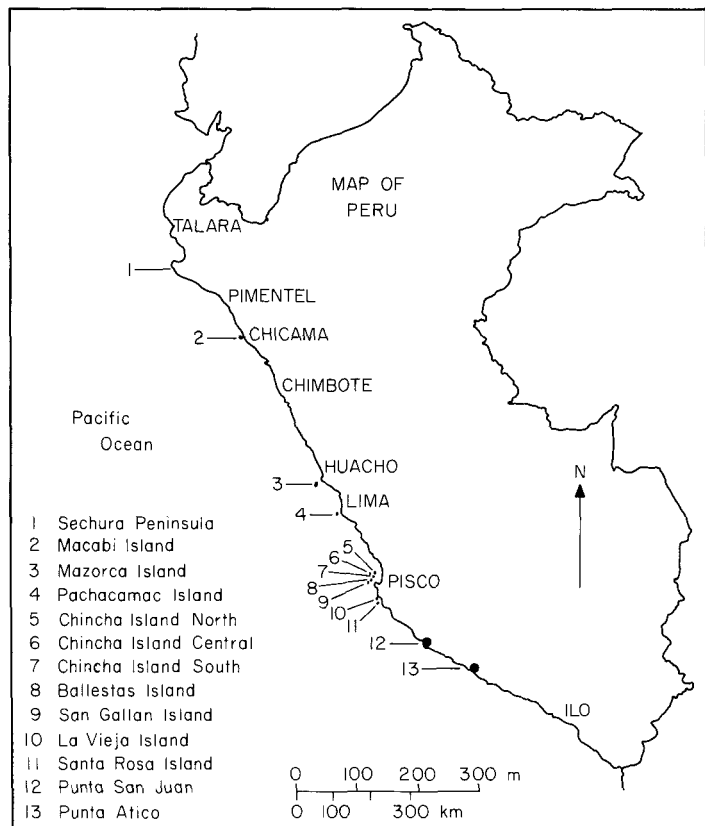


Figure 1. Areas surveyed in 1981 for Humboldt penguins along the Peruvian coastline.

*flavescens* and fur seals *Arctocephalus australis*. At Pachacamac island, red-legged cormorants *Phalacrocorax gaimardi* nest on the periphery of the Humboldt penguin colony.

The Peruvian gull *Larus belcheri* preys on unguarded penguin eggs and possibly on chicks. The kelp gull *Larus dominicanus* probably also feeds on penguin eggs and chicks. I found the desert fox to feed on the juveniles. Sealions and fur seals feed on other species of penguins, although I have no evidence that they kill Humboldt penguins (Spellerberg, 1975). However, I have observed sealions chasing penguins in the water and charging at them on land.

## Causes of decline

The initial decline of the Humboldt penguin population began in the mid-1800s with the intensive and destructive exploitation of the guano islands of Peru. Guano was removed for use as a fertiliser, thus precluding its use by the penguins for burrowing. This disruption of their breeding habitat represented a long-term change that decreased nesting quality, and consequently had a negative impact on their breeding success.

In the past, fishermen took penguin eggs and killed the birds for food, oil and skins. Fishermen still kill penguins for food and they are sold covertly at some market places. Young are also taken to raise as pets or, eventually, to be eaten. Incidental catches in fishing nets have also taken their toll, especially during the 1960s and early 1970s, when Peru was a world leader in the fishing industry. Moreover, the overfishing which has occurred in recent years has probably created a food shortage. An additional factor that has contributed to the decline of the Humboldt penguin has been the exportation of live penguins to foreign zoos (Koepcke and Koepcke, 1963). Export data are available for a 32-year period (1939–41, 1946, 1950–78) during which 9264 penguins were exported. One must consider that this does not include penguins that died during capture or in transit. In any case, the total number of penguins exported exceeds the present population estimate.

## Conservation measures

In September 1977, the Peruvian government, *Humboldt penguin in Peru*

through a Ministerial Resolution, classified the Humboldt penguin as a vulnerable species that may become endangered because of excessive hunting, habitat destruction, and other factors. Article 30 of the Ordinance for Conservation of Flora and Fauna prohibits subsistence, sport, or commercial hunting of the guano birds, including the penguin. In addition, Article 12 of the Ordinance prohibits exportation and hunting of protected species except for scientific research or educational purposes. This prohibition of the legal exportation of live penguins has thus safeguarded at least 500 penguins annually. Moreover, in 1981, the Humboldt penguin was listed in Appendix I ('endangered' status) of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, which prohibits international trade. In spite of the good intentions reflected in the regulations, additional enforcement is necessary.

Extensive research into the natural history of the Humboldt penguin is a prerequisite for the development of an effective management plan. The ultimate goal is to maintain and, eventually, to increase the present population levels of these penguins. Additional surveys of the Humboldt penguin will be undertaken in 1983.

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