

## Green Scene: The Value of Bird Poop

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Guano, a word derived from the ancient Quechua language of Peru, is the term generally used to describe seabird droppings. The indigenous people of Peru who farmed on relatively poor soil on the Andean slopes developed a great appreciation for the nitrogen-rich guano on which they relied as a fertilizer to grow crops. They harvested guano from islands off the dry coast of Peru and, with the help of their only beast of burden, the llama, carried the guano to their terraced fields high in the Andes where rainfall is more abundant.

The source of this guano came from the millions of seabirds which nest on rocky volcanic islands including the Ballestas which are just off the coast of Peru near the Paracas peninsula. Sometimes referred to as Peru's proxy for the Galapagos Islands, the Ballestas support amazing numbers of nesting seabirds as well as sea lions and seals. These birds include the three major guano producers, the guanay cormorant, the Peruvian booby and the Peruvian pelican. Less common seabirds include several other cormorant and booby species, the beautiful Inca tern and the endangered Humboldt penguin.

Standing about 70 cm high, Humboldt penguins nest on the rocky Ballestas Islands of Peru if they can find areas suitable for digging burrows.  
*B. Brandhorst photo.*



Prior to being harvested commercially in the mid-19<sup>th</sup> century, this guano was reported to be up to 50 meters thick in places on these islands. Lack of rainfall along the coast ensures the

valuable nitrogen is not leached from the guano. There was so much guano – and it became so highly valued as a fertilizer- that imports to Britain, France and the USA allowed the Peruvian government to pay off its foreign debt. Although synthetic fertilizers replaced the use of guano early in the 20<sup>th</sup> century, it remains a sought-after organic soil amendment.

However, the harvesting of so much guano had devastating impacts on the seabird populations. These birds used this pungent clay-like material to construct nests which protect their eggs on rocky ledges. In

particular, the Humboldt penguins dig burrows into the guano where they lay their eggs. The population of these penguins was estimated to be over a million in the mid-19<sup>th</sup> century but, today, only about 5000 remain in Peru. Even the much more abundant guanay cormorants have also suffered severe population declines. Once thought to number around 35 million, their population has now decreased to about 1 million. Currently, these cormorants as well as the Peruvian booby, the Peruvian diving petrel and the red-legged cormorant are listed as threatened species. Following the example of the Incas who made any disturbance to the guano-producing seabirds a capital offence, the Peruvian government has, with limited success, established measures to protect these birds and their nesting areas.

All these seabirds are attracted to the Peruvian coast by the bounty of small fish, mainly anchoveta, that swim in the productive cold waters of the Humboldt Current which sweeps up this coast from Antarctica. Upwelling coastal waters in Peru provide an extremely rich source of nutrients that forms the basis of a food chain that supports one of the richest fisheries in the world. Sadly, guano harvesting is not the only negative impact that people have on the nesting seabirds. Since the 1950s, these birds have had to compete with a now well-established commercial fishing industry also in pursuit of the anchoveta. Most of the caught anchoveta are converted to oil and fishmeal which is then fed to chickens and farmed salmon. Now, at least, there appears to be a more sustainable trend to use the anchoveta directly as food for people.

There is one other important determinant in the survival of these Peruvian seabirds - El Nino. Every few years during an El Nino event, the trade winds falter and the upwelling ceases along the coast of Peru. The waters warm and the anchoveta undergo precipitous declines in numbers. With their food source much diminished, seabird populations can be decimated. In 1972, there was a strong El Nino and the anchoveta declined in numbers along with the seabirds. However, anchoveta fishing continued unabated. That led to a collapse of the anchoveta which, for a time, were replaced by sardines. Today, the anchoveta have returned but, due to continuing fishing pressures, the populations of the seabirds who feed on them remain precarious.

The story of these guano-producing seabirds should remind us of the poor job we often do in sharing the resources of the planet with other species. We need to be taking their requirements into account and, also, making allowances for events such as unusual weather patterns that cause natural but dramatic fluctuations in their populations.