

RECOVERING THE GALAPAGOS

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Far out in the Pacific Ocean off the coast of Ecuador, a battle is being fought. It is a battle to ensure that native species (under pressure by man's introduced species) will survive. The battleground is the Galapagos Archipelago. At threat are indigenous species, thousands of years old. Their only defence — isolation — an isolation that is no longer total.

Pigs and dogs hunt the tortoise and iguana; rats, cats and dogs, brought by passing ships and settlers (and now running wild) decimate rare bird populations — donkeys and goats compete for grazing and in the process starve out native species. Trees introduced by settlers quickly take-over from indigenous species. The situation poses the greatest threat to species survival yet seen in the Galapagos Islands.

One hundred and fifty years after the Galapagos Islands inspired Darwin's views on natural selection and thousands of years after they became home to some of the rarest species in the world, man is once more interfering with the process of natural selection. This time he hopes to set right the mistakes of those who came before.

Sailing ships first brought rats and domestic animals. Later, settlers abandoned their homes and turned loose their domesticated animals. Now, park rangers hunt the animals as a matter of course, to ensure native species can survive.

In fact introduced species and feral animals have become such a threat in the Galapagos that those topics took up much of the discussion time of the Charles Darwin Foundation when it met recently at the World Conservation Centre in Switzerland.

The severity of the problem is best illustrated by an example. In the mid-1960's authorities counted fewer than half-a-dozen goats on Pinta, one of the chain of Galapagos Islands. There was immediate concern. Over the years animal control officers hunted the goats but were never quite able to wipe them out. This year, authorities of the Galapagos National Park Service (GNPS) finally think they have rid the island of the goats. Over the years they have killed 40,000 of the animals; all offspring of the first half-dozen goats. Vegetation on the island is recovering and Pinta Island may soon again be safe for species previously doomed to starve in competition with the voracious appetites of goats.

On Isabela (Albermarle) Island dogs and pigs attack tortoises and last year park authorities reported two tortoises killed by poachers. Land iguanas too remain at threat. Scientists say there is little point in returning them to islands as expensive cat food. Captive-bred iguanas are now being held until they are older in the hope they can defend themselves against these predators.

Scientists say that in 1984 the Galapagos race of Petrel, *Pterodroma phaeopygia* has been threatened by rats, despite poisoning campaigns, at the breeding colony on Floreana. With the rat population controlled 72 chicks hatched from 100 eggs but in 1985, a drought severely cut back the rat population. Rejoicing proved premature. Cats, apparently deprived of their normal diet of rats and mice, invaded the petrel colony. A conservation team killed 64 cats but only 23 chicks survived and some adults were killed in the nesting area.

The future of the Galapagos Penguin and the Flightless Cormorant has also caused anxiety, firstly because of an invasion of wild dogs and secondly because of a drastic reduction of both populations by starvation during the 1982-83 El Niño, when a rise in sea temperature severely affected the food supply of all seabirds.

A dog eradication program has brought the cormorants back to their pre-Niño numbers while the penguin's recovery is proceeding more slowly. These two birds, of all those in the Galapagos, remain a cause of special concern for three reasons, they cannot fly, their habitat is very restricted, and there are so few of them. The fact that they exist after El Niño has demonstrated their capacity to survive the most severe natural disaster, but scientists say they must be given constant protection against changes induced by man and particularly against the feral animals man has introduced.

Only a few fortunate islands remain completely free of alien animals. Black rats are probably the most widespread and most intractable invaders. On tiny islets such as Mosquera, Venezia or Pitt, eradication has been possible but there is no guarantee against renewed infestation.

Charles Darwin Foundation vice-president, Ole Hamann, says the recovery of Pinta Island after the eradication of 40,000 goats is "spectacular" with vegetation recovering and erosion halted but Santiago Island, with its 100,000 goats and 20,000 pigs, is a much more serious problem. "Even if there were money available," he says, "the logistics of eradication of such numbers of animals on a large, rugged and waterless island, are alarming." Nonetheless in 1985 a program did begin concentrated on killing the pigs which prey on marine tortoises. It is a beginning, but Dr Hamann says the campaign must continue for years.

Domesticated animals turned into the wild are also a threat to indigenous vegetation and botanists are concerned about an invasion of another type. Introduced plants from farms outside the National Park's boundaries — transported by wind and straying cattle — are competing with indigenous species. The struggle against introduced trees and plants continues year by year. Some can be killed by poison, others must be dug-up with shovels. Botanists are now experimenting with herbicides.

The Charles Darwin Research Station has co-operated with the Plants Conservation Programme of the International Union for Conservation of Nature and WWF, to prepare a botanical plan with particular emphasis on forestry problems. Organizers hope to raise funds for continued research on botany, plant ecology and forestry management.

There is one other area now garnering attention from both the Galapagos National Park Service (GNPS) and the Ecuadorian government. Traditionally sperm whales and fur seals have suffered from exploitation in the region but conservationists point out that many land species too are ultimately dependent on the ocean's resources for their survival. Moreover, owing to the fact that the archipelago is situated at the conjunction of the great Eastern Pacific currents, the ecology of its waters is unique, and biologists speculate that underwater resources may prove to be even more important scientifically than terrestrial areas.

President Leon Febres Cordero, of Ecuador has proposed the creation of "a marine reserve to be incorporated in the Galapagos National Park," but whether this year sees the introduction of such a reserve or not, scientists everywhere will continue to view the area as the greatest repository of original species in the world. However, the region's major contribution to the knowledge of man may not be as nature's classroom and storehouse of natural history but rather as a reminder that the earth is a fragile place easily threatened by man and the plants and animals that sustain him.