

about to start at the CDRS, financed by the Fondo Ecuatoriano Canadiense para el Desarrollo (Ecuadorian-Canadian Development Fund). Concern is growing in the DPA (Dirección Provincial Agropecuaria/ Provincial Land & Livestock Administration). For example, the Undersecretary of the Ministry of Agriculture recently prohibited the introduction of a new grass for the soccer stadium of Puerto Ayora. The beginning is very slow but it is all we have for the moment. Unfortunately, this is just like a drop of water in the ocean.

There is an urgent need for a broad-scale program and financial support for it. Too many international agencies are interested in "development" projects for Galapagos and quarantine must be fully supported by those agencies promoting it. If we can't work out a solution immediately, these agencies are directly responsible for the rapid acceleration in the destruction of the "natural Galapagos". Quarantine is a system of regulations that must move parallel to the development, and it must be supported.

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## WHAT IS HAPPENING WITH THE AVIFAUNA OF SAN CRISTÓBAL?

by: **Hernán Vargas**

The island of San Cristóbal has produced various endemic taxa of birds, perhaps due to geographic isolation and its relatively old age. The Chatham mockingbird (*Nesomimus melanotis*), is an endemic species and other birds like the vermilion flycatcher (*Pyrocephalus rubinus*), large-billed flycatcher (*Myarchus magnirostris*), woodpecker finch (*Camarhynchus pallidus*), small tree finch (*Camarhynchus parvulus*), cactus finch (*Geospiza scandens*), warbler finch (*Certhidea olivacea*) and the lava heron (*Butorides sundevalli*) have developed subspecific characteristics which appear distinct from the populations on other islands.

The first recorded observations of the birds of San Cristóbal were made by Charles Darwin in 1835. It was in 1832 when the Ecuadorian government initiated colonization of Galápagos, and humans began to influence the natural populations of the island. Horses, cattle, burros, goats, pigs, dogs, cats, chickens and plants such as coffee and sugarcane were part of the colonization process as were the accidental arrivals of rats and mice. In the years which followed the flow of exotic introductions increased and some species like guayaba, oranges, blackberry grew well and they soon became plagues.

During April of this year, I made a trip to observe the birds on San Cristóbal with the idea of determining their actual status. I spent eight days looking for birds in many

places in the various upper and lower zones of the island. Unfortunately, some of the species, common in the past were not observed at all on this trip while other bird species are apparently less abundant than ever before. For example, I did not see the vermilion flycatcher (*P. rubinus*), the large tree finch (*Camarhynchus psittacula*), the Galápagos rail (*Laterallus spilonotus*) or the Galápagos dove (*Zenaida galapagoensis*). Perhaps the situation is most critical for the vermilion flycatcher, whose presence was last noted 9 years ago during 1987 in the area of the highland lake, El Junco (J. Gordillo, pers. com.).

The Chatham mockingbird, Hawaiian petrel and the cactus finch are among the species whose populations apparently have suffered alarming reductions. I observed a few mockingbirds on various parts of the island but their numbers seemed greatly reduced in areas such as Puerto Baquerizo Moreno. The Hawaiian petrel (*Pterodroma phaeopygia*) still survives in low numbers (10 - 20 pairs have been found) but these nest in only in a few gullies of the humid zone. The cactus finch was found in only one place, an isolated forest of *Opuntia* cactus (*Opuntia megasperma*). This site consists of no more than 20 hectares of cactus on the south-west side of the island near another area called Veinte Varas (20 Staffs).

These observations and others, indicate the avifauna populations have apparently been greatly reduced and

some populations of birds may be on the verge of extinction. Given the grim nature of my findings, I will be delighted to receive reports of sightings of the birds which I did not record.

In the past 161 years, San Cristóbal has suffered the extinction of the Galápagos hawk (*Buteo galapagoensis*), the sharp-billed ground finch (*Geospiza difficilis*) and probably the large-billed ground finch (*Geospiza magnirostris*). At this point we are unable to list any others with certainty.

What are some of the causes of these faunal extinction's and declinations? In the case of the hawk, man is the direct cause. For the others, surely the introduced organisms are playing leading roles. The introduced black rat (*Rattus rattus*) can eat the eggs and chicks of ground nesting birds such as the Hawaiian petrel, Galápagos rail, Galápagos dove, and the storm petrels. Actually the band-rumped storm petrel (*Oceanodroma castro*) and the wedge-rumped storm petrel (*Oceanodroma tethys*) now nest safely on Isla Pitt (a half mile off of the northeast coast of San Cristóbal) where the rats were eradicated a few years ago by Galapagos National Park Service and Charles Darwin Research Station personnel. From what has been reported elsewhere, donkeys appear the principle cause in the reduction of the *Opuntia* cactus, possibly a vital ecological base of both the cactus and the large-billed ground finches.

The known diseases which arrived with introduced animals include Avian Pox and Crop Canker (*Trichomanes gallinae*) and these have been known to reduce populations of native and endemic birds. It is very possible that the domestic pigeon (*Columba livia*) and the chicken (*Gallus gallus*) were carriers of these diseases which affect the endemic dove and other terrestrial birds. At this time there are nearly 500 free-ranging domestic pigeons on San Cristóbal. They live principally around the human settlements but fly out into the adjoining areas facilitating the spread of any new disease or parasite which arrives as new domestic animals are brought to the islands.

During the April surveys I was informed of the existence of two or three parrots that had been introduced. I

do not know if these are one or more species, but they live in a semi-wild state flying between the urban zone of Puerto Baquerizo and the National Park much like the pigeons. I observed one of these parrots on April 21, 1996 just south of the town and identified as the Red-masked parakeet (*Aratinga erythrogastra*). Ironically, this is an endangered species on continental Ecuador.

The blackberry vine (*Rubus niveus*), the guava (*Psidium guajava*) and Pomarosa (*Eugenia jambos*) have invaded extensive areas of the agricultural zone and have begun to invade National Park land. The rapid expansion of these and other introduced plants along with the habitat alteration of the agricultural zones are causing a reduction of the native floristic diversity and thus altering the habitat for the native and endemic birds.

Introduced insects and their ecological impacts have hardly been studied in Galápagos and their influence on the whole of San Cristóbal is probably graver than we can even imagine. An illustrative example is the propagation of a scale insect along the coast where it had not been noted previously. This insect was initially reported around Puerto Baquerizo Moreno on *Parkinsonia aculeata*. On this trip it was found on *Prosopis juliflora* at the site called Veinte Varas; on *Cordia lutea*, and the two endangered endemic plants of *Lecocarpus darwinii*, and *Calandrinia galapagosa* at Cerro Colorado and on *Scaevola plumieri* at Bahía Sardina and Punta Pitt. The scale appears to be causing mortality in the plant *S. plumieri* at these last two sites. This recent survey shows the problem of the scale insect to be very widespread on San Cristóbal.

We may be at the point of witnessing one of the biggest losses of bird diversity on an island in the Galápagos to date. If the trend continues, first there will be the loss of specific island populations of birds (like those of San Cristóbal) and later the entire species. Without studies and probable conservation measures, it is just a matter of time.

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## SCALESIA ATRACTYLOIDES: ONE BITE FROM EXTINCTION

By: André Mauchamp

*Scalesia atractyloides* Arn. vars. *attractyloides* and *darwinii* (Hook F.) Eliass., is an Asteraceae endemic to Santiago last seen in 1990 on 2 small craters of the west coast (Adersen pers. com.). *Capra hircus* L. (commonly known as a goat) is a mammalian herbivore that originates from the mideast and can be seen throughout the world where it reproduces almost as fast as rabbits (unpub. observa-

tion). Santiago is one of the central islands of Galápagos, north of Santa Cruz. It measures 585 km<sup>2</sup> and its native and endemic vegetation totals 318 species. It has very few introduced plants, and none of them are invasive. Unfortunately the above mix is not compatible when goats are added to the island.