Invasive Species: Goats, Fire Ants, and Guavas

It is quite obvious that the “exotic” human species has been the most destructive species that has ever invaded the Galápagos Archipelago. As a species, we have exploited the wildlife and damaged the ecology irreparably - sometimes passively, sometimes intentionally.

Unfortunately, since their discovery in 1535, the Islands have been regarded as a wilderness “free-for-all” area. Early settlers, sailors, whalers, and farmers cleared vegetation for cultivation and pasture and brought goats, cattle, and donkeys. Although these domesticated animals were first introduced in small numbers to the Galápagos, it was estimated that by the 1980’s there was a population explosion of goats in the range of 125,000 on Isabela alone. Furthermore, the presence of these domesticated animals has had catastrophic effects on the native species of the Galapagos. In fact, goats, donkeys, and cattle began feeding on the native plants and quickly began to deplete and, thereby, change the food source that the reptiles depended on. Goats and pigs that escape into the wild, “wipe out, not only food sources, but also foliage that shades temporary rain pools and regulates temperatures crucial to reptile egg development.”

One of the saddest examples of habitat depletion caused by the feral goats is the reduction of plant foliage available for the giant tortoises, which inhabit the Volcano Alcedo on the Island of Isabela. In addition, feral goats there have stripped the bark off trees, which then died, and, as a result, the forests that once covered the southern slopes of the volcano are now small patches. As endemic and native species and subspecies disappear, land erosion occurs and microclimate changes, which in turn affect the ecosystems of the Islands.

The impact of goats on Isabela, Santiago, Santa Cruz, San Cristobal, and Baltra is so catastrophic to the native species of flora and fauna that feral goats, along with feral pigs, feral cats, black rats, fire ants, and other invasive species have been placed on the “Most Wanted List” for Complete Eradication. The UN, the World Bank, and other agencies allocated more than $18 million dollars in 2002 to begin a 6 year long project, in which sharp shooters, radio-collars, trained dogs, and fenced areas are used to control and eventually eradicate these invasive pests from the Islands. As a result, goats have been eradicated from form smaller and medium sized islands such as Espanola, Santa Fe, Rabida, Marchena, South Plazas, and Pinta.

But domesticated animals turned feral are not the only animals our species has introduced to the Galápagos; as settlers, farmers, entrepreneurs, and tourists continue to arrive, more invasive species are introduced. Such is the case of the little fire ant and the tropical fire ant.

The little fire ant, Wasmannia auropunctuata (Roger), is believed to have arrived in the Galápagos between 1910-1920. According to scientists, it is considered the “most aggressive species that has been introduced into the Archipelago” because it does not coexist with other ants of other species. In fact, scientists have also noticed that there is a considerable reduction of spiders, scorpions, and native ant species in areas infested by the little fire ant. In particular, its invasion of 18 hectares in Marchena is considered a threat to the nests of masked boobies.

And, although the little fire ant first settled in Santa Cruz, it has since been found on San Cristobal, Isabela, Floreana, Santiago, Santa Fe, Pinzon, and of course, Marchena. It is believed that the little fire ant arrived to the large islands on plants and soil meant for nurseries and gardens and arrived to the small islands in camping equipment and provisions. However, as tourism and immigration to the Islands increased, so did the transport of the little fire ant. As shipped goods are transferred to the arid highlands, the little fire ants that are usually found in humid areas travel along in the cargo and establish settlements in these otherwise arid areas where humans have brought humidity in the form of sprinklers and other water sources.
Another invasive ant that was introduced by humans and who has plagued the Galápagos since the early 1900’s is the tropical fire ant, *Solenopsis geminata* (Fabricius). Although it is believed that the dispersal centers for *S. geminata* are urban and agricultural areas, as well as the volcanoes of southern Isabela, tropical fire ants are now also found on Santa Cruz, Floreana, and San Cristobal. According to scientists and researchers, *S. geminata* is a voracious feeder of invertebrates and may have an impact on the nesting behavior of land iguanas and tortoises.

Unlike the *W. auropunctuata*, who do not rely on winged queens to form new colonies and who instead expand by connecting their satellite colonies, the *S. geminata* establish and expand their colonies by winged females capable of flying over large distances. This is believed to hinder their control because their colonies are scattered and not extensive as has been found in the case of *W. auropunctuata*, who distribute their colonies over hundreds of hectares. However, because *S. geminata* fly, they pose a great threat to native and endemic species since winds (especially during El Niño years) make their arrival to other islands a lot easier. In fact, there is growing concern that the tropical fire ant’s presence in the Mariela Islets may also have an impact in the nesting behavior of penguins.

Consequently, because both types of fire ants are considered highly threatening to the native and endemic species of the Galápagos, they have both been targeted for eradication. Eradication programs include non-selective ant poisons and brush clearing. However, it is quite understood that complete eradication will be easier in the smaller islands since the little fire ant was already successfully eradicated from Santa Fe and repopulation of endemic ants that had previously been displaced has been observed. But eradication will be quite a challenge in the larger islands where the ants have enormous infestations and where humans import “humidity”. In addition, El Niño years will continue to pose a challenge since the high levels of precipitation stimulate rapid vegetation growth and therefore increase insects and decomposers available for the voracious eaters.

As part of introducing invasive species, human presence in the Galapagos has also contributed to the importation of invasive plants. According to scientists, beginning with the discovery of the Archipelago in 1535, about 600 species of alien plants have been introduced, which unfortunately means that alien species now outnumber the 500 native species.

Although some invasive species were taken primarily for cultivation, some were taken for gardens, and some were taken unintentionally. Furthermore, because invasive and exotic plants often have “life history traits such as large and frequent seed crops and short times to reproductive maturity” these traits provide an advantage over the endemic and native plants. Some of the ten most aggressive imported plants living in the 4 human-inhabited islands are grass, quinine trees and guava trees. *Psidium guajava* (guava), in particular, has become a major challenge because woody guava trees are drought resistant and therefore can invade just about anywhere and replace native trees and shade out smaller plants underneath. In fact, it is feared that because the endemic *Scalesia* trees die out in record numbers during El Niño years, that this species will never recover to its average population prior to 1997. Instead it is predicted for the introduced guava tree to prevent its re-growth. Imported guavas are also difficult to eradicate since seedlings are dispersed by wind and can remain in the soil even after the tree has been removed. Moreover, as goats and cattle are completely eradicated, guavas thrive, since there is no longer an herbivore to damage it; the remaining grazers and consumers can eat its seedlings and damage its saplings but they cannot reduce its number of trees. Sadly, due to the lack of funding and the necessary on-going task to eradicate the invasive guava, the reality is that the introduced guava may never be completely eradicated from the Galápagos.

So, it appears that as long as human beings continue to admire and exploit the pristine beauty of the Galapagos, endemic and native plants will continue to be threatened with extinction. Fortunately, the increased funding for educational, quarantine, inspection, and eradication programs, in addition to the limitations of immigration to the Galapagos, can provide some hope to those of us who are saddened by
the ecological disasters that we have imported. And fortunately, 97% of the Galápagos Archipelago is still protected.

Bibliography


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