



TRAVELOGUE

Decline and Rise of Galápagos Tortoises

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Photographs by the author.

A few million years ago, some South American tortoises wound up in the ocean, possibly washed out to sea by floodwaters. Once there, they tucked in their heads and feet and patiently floated, either à la carte or on rafts of vegetation. Eventually, a few fortunate individuals struck land in the Galápagos, where they crawled ashore, found a snack, settled

in, and multiplied — with those on each island adapting to local conditions.

This is the best scientific hypothesis regarding the origin of the 14 distinctive populations (frequently recognized as separate subspecies) of Galápagos Giant Tortoises (*Chelonoidis nigra*) that evolved in the archipelago. These volcanic islands,



Giant tortoises eat hard-to-digest grass, which quickly comes out the other end, only partially digested and still recognizably grassy.

1,000 km west of the Ecuadorian mainland, were named by 16th-century Spanish explorers (*galápagos* = tortoise) and were never connected to another land mass.

Although the ancestors of some island populations might have arrived separately from South America, the origins of some are the subject of considerable speculation. One explanation for their presence on the islands of Santa Cruz and Isabela involves a distressed 19th-century ship. “We cannot prove, but what might have happened, is that boat was collecting giant tortoises on different islands,” said Orlando Romero, a naturalist with the Galápagos National Park Service. “Maybe the ocean was very choppy and the boat was full of tortoises and water was coming in, and maybe they decided to dump giant tortoises from different islands.”

If you’d enjoy speculating with naturalists about tortoises and other fauna, a Galápagos cruise might be right for you. I was fortunate to spend a week in late January on the *Letty*, a 20-passenger ship owned by the Ecuadorian company Ecoventura. The *Letty* is not for people who want cruise ship amenities like pools, casinos, and gift shops. Instead, she provides a dining area and sun deck for socializing with shipmates, a small library focused on the Galápagos, and a briefing area where every night the naturalists explain the islands’ history.

Our group had two guides. Orlando Romero, who came to the islands from mainland Ecuador in 1974, and Ivan Lopez, are very experienced and knowledgeable naturalists. Since some passengers were content to admire the scenery and, in fact, snoozed during the briefings, both Orlando and Ivan were eager to answer any questions by those interested in the nitty gritty of animal behavior.

Travails of Humans and Animals in Centuries Past

Before the Galápagos National Park was established in 1959, the remaining Galápagos animals had survived a few centuries of anything goes. Human contact had doomed some species to extinction.

Pirates, whalers, and buccaneers plied these waters until Ecuador claimed the Galápagos in 1832. Among other things, the islands initially served as a penal colony and a sugar plantation, and — if you believe all the stories the naturalists tell — as a potential site for a 19th-century nudist hotel.

The islands, stark and isolated, have never been an easy place to live. Stories of scandal, danger, adventure, murder, violence, and mystery abound. Romero once got lost for three days on the island of Santa Cruz. When he finally found a pond, the water wasn’t entirely fresh; he had to strain it through his T-shirt to avoid drinking the feces of a giant tortoise.

Giant tortoises were especially hard hit by early visitors. Since tortoises can live for up to a year without food or water, sailors stacked living turtles in the holds of ships, killing them for fresh meat during their voyage. Merchants harvested tortoises for fat, which lit streetlights on mainland Ecuador and



Whalers heading for Antarctic hunting grounds stacked living turtles in the holds of ships, killing them for fresh meat during their voyage.

other parts of South America. In the later 1800s, scientific expeditions routinely killed tortoises, drying their skins to take home as research trophies.

Before these slow-moving reptiles encountered humans, they may have numbered 250,000. Now the total population in the Galápagos is closer to 25,000. Giant tortoises of the Seychelle Islands in the Indian Ocean were similarly exploited. Those on Aldabra (*Aldabrachelys gigantea*) have recovered thanks to an unusually long history of conservation efforts, but subspecifically related forms on other islands in the Seychelles were thought to have become extinct until 1999, when 12 individuals surviving in captivity were shown to exhibit characteristics of the “extinct” forms. The latter are now the subject of a captive breeding and reintroduction program by the Nature Protection Trust of Seychelles.



Lonesome George, the world’s last Santa Cruz Island tortoise, lived at the Charles Darwin Research Station until his demise in 2012.

Breeding Giant Tortoises

Since 1965, the national park has collaborated with the Charles Darwin Research Station (CDRS) on a giant tortoise captive breeding program. The station on Santa Cruz Island is where Lonesome George, the world's most famous tortoise, lived until his demise in 2012. As far as anyone knows, George, a Pinta Island tortoise, was the last of his kind.

My group visited the research station on a pleasant Thursday morning. A few clouds hung in the sky as we strode pathways between giant prickly pear cacti, a tortoise favorite. Santa Cruz was the lushest island we visited; some are as stark as moonscapes. We also saw the first buildings we'd seen since boarding the boat on Sunday, and the first souvenir shops.

Ten of the 14 distinct populations of giant tortoises are extant. Half of these hail from the island of Isabela, where a different form evolved on each of the island's five volcanoes. Tortoises are dome shaped, saddlebacked, or in between, depending on their home island's vegetation. In places with plenty of food on the ground, grazing dome-shaped tortoises

thrive. On the extremely dry island of Española, a saddlebacked variety developed in order to reach plants as much as a meter above the ground. Regardless of form, the tortoises keep growing until they die, albeit it at increasingly slower rates as they age.

Even with humans mostly minding their manners on the islands these days, other creatures still pose threats to tortoise survival. Black Rats (*Rattus rattus*) — hitchhikers inadvertently introduced long ago — eat tortoise eggs, as do pigs. Introduced cats, dogs, goats, and endemic Galápagos Hawks (*Buteo galapagoensis*) feast on hatchlings.

Tortoises lay seven or eight eggs in a clutch, bury them, and move on. After leaving them in the nest for a couple of months, scientists dig them up and transport them to the research station. They learned by trial and error to mark the tops of eggs, because failing to maintain the egg's original position means death for the embryo. In the old days, Romero said, "They were not very careful. They were taken by boats, sloshing the embryos." Now the islands of Isabela and San Cristóbal have their own breeding programs, so those eggs are moved shorter distances.

Once at the research station, eggs are sorted by island and incubated. Since temperature dictates whether hatchlings will be male or female, scientists decide which would be more advantageous for the population. Once the eggs hatch, the tiny hatchlings — soft-shelled and the size of tennis balls — are put in dark boxes for a month to simulate the time they'd spend underground in the wild. Then come two years in a small enclosure, followed by three to six years in a larger, more natural area. Visitors can see these little guys, who don't look like they're going to grow into the giants they become.

All hatchlings' shells are color-coded by island, and each individual is micro-chipped and assigned a number. When their shells are 20–25 cm long, scientists release the young tortoises into the wild. This happens during the rainy season, when the fruits and flowers on which the young tortoises depend are most abundant.

The breeding program has been especially successful on the island of Española. In the 1970s, the outlook was bleak for Española tortoises. Only two males and twelve females wandered the island, not bumping into each other frequently enough to breed. Scientists brought the Española tortoises to the research station, where they seemed content to live comfortable lives as singles. In fact, they didn't even seem to know how to breed. The scientists decided they needed another male to stir up some healthy competition.

The San Diego Zoo had the tortoise for the job. Zoo officials agreed to repatriate their Española tortoise, which the zoo had collected nearly 50 years earlier. So, in 1977, he flew home to the Galápagos on a United Airlines flight.

Lopez likes to tell the story in his typically racy fashion. "He was named Diego — or Professor Diego, because he had



Hatchlings at the breeding center reside for a month in dark boxes (top) to simulate the time they'd spend underground in the wild — then come two years in a small enclosure (bottom).



In the 1970s, only two males and twelve females wandered the island of Española. Diego, repatriated from the San Diego Zoo, triggered a mating frenzy. The research center has since sent 1,700 tortoises back to Española.

a book under his arm and he said, ‘Come on, babies, I’m going to teach you.’”

Apparently Diego’s tortoise Kama Sutra had all the right moves, because soon everyone was mating. The research center has since sent 1,700 tortoises back to Española. Diego himself, now about a century old, still resides at the research center. Visitors can watch him relax in his private pond.

Unfortunately, the story of Pinta tortoises is not so happy. In 1971, a botany student found George on Pinta, where tortoises were thought to be extinct. George was relocated to the research center. Scientists tried in vain to interest George in similar tortoises of the opposite sex. One intrepid scientist even worked one-on-one with George on a program of manual stimulation, but ultimately her efforts bore no fruit.

Despite George’s death, scientists still haven’t given up. Hopes now hinge on identifying living Pinta tortoises in zoos and other private collections around the world through DNA testing. If scientists find the right DNA, they might try to bring those tortoises back to the Galápagos and recover the Pinta population.

Visitors to Santa Cruz can see George’s former residence and a plaque commemorating him. In the future, his body might be mounted and displayed.

Visitors to the station also will see Galápagos Land Iguanas (*Conolophus subcristatus*). The CDRS rescued 60 survivors in 1976 and launched a breeding program. These large lizards had been decimated by introduced species, especially cats and dogs. Populations have been reestablished on several islands where the iguanas had been extirpated.

Wild Tortoise Watching

Visitors can also see wild tortoises on Santa Cruz, where 3,500 individuals have free run of the island. Yellow tortuga-crossing signs remind motorists to slow down.

Males generally make their homes in the highlands, where food is most abundant, but much of the year is spent on a mating trek. Females prefer living in the mangroves near the ocean. The lowlands, where females live, are only three or four miles away, but moving at giant tortoise speed, the journey takes three months.

Our group visited Primicias Ranch. Visitors may walk around admiring and photographing tortoises, then relax with a beer at the farm’s bar and buy Ecuadorian chocolate or a bag of Galápagos coffee beans in the gift shop.

Giant tortoises live mostly quiet, solitary lives in the highlands. Despite their impressive sizes — some weigh more than



The Charles Darwin Research Station rescued 60 surviving Galápagos Land Iguanas (*Conolophus subcristatus*) in 1976 and launched a breeding program.



Galápagos Land Iguanas were decimated by introduced species, especially cats and dogs. This handsome male is part of the large colony on South Plazas Island.



Populations of Galápagos Land Iguanas have been reestablished on several islands where the iguanas had been extirpated. These individuals on North Seymour Island are descendants of ancestors relocated from Baltra Island in the 1930s.



The tortoises on Santa Cruz have free run of the island and are remarkably unfazed by tourists getting close for a souvenir portrait.



The Primicias Ranch provides visitors with opportunities to admire and photograph tortoises, then relax with a beer at the farm's bar.



At the ranch's gift shop, Jamie Abbott tries on an empty tortoise shell while Ivan Lopez cheers her on.

250 kg — they're simple animals lacking external ears and teeth. They eat hard-to-digest grass, which quickly comes out the other end, only partially digested and still recognizably grassy, and much in evidence on the farm. When not eating, they cool themselves in freshwater ponds. They're remarkably unfazed by tourists getting close for a souvenir portrait.

We were fortunate to witness tortoises mating. A renegade female had come up to the highlands, and a resident male was taking full advantage. Since the male is on top and much larger, we couldn't see the female at all. This slow production of thrusts and grunts lasts about an hour. The only other noise giant tortoises make is a hissing sound when

surprised, usually accompanied by retracting extremities. As in many turtles, the male's plastron is rounded to facilitate mounting the female. Otherwise, he might tip over.

Visitors could examine an empty shell near the gift shop. Several petite members of our group crawled inside and tried it on. They reported that it was a tight squeeze and rather smelly.

The giant tortoises are much like the Galápagos themselves. Both the tortoises and the islands sit quietly in plain sight of scientists, revealing their mysteries slowly and only to the most patient and committed people. "We know lots about giant tortoises," said Romero, who has plumbed island mysteries for nearly 40 years. "But we do not know everything."

If You Go

Visitors to the Galápagos can book a land-based or boat-based trip. Unless you get as seasick as Darwin did, a boat is more convenient. Since the ship navigates while you sleep, you'll be able to go farther than on a day-long boat trip. Meals also are provided. I can vouch for Ecoventura (www.ecoventura.com/home.aspx). I also heard good things about National Geographic Expeditions.

Most people fly into Guayaquil on mainland Ecuador, stay a night, and then fly to the Galápagos. The country's largest city, Guayaquil often gets a bad rap for being dirty and dangerous. I spent five days there and had a good time. It helped that on four of those five days I visited Parque Seminario, otherwise known as the iguana park. This is where Green Iguanas (*Iguana iguana*) live in trees, coming down during the day to commune with



Sharing a popsicle at the "iguana park" in Guayaquil.



The Green Iguanas (*Iguana iguana*) of Parque Seminario in Guayaquil (commonly called the "iguana park") live in trees, coming down during the day to commune with the townspeople, who never seem to tire of photographing them, ignoring signs to not feed them, and sneaking up on them to gently pull their tails.

the townspeople, who never seem to tire of photographing them, ignoring signs to not feed them, and sneaking up on them to gently pull their tails (don't try this in the Galápagos or you'll be deported). If you visit the iguana park and the Galápagos, you'll get to see three kinds of iguanas: Marine (*Amblyrhynchus cristatus*) and Land Iguanas, which are endemic to the islands, and Green Iguanas on the mainland. Ah, an iguana nirvana for lizard lovers.

In Guayaquil, I stayed a few nights in a boutique hotel called El Manso (<http://manso.ec/en/>) and two nights at the Oro Verde (www.orovertdehotels.com). Both were clean, safe, and staffed with friendly people. El Manso has hostel beds as well as private rooms, and will appeal to budget travelers and those who like to interact more with locals and other guests. Business travelers will feel more at home at the Oro Verde. Both have on-site restaurants.