

## TRAVELOGUE

# Who Watches the Watchers? A Pilgrimage to Darwin's Archipelago

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Photographs by the author.

When it comes to conservation, menacing and unstable political regimes can be a good thing. While superficially a democratic republic, Ecuador (to which the Galápagos Islands belong) has scrapped and rewritten its constitution 20 times in fewer than 200 years. Our tour guide regaled us with stories of how the president went as far as taking a television station off the air and suing a newspaper for describing his political arsenal as “turmoil, rocks, and sticks.”

Although one might think one consequence of such political upheaval would be the neglected stewardship of Ecuador's natural resources, Ecuador in 2008 became the first nation to grant ecosystems legal protection in



A male Great Frigatebird (*Fregata minor*) feeds his chick, less than a foot away from a commonly used footpath. Frigatebirds have the largest wingspan to bodyweight ratio of any bird, allowing them to stay airborne for over a week. They also are known as Man O' War Birds because of their kleptoparasitic feeding behavior, i.e., they steal food from other seabirds in midair as a dietary supplement. Frigates produce little oil with which to coat their feathers, cannot swim, and usually die if they hit the water while chasing food items.



While the terrestrial wildlife has a seemingly reckless disregard for the danger that humans can present, the fish of the Galápagos have a justified fear of snorkelers. This Mexican Hogfish (*Bodianus diploaenia*) turned and escaped as soon as I saw it while freediving. A fast exposure froze its face, but not its fins.

their constitution. Nature is now provided with basic civil liberties, such as the rights to “exist, persist, and regenerate.” While these environmental protections are recent developments, the Galápagos National Park dates from 1959, when only 1,000 people lived on the islands. The second largest marine reserve in the world surrounds Galápagos, and human habitation is restricted to less than 3% of the land area. Ecuador also has prohibited immigration to the islands; the only way to become a resident these days is to be born there. Enforcement of environmental laws in the Galápagos has been problematic at times, but overall the continual growth of ecotourism has resulted in stronger conservation measures. Ecuador realized early on that they were sitting on a valuable natural resource and took steps to both protect it and profit from it.

As a graduate student in herpetology, I have traveled to a number of tropical conservation areas to chase snakes, lizards, turtles, and the occasional frog, but I have never had my daily activities monitored and restricted as tightly as in the Galápagos. Land accommodations are very limited, so we only had one night on shore. We were permitted to visit each site only once for a limited amount of time, and could only go ashore a certain number of times per day. Most islands have markers along the shoreline that signify zones for tourism, local fishermen, and areas that are completely off-limits. Our boats were even equipped with GPS transmitters that were monitored by the park service to make sure we never deviated from our schedule. We could touch nothing, collect nothing, and were not permitted to step off the few existing trails in uninhabited areas. Some guides even forbid flash photography.

## Of Tortoises and Goats

While environmental legislation has curtailed the ecological damage a foreign tourist (or researcher) can cause, fewer restrictions limit what the local



A Giant Tortoise (*Geochelone nigra*) finishes lunch at the Charles Darwin Research Station on Santa Cruz, which breeds tortoises from across the Galápagos. The 100-person facility also is home to Lonesome George. George is thought to be the only extant tortoise from Pinta Island (aka Abingdon Island; *G. nigra abingdoni* is one of 11 existing subspecies) and is considered to be the rarest animal in the world.

human population can do. High birth rates have helped a population of 1,000 people grow to over 20,000 in 50 years. Non-native plant species are more diverse than native species in areas designated for human settlement. Sadly, introduced species do not acknowledge those boundaries. Wild goats are a particularly problematic example, as they are capable of removing nearly all edible vegetation from an area, including any climbable trees. Goats were introduced to the Galápagos as a human food source, but their highly efficient foraging abilities drove the iconic Giant Tortoise (*Geochelone nigra*) dangerously close to extirpation at several localities.

Thankfully, a series of wild goat extermination efforts have allowed tortoises to make a comeback. Organized hunts with dogs were reasonably effective at culling 90% of the goat herds, but the remaining animals quickly reproduced and goat populations rebounded. This continued until a new multi-million dollar plan involving “Judas” goats was implemented. A female Judas goat is captured, sterilized, injected with chemical hormones, fitted with a radio-tracking collar, and then released back into the wild. This “super-sexed” animal attracts other goats, and every month, a park service helicopter mounted with a rifle tracks down the radio beacon, and a sharpshooter kills all the goats except for the Judas (using ammunition supplied by NATO). Judas goats occasionally strand themselves on cliff-faces, and are relocated by helicopter to find new herds. Although time intensive and expensive, this wildlife management program has resulted in the complete removal of goats from several islands.

#### Don't Tread on Me

Many of the low-elevation islands receive little rainfall, and are a mix of sand, exposed rock, and thin scrub vegetation. They look quite barren



Galápagos Sea Lions (*Zalophus wollebaeki*), according to our guide, “prefer an interactive diving experience.” A snorkeler doing rolls, somersaults, and other maneuvers will find that Sea Lions quickly follow suit, and have no fear of swimming quite close to humans. Weighing several hundred pounds and capable of burst swimming speeds of over 10 m/sec, having these animals race by within a few centimeters of your dive mask is quite an experience.

## VARIATION ON A THEME

Geologically, the Galápagos Islands were never in contact with another landmass and emerged barren from the sea a scant 5 million years ago. Sometime thereafter, a pregnant Lava Lizard or a clutch of eggs survived a ~1,600-km journey from South America to the Galápagos on a log floating in the Humboldt Current. Without natural selection, this highly unlikely sea journey would have had to happen six more times, as seven currently recognized species of Lava Lizards are distributed across the islands. A simpler explanation for this pattern is that the first lizard species colonized all the remaining islands, as the longest journey between them was only 100 km. Isolated from one another, each founder population then adapted to local conditions, gradually diverging into distinct species. Subtle differences between islands and the subtle differences between lizards now inhabiting them are evidence of natural selection (although Charles Darwin noted differences only in tortoises and birds in his *Voyage of the Beagle*). Currently, *Tropidurus (Microlophus) albemarlensis* lives on the large central islands (which may have been connected at one point), while the other species are endemic to smaller islands that lie mostly on the periphery of the archipelago.

Many of Galápagos' celebrated endemic species are unique to (and named for) a single island. This has resulted in something of a taxonomic and geographic nightmare as many of the islands have multiple names. Each has at least one English name (many of them the names of pirates) from the period when Charles Darwin visited the archipelago. While the English names are commonly used today,

Ecuador has officially renamed the islands in Spanish. Natural history observations are particularly challenging. Using Lava Lizards as an example, this female *T. albemarlensis* (top, note the unusual tail regeneration) is named for the island of Albemarle (aka Isabela), but it was photographed on Indefatigable (aka Santa Cruz). It occurs on most of the central islands, each of which has one, two, or three geographic names. This male *T. grayi* (bottom) occurs only on Charles, but the same island is also referred to as Floreana and Santa Maria.



from afar, and yet the birds and reptiles are often so crowded that zoos and pet stores look spacious by comparison. While far from tame, a lack of natural predators and human persecution renders most animals completely unafraid of people. Marine Iguanas (*Amblyrhynchus cristatus*) are one of the worst offenders in this regard. The seemingly careless behavior of Galápagos wildlife, coupled with its staggering density, means that your feet must be placed with extreme care to avoid stepping on a carpet of tails, nests, eggs, and wings, interspersed with the occasional cactus.

Open space is at a premium on most islands and tour groups are regularly forced to walk within a few inches of animals mating, sleeping, eating, and nesting on the narrow paths. So, despite not being able to leave the trail, opportunities for macro photography abound. Almost anything you might wish to take a picture of can be found on the paths, including 1000-pound Galápagos Sea Lions (*Zalophus wollebaeki*). Most species seem to pay as much attention to rocks as to large cameras, and are nearly as cooperative as flowers to photograph.

### Getting There

Many companies offer package deals that couple a trip to the Galápagos with a tour of mainland Ecuador or Peru. An internet search will provide you with a number of companies that operate live-aboard charter boats, which vary by group size (10–70 people), trip length (5 days–2 weeks), and price (\$1,500–7,000). Most trips leave from Ecuador's capital of Quito; flight costs to Quito (~\$1,000) are generally not included. The city is at an



A Galápagos Land Iguana (*Conolophus subcristatus*) was kind enough to pose in front of some Galápagos Carpet Weed (*Sesuvium edmonstonei*) and one of the live-aboard catamaran tour boats.



Though somewhat less iconic than Blue-footed Boobies (*Sula nebouxi*), the red feet and eye rings of Swallow-tailed Gulls (*Creagrurus furcatus*) are an even more vibrant color. Few visual differences distinguish males and females; however, females in the Galápagos can be identified by the dirty footprints on their backs from mating. Sexual encounters are over almost as quickly as they begin; according to our guide, an average male gull will get approximately 30 sec of cloacal contact in a normal year of mating.



Waved Albatrosses (*Phoebastria irrorata*) mate for life, but have trouble recognizing their partners after long separations required for feeding trips. A call-and-response style courtship dance is used by albatrosses in part to reduce the confusion of look-alike birds. The dance consists of alternating bows, beak fencing, hoots, wing-raises, and synchronized open beaks (shown). Mates with a practiced routine will usually dance in perfect synchronization for several minutes, while dances between birds that mistake each other as mates will usually fall apart after a few moves. The albatross pictured on the left is actually dancing with the wrong bird, as its mate looks on from the right. Shortly after the photo was taken, the right bird chased off the middle bird, and then completed a perfect dance with the left (correct) bird.

elevation of ~3,000 m, so be aware that altitude sickness can be a problem. The local currency is the US dollar. Snorkeling is a common daily activity; water temperatures are usually 60–70 ° F. A limited selection of wetsuits

and snorkel gear may be available for rent; I would strongly recommend bringing your own fitted gear from home, including a full-length 3–6 mm wetsuit with a hood and booties.



A few miles below the equator, the Pointe Vicente Roca cliff face reflects a sunset on Isabela.

## Blue Iguana Story in Print !

Award-winning conservation biologist Fred Burton has released a fascinating new book about saving one of the most endangered reptiles species on earth. *“The Little Blue Book: A Short History of the Grand Cayman Blue Iguana”* is a true story of how a noble and charismatic iguana is rescued from the brink of extinction. An engaging read and a beacon of hope for conservation of reptiles.

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