

THE GALAPAGOS ARCHIPELAGO
**ENCHANTED
ISLANDS**

An unforgettable trip to Ecuador and
the magical place of origin of Darwin's
groundbreaking theory of evolution

Antonella photographs
a Santa Cruz giant tortoise
Chelonoidis porteri, Isla Santa
Cruz, Galapagos archipelago,
Ecuador. On the previous page,
Marine iguana *Amblyrhynchus*
cristatus, Isla Santa Cruz.



TEXT BY ANDREA FERRARI
PHOTOS BY ANDREA & ANTONELLA FERRARI

The Galápagos Islands are legend - a dream destination for naturalists and wildlife photographers worldwide. We have been able to visit them thanks to our friends and partners of Tropical Herping, and our extended, in-depth trip was truly unforgettable. But why are these islands so special? Some explanation is in order to understand their uniqueness...The Galápagos, part of the Republic of Ecuador, are an archipelago of volcanic islands distributed on either side of the equator in the Pacific Ocean, 906 km (563 mi) west of continental Ecuador. The islands are known for their large number of endemic species and were studied by Charles Darwin during the second voyage of HMS Beagle. His observations and collections contributed to the inception of Darwin's theory of evolution by means of natural selection. The Galápagos Islands and their surrounding waters form the Galápagos Province of Ecuador, the Galápagos National Park, and the Galápagos Marine Reserve, with a human population of slightly over 25,000. Straddling the equator, islands in the chain are located in both the northern and southern

hemispheres, with Volcán Wolf and Volcán Ecuador on Isla Isabela being directly on the equator. Española Island, the southernmost islet of the archipelago, and Darwin Island, the northernmost one, are spread out over a distance of 220 km (137 mi). The Galápagos Archipelago consists of 7,880 km² (3,040 sq mi) of land spread over 45,000 km² (17,000 sq mi) of ocean. The largest of the islands, Isabela, measures 2,250 square miles (5,800 km²) and makes up close to three-quarters of the total land area of the Galápagos. Volcán Wolf on Isabela is the highest point, with an elevation of 1,707 m (5,600 ft) above sea level. The group consists of 18 main islands, 3 smaller islands, and 107 rocks and islets. The archipelago is located on the Nazca Plate atop the Galápagos hotspot, a place where the Earth's crust is being melted from below by a mantle plume, creating volcanoes. The first islands formed here at least 8 million and possibly up to 90 million years ago. While the older islands have disappeared below the sea as they moved away from the mantle plume, the youngest islands, Isabela and Fernandina, are still being formed.

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Galapagos lava lizard *Microlophus albemarlensis*, Isla Santa Cruz.

Antonella with
a group of Santa
Cruz giant tortoises
Chelonoidis porteri
on Isla Santa Cruz.



BIODIVERSITY UNDER THREAT

The islands' biodiversity is under threat from several sources. The human population is growing at an unsustainable rate of 8% per year (1995). Introduced species have caused damage, and in 1996 a US\$5 million, five-year eradication plan commenced in an attempt to rid the islands of introduced species such as goats, rats, deer, and donkeys. Except for the rats, the project was essentially completed in 2006. Rats have only been eliminated from the smaller Galápagos Islands of Rábida and Pinzón. Introduced plants and animals, such as feral goats, cats, and cattle, represent the main threat to Galápagos. Quick to reproduce and with no natural predators, these alien species decimated the habitats of native species. The native animals, lacking natural predators on the islands, are defenseless to introduced predators. There are over 700 introduced plant species today, while there are only 500 native and endemic species. This difference is creating a major problem for the islands and the natural species that inhabit them. Non-native goats, pigs, dogs, rats, cats, mice, sheep, horses, donkeys, cows, poultry, ants, cockroaches, and some parasites inhabit the islands today. Dogs and cats attack the tame birds and destroy the nests of birds, land tortoises, and marine turtles. They sometimes kill small Galápagos tortoises and

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Yellow Warbler ■
Dendroica petechia aureola,
 Isla Santa Cruz.



■ Requiem shark, family Carcharhinidae, photographed at night from the jetty of Puerto Ayora harbor, Isla Santa Cruz.



■ Marine iguana
*Amblyrhynchus
cristatus, Isla
Santa Cruz.*

iguanas. Pigs are even more harmful, covering larger areas and destroying the nests of tortoises, turtles and iguanas, as well as eating the animals' native food. Pigs also knock down vegetation in their search for roots and insects. The black rat *Rattus rattus* attacks small Galápagos tortoises when they leave the nest, so in Pinzón they stopped the reproduction for a period of more than 50 years; only adults were found on that island. Also, where the black rat is found, the endemic rat has disappeared. Cattle and donkeys eat all the available vegetation and compete with native species for the scarce water. In 1959, fishermen introduced one male and two female goats to Pinta island; by 1973, the National Park service estimated the population of goats to be over 30,000 individuals. Goats were also introduced to Marchena in 1967 and to Rabida in 1971. A goat eradication program, however, cleared the goats from Pinta and

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Left, Galapagos sea lion *Zalophus wollebaeki*, Puerto Ayora fish market, Isla Santa Cruz; top right, taxi parking in Puerto Ayora; bottom right, Galapagos Brown Pelican *Pelecanus occidentalis urinator* and fishermen at the Puerto Ayora fish market, Isla Santa Cruz.





Marine iguana ■
Amblyrhynchus cristatus,
Isla Santa Cruz.

Santiago and most of the goat population from Isabela. In fact, by 2006 all feral pigs, donkeys and non-sterile goats had been eliminated from Santiago and Isabela, the largest islands with the worst problems due to non-native mammals. The fast-growing poultry industry on the inhabited islands has also been cause for concern from local conservationists, who fear domestic birds could introduce disease into the endemic wild bird populations. The Galápagos marine sanctuary is under threat from a host of illegal fishing activities, in addition to other problems of development. The most pressing threat to the Marine Reserve comes from local, mainland and foreign fishing targeting marine life illegally within the Reserve, such as sharks (hammerheads and other species) for their fins, and the harvest of sea cucumbers out of season. El Niño has also adversely affected the marine ecosystem. In January 2001, an oil slick from a stranded tanker threatened the islands, but winds and shifting ocean currents helped disperse the oil before much damage was done. The devastating El Niño of 1982-83 saw almost six times as much rain as normal in the Galapagos and created a wildlife catastrophe. The 1997-98 El Niño adversely affected wildlife in the waters surrounding the islands, as the waters were 5 °C (9 °F) warmer than normal. Corals and barnacles suffered, hammerhead sharks were driven away, and most of the island's seabirds failed to breed in 1997-98. The mortality rate of marine iguanas rose as the green algae they

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Medium ■
ground finch
Geospiza fortis,
Isla Santa Cruz.

■ Santa Cruz giant tortoise *Chelonoidis porteri*, Isla Santa Cruz, Galapagos archipelago, Ecuador. The shape of the tortoises' shell differs from island to island.



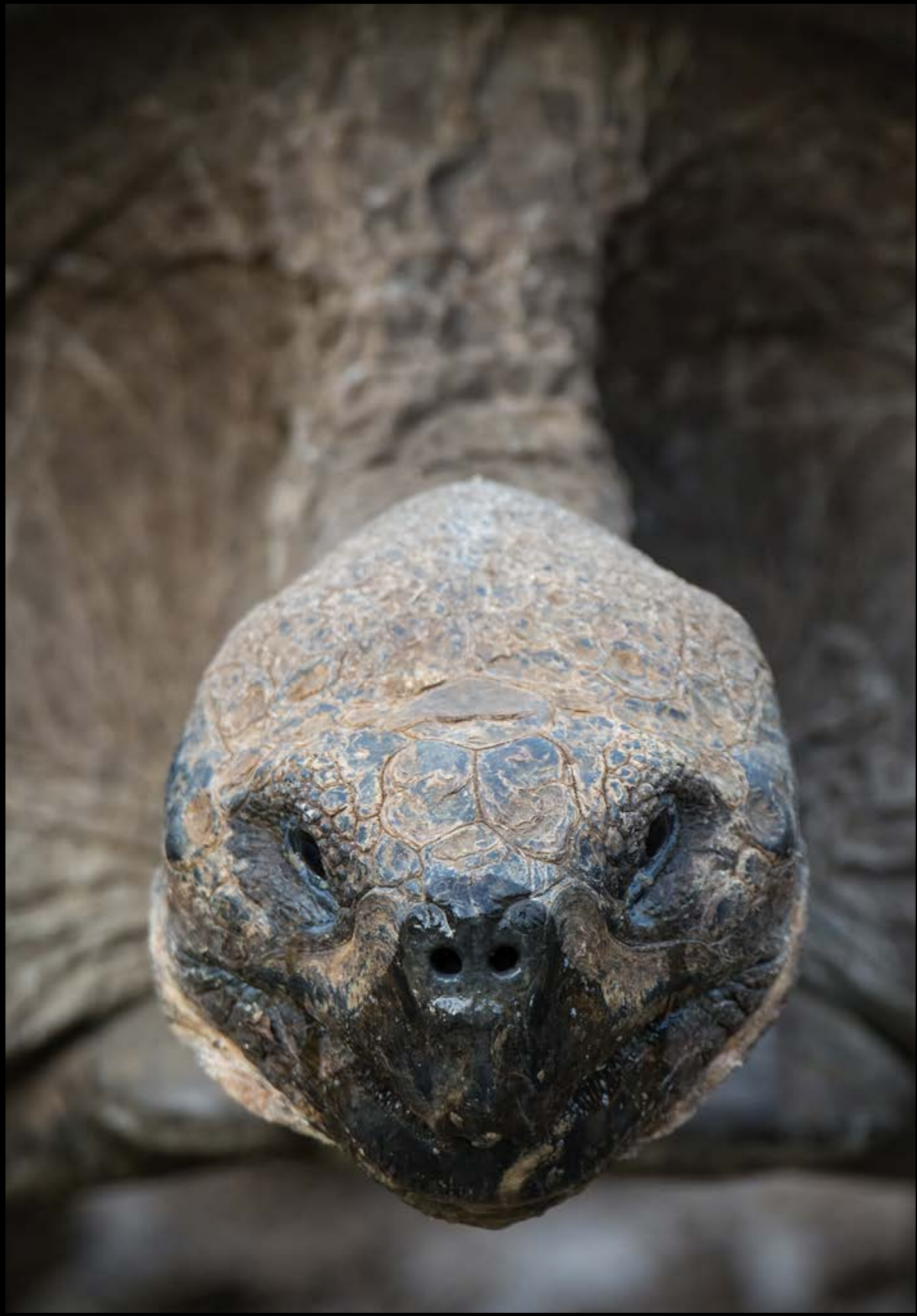


■ Left, Medium ground finch *Geospiza fortis*, Isla Santa Cruz. Right, detail of the beak of a Galapagos Brown Pelican *Pelecanus occidentalis urinator*, Isla Santa Cruz.



Galapagos
Brown Pelican
*Pelecanus
occidentalis
urinator*, Puerto
Ayora fish market,
Isla Santa Cruz.





Far left, swimming Marine iguana *Amblyrhynchus cristatus*, Isla Santa Cruz. Left, Santa Cruz giant tortoise *Chelonoidis porteri*, Isla Santa Cruz.

■ *Marine iguana*
Amblyrhynchus cristatus
basking in the sun,
Isla Santa Cruz.





■ Top left, Galapagos dove *Zenaida galapagoensis*, Isla Santa Cruz; top right, Galapagos white-cheeked pintail duck *Anas bahamensis*, Isla Santa Cruz. Bottom left, Lava heron *Butorides sundevalli*, Isla Santa Cruz; bottom right, Medium ground finch *Geospiza fortis*, Isla Santa Cruz.



Marine iguana ■
Amblyrhynchus cristatus,
Isla Santa Cruz.

■ *Marine iguana*
Amblyrhynchus cristatus,
Isla Santa Cruz,
thermoregulating in the
sun with the harbour
of Puerto Ayora
in the background.





■ Top left, the beautiful Finch Bay Hotel in Puerto Ayora; top right, Semipalmated plover *Charadrius semipalmatus*, Isla Santa Cruz. Bottom left, Medium ground finch *Geospiza fortis*, Isla Santa Cruz; bottom right, Antonella, Andrea and Tropical Herping co-founder Lucas M. Bustamante on their arrival in the Galapagos.



■ *Medium ground finch*
Geospiza fortis,
Isla Santa Cruz. It was
the shape of the beak
developed by the finches
of the Galapagos
archipelago - different
from island to island
according to their diet -
which gave Charles
Darwin the first idea
about the theory of
evolution.



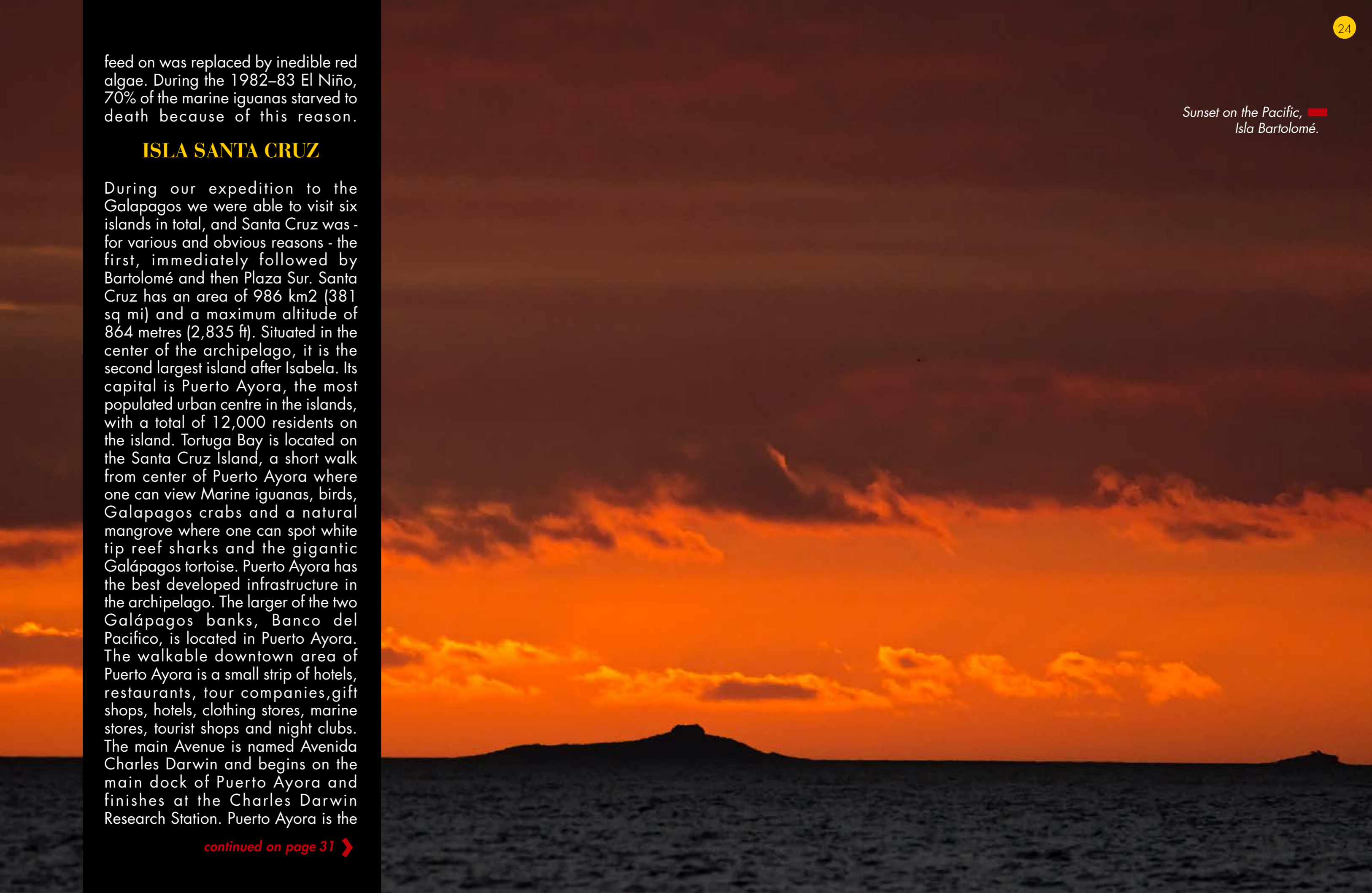
feed on was replaced by inedible red algae. During the 1982–83 El Niño, 70% of the marine iguanas starved to death because of this reason.

ISLA SANTA CRUZ

During our expedition to the Galapagos we were able to visit six islands in total, and Santa Cruz was - for various and obvious reasons - the first, immediately followed by Bartolomé and then Plaza Sur. Santa Cruz has an area of 986 km² (381 sq mi) and a maximum altitude of 864 metres (2,835 ft). Situated in the center of the archipelago, it is the second largest island after Isabela. Its capital is Puerto Ayora, the most populated urban centre in the islands, with a total of 12,000 residents on the island. Tortuga Bay is located on the Santa Cruz Island, a short walk from center of Puerto Ayora where one can view Marine iguanas, birds, Galapagos crabs and a natural mangrove where one can spot white tip reef sharks and the gigantic Galápagos tortoise. Puerto Ayora has the best developed infrastructure in the archipelago. The larger of the two Galápagos banks, Banco del Pacifico, is located in Puerto Ayora. The walkable downtown area of Puerto Ayora is a small strip of hotels, restaurants, tour companies, gift shops, hotels, clothing stores, marine stores, tourist shops and night clubs. The main Avenue is named Avenida Charles Darwin and begins on the main dock of Puerto Ayora and finishes at the Charles Darwin Research Station. Puerto Ayora is the

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Sunset on the Pacific, Isla Bartolomé.



■ The typical prehistoric-looking volcanic panorama of Isla Bartolomé.





■ Left, Galápagos penguin *Spheniscus mendiculus*, Isla Bartolomé; right, typical volcanic sand landscape, Isla Bartolomé.





■ Solidified lava detail, Isla Bartolomé.



Solidified ■
lava details, Isla
Bartolomé. One could
literally spend days
photographing such
fascinating details
while on the island -
the glassified lava
fields stretch for
hundreds of meters,
offering an infinite
variety of shapes.





Solidified lava detail, Isla Bartolomé.




■ Top, a panoramic view of the typical landscape of Isla Bartolomé; Bottom left, Galápagos penguin *Spheniscus mendiculus*, Isla Bartolomé; bottom right, Magnificent frigatebird *Fregata magnificens* at sunset, Isla Bartolomé.

best place in Galápagos for communicating with the outside world via numerous cybercafes with Internet access or telephone offices. Emergency medical facilities include a new hospital opened in 2006 and the island's only hyperbaric chamber. Most of the locals live in the northern part of the town where various schools, a market hall and a sports center were built. Most of the shops, hardware stores and grocery stores there can be found in Calle Baltra and Calle Durán. Fresh water is at a premium on the island and in this town. Locals practice water conservation and typically collect rainwater during the rainy season even if there is a desalination plant on the island. The Charles Darwin Research Station (CDRS) is a biological research station operated by the Charles Darwin Foundation. It is located here on the shore of Academy Bay, with satellite offices on Isabela and San Cristóbal islands. Here Ecuadorian and foreign scientists work on research and projects for conservation of the Galápagos terrestrial and marine ecosystems. The Research Station, established in 1959 and dedicated in 1964, has a natural history interpretation center and also carries out educational projects in support of conservation of the Galápagos Islands, and in support of external researchers visiting the islands to conduct field work.


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■ The typically arid landscape of Isla Bartolomé.





More solidified ■
lava details, Isla
Bartolomé.
Despite its solid
appearance, the
hardened lava crust
is often paper-thin
and incredibly
fragile, requiring
much attention to
avoid damaging it.



ISLA BARTOLOME

Bartolomé Island is a volcanic islet just off the east coast of Santiago Island. It is one of the "younger" islands in the Galápagos archipelago. With a total land area of just 1.2 square kilometres (0.5 square miles), this island offers some of the most beautiful landscapes in the archipelago. The island consists of an extinct volcano and a variety of red, orange, green, and glistening black volcanic formations. It has a volcanic cone that is easy to climb and provides great views of the other islands. Bartolomé is famous for its Pinnacle Rock, which is the distinctive characteristic of this island, and the most representative landmark of the Galápagos. It has two visitor sites. At the first one, one may swim and snorkel around Pinnacle Rock; the underwater world there is really impressive. Snorkelers are in the water with the penguins, marine turtles, white-tipped reef sharks, and other tropical fish. The bay is also an excellent place to go swimming. The twin bays are separated by a narrow isthmus. Galápagos penguins are frequently seen, and a small cave behind Pinnacle Rock houses a breeding colony. Seasonally, Bartolomé is the mating and nesting site for the green turtles. With herons, they make use of the gentler beaches. The Galápagos lava cacti colonize the new lava fields.



■ Magnificent frigatebird
Fregata magnificens
at sunset, Isla
Bartolomé.

ISLA PLAZA SUR


Plaza Sur is a small island off the east coast of Santa Cruz. It has an area of 0.13 km² and a maximum altitude of 23 metres, and it was formed by lava up streaming from the bottom of the ocean. Despite its small size, it is home to a large number of species and known for its extraordinary flora. The sea bluffs hold large numbers of birds, such as nesting red-billed tropicbirds and swallow-tailed gulls, and offer wide vistas. The prickly pear cactus trees *Opuntia echios* are noteworthy, as is the large colony of Galápagos land iguanas. Furthermore, the territory and breeding season of the

Galapagos land iguana overlap only on Plaza Sur with those of the marine iguana, giving rise to a unique population of hybrid iguanas. Depending on the season, the *Sesuvium* ground vegetation changes its colour from green in the rainy season to orange and purple in the dry season. ●

DON'T MISS THE SECOND INSTALLMENT OF OUR GALAPAGOS STORY – COMING IN OCTOBER 2019 ON ISSUE 36 OF ANIMA MUNDI – ADVENTURES IN WILDLIFE PHOTOGRAPHY!



■ The typical panorama of Isla Bartolomé seen from the highest viewpoint of the small island.

Swallow-tailed 
gull *Creagrus furcatus*
flying over the Pacific
Ocean, Isla Plaza Sur.





■ Top, the typically arid landscape of Isla Plaza Sur during the dry season, with the unmistakable coating of *Sesuvium* succulents a bright red and orange; bottom, Galapagos Land Iguana *Conolophus subcristatus*, Isla Plaza Sur.





Galapagos Land Iguana
Conolophus subcristatus,
Isla Plaza Sur.



■ Ruddy turnstone
Arenaria interpres,
Isla Plaza Sur.



■ Red rock crab or Sally Lightfoot crab *Grapsus grapsus*, Isla Plaza Sur - one of the most colorful and iconic species of the Galapagos archipelago.




Typical coastal landscape of Isla Plaza Sur during the dry season.



A natural swimming pool
(but the water is very cold!)
along the shoreline
of Isla Plaza Sur..



Nesting Swallow-tailed gull 
Creagrus furcatus, Isla Plaza Sur.

■ An inflatable boat loaded with tourists - accompanied by the obligatory guide - approaches the landing jetty at Plaza Sur.





A Galápagos sea lion ■
Zalophus wollebaeki frolicks
in the shallows at Isla Plaza
Sur - a common sight here.



Two typical images of the rather surreal and very photo-friendly Plaza Sur landscapes during the dry season.



A quintessential Galapagos image with a mother and baby Galapagos sea lion *Zalophus wollebaeki*, and Sally lightfoot crabs on the shoreline rocks, Isla Plaza Sur.



Left, Galapagos Land
Iguana *Conolophus*
subcristatus, Isla Plaza Sur;
right, Galápagos sea lion
Zalophus wollebaeki,
Isla Plaza Sur.

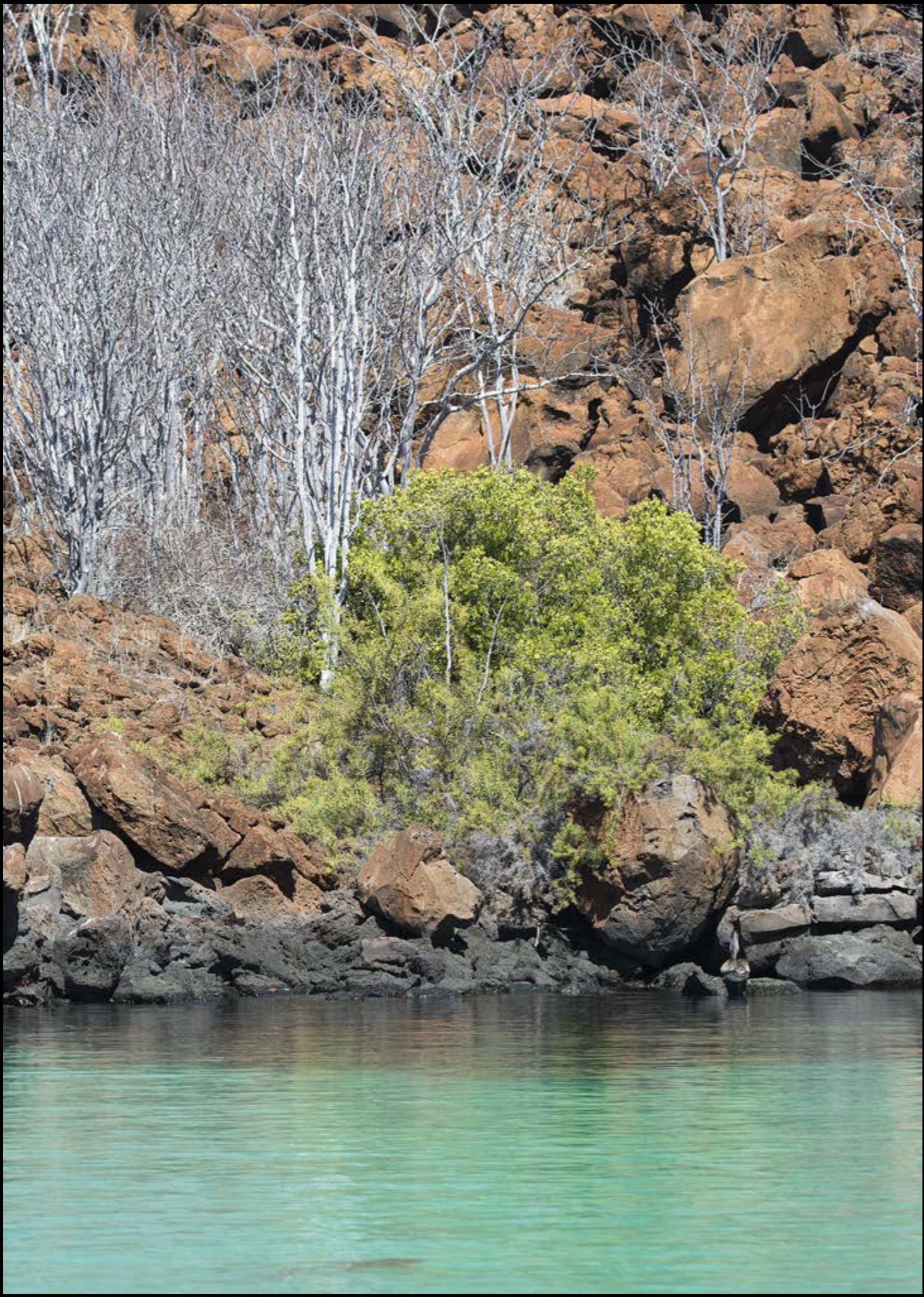


Red rock crab or Sally Lightfoot crab *Grapsus grapsus*, Isla Plaza Sur - one of the most colorful and iconic species of the Galapagos archipelago.



Galapagos
Land Iguana
Conolophus
subcristatus, Isla
Plaza Sur. These
peaceful reptiles
feed exclusively
on succulents.





■ Depending on its orientation, the Plaza Sur coastline offers quiet, glass-flat coves and scenic, surf-pounded rocky cliffs.






A tender moment between
a mother and baby
Galápagos sea lion
Zalophus wollebaeki,
Isla Plaza Sur.

■ *The stunningly colorful panoramas presented by Isla Plaza Sur during the dry season - a landscape photographer's dream.*



Swallow-tailed 
gull *Creagrus furcatus* flying
over over the pounding surf and
the steep cliffs of Isla Plaza Sur.



■ Prickly pear
Opuntia cactus
colonize the
Plaza Sur
landscape in
great numbers,
offering many
interesting
photographic
opportunities.

