GALAPAGOS NEWS

Fall-Winter 2020

GALAPAGOS CONSERVANCY WELCOMES NEW PRESIDENT DR. PAUL SALAMAN

GC PROJECT UPDATES:

Española Tortoises Go Home!

Saving Darwin's Flycatcher

Controlling a Deadly Parasite

Silent Marine Invasion

Education in a Pandemic

Also ... Whale Sharks and Illegal Fishing

Galapagos Conservancy

Saving One of the World's Great Treasures

Galapagos 2021 Calendars for Sale!

(see back cover)

www.galapagos.org

GC's President Emeritus, Johannah Barry, was honored in March 2020 by being asked to name the tortoise hatchling in this photo. She named the tortoise, Hope. © GC

FROM THE

PRESIDENT *EMERITUS*

Johannah Barry

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© Andrés Cruz

Cover Image: In June on Española Island, park rangers carried 15 adult tortoises to a lush release site where they began the rest of their lives in the wild. See pages 10-11 for the full story.

It is always a delight to write the Fall Issue's President's letter, which allows me to reflect on the year's work and to introduce our supporters and friends to the extraordinary conservation efforts of our staff and partners. Galapagos is a special kind of "convener" – bringing together institutions and individuals from around the world to protect and conserve this most special place.

This year's letter is particularly poignant as it is my last letter as President of Galapagos Conservancy. For 30 years, it has been my honor to lead this organization and to have worked with such a stellar staff here at GC, along with international teams of scientists and conservation managers, to ensure that the unparalleled biodiversity of Galapagos, marine and terrestrial, is protected for generations to come.

Which brings me to Hope. A word in short supply these days, but a word that has become particularly meaningful to me. In early March of this year, before the world changed for us all, members of the Galapagos Conservancy Board and I traveled to the Islands to connect with our many partners. It was a week of engaging and always fascinating conversations and renewals of long friendships, but perhaps the most moving and important for me were the accolades given to me by the Galapagos National Park Directorate and the Galapagos Biosecurity Agency. In recognition of our many years working together, I was made an honorary "*madrina*" (godmother) of a hatchling Española tortoise which I had the honor of naming Hope. The Española tortoise breeding program is one of the most successful Galapagos conservation stories, and to know that there is a small part of that story that has a personal link is overwhelming. I joked to the staff that I would wait another 100 years and see if she recognizes me after our brief introduction!

I was also humbled by the Galapagos National Park's recognition of GC's impact and my personal commitment in naming me as an honorary Park ranger. In the 60 years of the Park's existence, this is a rarely bestowed honor. I will most assuredly hold this award with the respect and dignity that it deserves.

Let me take this opportunity to introduce Galapagos Conservancy's new President, Dr. Paul Salaman. He is a conservation professional with decades of experience in Latin America, most recently serving as CEO of Rainforest Trust and Executive Director of the Rasmussen Family Foundation. Please know that I will be working closely with Paul over the next several months to ensure a seamless transition. I invite you to get to know Paul via his interview on pages 4-5.

I will not soon forget the decades of work, friendships, and challenges that have marked my Galapagos experience. Nor will I forget that I did not face this alone. In addition to the wonderful GC staff that I have been privileged to work with, the advice, encouragement, and counsel of the GC supporters made this all possible. Quite simply, I could not have done this without you.

For Galapagos,

Galapagos Conservancy
Saving One of the World's Great Treasures

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GALAPAGOS CONSERVANCY MEMBERSHIP

GALAPAGOS CONSERVANCY STANDARD MEMBERSHIP

Thanks to all of our members who make our work possible. We could not preserve, protect, and restore the Galapagos Islands without your generosity and commitment to conservation. Our annual membership levels are as follows:

Friend: $30 **Supporter: $100** **Protector: $500**
Family: $50 **Advocate: $250**

GALAPAGOS AMBASSADOR SOCIETY

With your gift of $1,000 or more (or cumulative annual giving of $1,000), we will welcome you to the Galapagos Ambassador Society. Many of our Galapagos Ambassadors are often willing to become closely and regularly involved in our programs. Ambassadors receive special updates and briefings; invitations to attend special member events; recognition in the GC Annual Report; and a special Ambassador welcome gift.

Española Society: **$1,000 to $2,499**
Pinta Society: **$2,500 to $4,999**
Santiago Society: **$5,000 to $9,999**
Fernandina Society: **$10,000 to $24,999**
Isabela Society: **$25,000 and up**

GALAPAGOS GUARDIANS SOCIETY - Monthly Giving

Galapagos Guardian Society members give recurring monthly contributions that are charged automatically to a credit card. These members help us reduce our fundraising costs because we do not send them annual membership renewal notices for the duration of their support. This is an easy and secure way to provide GC with ongoing funds that we can use to address the most critical conservation challenges in Galapagos. To join, please see the mail-in form to the right or join online at **www.galapagos.org/monthly**.

If your employer matches charitable contributions, you could double your impact on Galapagos Conservancy's efforts. **GC's EIN # is 13-3281486.**

2020 Year-End GIVING CHALLENGE

◊ GOAL = $125,000 ◊

Make your tax-deductible, year-end contribution to help keep the Galapagos Islands protected during these extraordinary times and to help Galapagos Conservancy reach its 2020 year-end goal of $125,000. You'll also be supporting the efforts of the Galapagos National Park, the Galapagos Biosecurity Agency, and other GC partners working to safeguard the Islands during the pandemic.

❑ **YES!** Galapagos Conservancy needs my extra support during this challenging year!

Member Name(s): _____

_____

Address: _____

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City, State, Zip: _____

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Email: _____

❑ My check is enclosed.

Or, please charge my:

❑ Visa ❑ AMEX ❑ Mastercard ❑ Discover

Name on Card:

_____

Card Number: _____

Expiration Date: _____ CVV #: _____

Signature: _____

Donation Amount: $ _____

❑ I'd like to make this gift a monthly gift and become a member of the Galapagos Guardians Society. By checking this box, I agree to have my credit card charged once a month for the amount indicated above ($10 minimum).

Questions?
Email: member@galapagos.org
Cut out, use centerfold envelope, or mail this form to:

Galapagos Conservancy - Member Services
11150 Fairfax Blvd. Suite 408
Fairfax, VA 22030 USA

To make your gift online, visit:

www.galapagos.org/2020challenge

(B20K)

WELCOME, DR. PAUL SALAMAN!

Barely one month on the job, our intrepid new president, Dr. Paul Salaman headed off to Galapagos to experience our conservation projects in action and to meet GC's field team and many local partners. Reporting from the field, Paul took the time to answer a few questions!

Tell us about your early childhood years as a self-proclaimed "wildlife conservation enthusiast."

Well first, I'm just back from surveying Darwin's flycatcher in the highlands of Santa Cruz — and fortunately saw a few of the very last pairs to survive on the island — which reminds me of my very first introduction to Galapagos. I was about nine when an Ecuadorian neighbor who knew I was fond of wildlife told me about the incredible wildlife on her islands. I was hooked and my bucket list began! But it was a year or so before that when my passion for wildlife conservation began. In 1979, my primary school nature club in London, UK was invited to meet and sit with famed BBC broadcaster and natural historian, David Attenborough. In that short hour learning from Sir David about our unique planet and its amazing wildlife, my life changed. From then on, I committed everything I did to treasuring and preserving all life.

What drew you to work in South America from a young age, and which experiences from these adventures most inspired your work as a conservationist?

With my laser focus on wildlife conservation, I wanted to help where most needed. It was clear that South America had a great conservation need, with its vast wealth of biodiversity combined with immense threats. The clock was ticking on avoiding mass extinctions in the region. In 1991, as a university freshman, I pulled together a team of biology students in Cambridge, UK and launched a small fundraising campaign to fund our expedition to South America. During my trip research, I noticed a huge gap for Colombia — a country in the middle of a civil war, yet second only to Brazil in biodiversity richness. As a reckless teenager, I thought nothing of the risks and led the expedition into a remote rainforest of western Colombia. An abandoned cocaine lab in the middle of the rainforest was our base, and there we discovered many species that were new to science. On returning to the UK, I raised the funds to buy the land and established a community nature reserve that still protects this area (the lab was converted into a ecotourism lodge!). I led many more expeditions to Colombia with quite a few harrowing experiences, but we were always impressed by the warmth and hospitality of South Americans and delighted that they welcomed conservation. By the early 2000s, I had expanded my attention to Ecuador with regular visits and even had become a permanent resident living in Quito.

What was your inspiration to help Galapagos?

The wildlife of Galapagos are undeniably awe-inspiring. Like my first impression at the age of 9, this is one of the few places on earth where wildlife and people live side-by-side. There is no greater inspiration than sitting beside a giant tortoise, Darwin's flycatcher, or blue-footed booby. This 'living laboratory,' where natural selection is seen in real time, was the catalyst for changing the human perspective of the world and our place in it. What greater inspiration can there be!

What do you feel are the biggest challenges facing Galapagos?

Extinction is our greatest challenge. We think of Galapagos as a pristine paradise, yet tragically more unique species have gone extinct in Galapagos than in mainland Ecuador, Colombia, and Peru combined. Once abundant, some wildlife, like the giant tortoises, were exploited to the brink of extinction and tragically too many of those species are no longer with us — like Lonesome George — the very last Pinta Island giant tortoise who died on June 24, 2012. One of the greatest tragedies is the loss of species that share our planet.

Our challenge is simple. We must work to safeguard the hundreds of endemic species across this archipelago, such as 14 unique species of giant tortoises and 17 different Darwin's finches, precious varieties of life found nowhere else on the planet. Native species are under immense pressure from the plague of invasives like blackberries and parasitic flies. Sitting here today, my hope is that Galapagos will one day be an example of how mankind corrected the damage of the past and demonstrated that we can live in harmony with nature.

Why did you choose Galapagos Conservancy as the next step in your successful career?

Galapagos Conservancy is the only US non-profit and largest international organization solely dedicated to conserving this precious archipelago. Realizing the tremendous threats facing the islands' wildlife, I was anxious to join GC and immediately ramp-up efforts to save 59 *critically-endangered* species from imminent extinction. All of these species are at risk because of non-native invasive plants and animals that were accidentally introduced and have aggressively taken over the islands. At the top of the invasives list are botflies that feed on baby nestling birds and introduced blackberry thickets that smother native plants. These challenges only multiply if we do not confront them now. So I joined this fight, as there is no better place to be than at the helm of GC to make a difference.

You've just finished your first month as the president of Galapagos Conservancy. Has anything surprised you?

Yes — two things have surprised me. First, I am utterly impressed that Galapagos Conservancy has been achieving real and lasting impacts to preserve, protect, and restore Galapagos since 1985 — a legacy filled with tremendous success stories. Rare birds are thriving again where feral goats once dominated; giant tortoise populations have been restored on islands where they had gone extinct; and creative education programs are cultivating new conservation leaders. Our future investments will strengthen major restoration projects, tackle emerging conservation issues, and prevent the entry and spread of new invaders.

Lower left: Dr. Paul Salaman had the honor of releasing a Galapagos petrel back to the wild during his November 2020 trip to Galapagos. *Above:* Paul, far right, also met the science team at the CDF and explored the Santa Cruz highlands where he snapped these photos (below) of a Darwin's flycatcher and a yellow warbler.

My second surprise was the amazing team at GC, our engaged and committed board of directors, and our many amazing supporters — many of whom have been with GC for decades. I'm indeed humbled and proud to take the helm from our esteemed President Emeritus, Johannah Barry, who has led the organization for more than 30 years and is so respected and admired here in Galapagos.

While in Galapagos – during COVID – what were your first impressions?

The main streets would normally be a throng of tourists and the shores around the islands dotted with small cruise ships … but the islands and seas now lie devoid of visitors. It is hard to see local businesses closed permanently and mass unemployment. There has been no economic bailout here, and local people are suffering immensely. But so, too, is the wildlife. Funds received from the tourism entrance fee that were used to pay for park guards and to protect the marine reserve are now empty. The risks and challenges only increase by the day, and GC support is more critical than ever before.

Many people have visited or dreamed of visiting Galapagos. How can they help save this special place?

The Galapagos experience is profoundly moving. We've made great advances, but there are many challenges that remain and solutions to be uncovered. We cannot do it alone. It is through the support of our members — people like you who have visited the Islands, or dream of visiting one day; people who understand the importance of protecting this special place — that allow us to fulfill our mission of saving this global treasure. Galapagos Conservancy is needed here now more than ever, and we rely on YOU to keep our critical conservation efforts alive.

GALAPAGOS NEWS

A *threatened* **Galapagos rail chick on Santiago © Michael Dvorak, CDF**

INDUSTRIAL FISHERIES THREATEN GALAPAGOS MARINE LIFE

Marine fisheries provide a vital source of food for humanity. Unfortunately, the combination of massive fleets and sophisticated technology is devastating our oceans. The last bastions of safety for many marine species are the marine protected areas, such as the Galapagos Marine Reserve, that protect the rich marine life up to 46 miles around the Archipelago, plus the 230 mile limit of the waters designated as the Ecuadorian Exclusive Economic Zone.

In May 2020, Hong Kong customs officials made a record seizure of shark fins which included Critically Endangered scalloped hammerhead sharks, a species that was once very abundant around the Galapagos Islands. Tragically, sharks are slaughtered in the millions every year, especially in the Eastern Pacific around Galapagos — the lucrative business of using their fins for soup is one of the main reasons. As top predators, the role of sharks is essential; without them, the balance of the ocean's ecosystem is at risk.

In July 2020, a vast fishing armada of nearly 300 predominantly Chinese vessels arrived and hovered around the borders of the Galapagos marine protected area for several months. Their presence threatens all marine life around the Archipelago, migratory species such as the whale shark, and everyone that depends on a healthy ocean for food and livelihoods.

This is a pivotal time for ensuring that key areas get the protection they need to help conserve threatened marine species, in Galapagos as well as globally. Galapagos Conservancy, the Ecuadorian government, and many other partners have been looking to strengthen protection for the Galapagos Marine Reserve, including expanding the Ecuadorian Exclusive Economic Zone, to shut down international fisheries, and to create a critically-needed marine corridor between mainland Ecuador and adjacent countries of Colombia and Peru. This will save countless migratory marine species.

For many years, Galapagos Conservancy has invested in marine patrolling, helping the Galapagos National Park to maintain their rapid response fleet and to improve their ability to track marine traffic. In 2017 the park rangers and Navy marines captured a giant fisheries mothership crossing the Marine Reserve with a cargo that included thousands of sharks. The subsequent process to confiscate the Chinese ship and the arrest of its 20 crew members showed just how hard it is to protect marine sanctuaries. We are proud to support the National Park's monitoring efforts and to have enabled the creation of ***Shark Count***, a user-friendly App that allows Galapagos divers to help monitor marine life in the Galapagos Marine Reserve.

Visit sharkcount.org to learn more.

HOPE SPOT

A vital underwater migration highway that connects the Galapagos Marine Reserve in Ecuador and the Cocos Island National Park in Costa Rica has been declared a Mission Blue Hope Spot. Galapagos Conservation Trust, GC's sister organization in the UK, has been supporting the proposed Cocos-Galapagos Swimway since 2018 by helping science partners gather essential evidence needed to drive forward the creation of this 120,000 km^2 area, which is critical for protecting endangered Galapagos marine species including whale sharks.

RARE SIGHTING OF RAIL CHICKS

The Landbird Conservation Group of the Charles Darwin Foundation, with support from Galapagos Conservancy and the Galapagos National Park Directorate, undertook a landbird population census on Santiago Island, including Galapagos rails, in February 2020. This year the team was lucky to be there at the height of their breeding season and saw a number of Galapagos rail chicks, which is rare as they are normally very secretive birds. Santiago is thought to have the largest population of Galapagos rails in the Archipelago, and these sightings confirm that they are doing well on the island once again.

It is important to note that rails were not faring well back in the 1990s as a result of intense habitat destruction by invasive goats and other mammals. Thanks in large part to Galapagos Conservancy's efforts with Project Isabela, a multi-institutional large-scale effort aimed at removing harmful invasive mammals from several islands in Galapagos, the ecosystem rebounded and is able to support healthy native species populations again.

The Galapagos rail is still listed as *Vulnerable* on the *IUCN Red List of Threatened Species* due to threats such as invasive predators and habitat destruction. Galapagos rails are found on six islands, including Santiago, and are locally extinct on San Cristóbal and Floreana Islands.

30 NEW MARINE INVERTEBRATE SPECIES

An investigation in the deep protected waters of the Galapagos Marine Reserve has identified 30 new species of marine invertebrates, including four species of squat lobsters, one species of giant cup coral, ten species of bamboo corals, three species of octocorals, one species of brittle starfish, and eleven species of sponges. The exploration also revealed the presence of a series of underwater communities between depths of 290 and 3,373 meters, including multiple fragile habitats such as crystal sponge gardens, coral gardens, and cold-water coral colonies.

This research was carried out during a 10-day cruise aboard the *E/V Nautilus*, a research vessel specialized in exploring the unknown depths of the ocean up to 4,000 meters. The expedition explored three seamounts (underwater mountains that do not break the surface) located around the islands of Darwin and Wolf for the first time.

Two remotely-operated underwater vehicles (ROVs) were used for the exploration, *Argus* and *Hercules*, in addition to seabed mapping systems. Biological samples were collected using the manipulator arm of the ROV, and individual organisms were separated, photographed, and stored. At the end of the cruise, the specimens were sent to renowned deep-sea experts for identification. The results of this research were published in the journal *Scientific Reports* in August 2020.

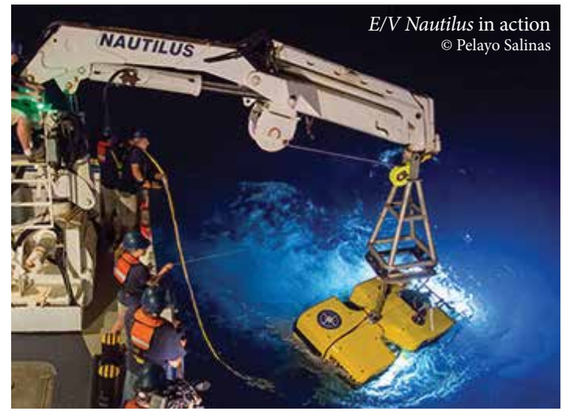
"This finding confirms that Galapagos is a living laboratory with biological and ecological processes underway and yet to be explored, which makes it an exceptional site that deserves all our efforts to be conserved," said Paulo Proaño, Ecuadorian Minister of Environment and Water.

MARINE IGUANA MONITORING

Recent monitoring of Galapagos marine iguanas at the Playa de los Perros visitor site on Santa Cruz Island shows that the population is stable and in good health. Park rangers from the Galapagos National Park Directorate (GNPD) have conducted regular monitoring of marine iguana populations for the past seven years, an effort which was started because of sightings of underweight and dead iguanas in various areas around Galapagos several years ago. That situation was related to the low production of green and red algae, their primary food source, which coincided with the warming of ocean temperatures.

According to GNPD technicians, food availability is just one factor that can impact weight changes in marine iguanas. In the case of males, for example, energy expended to breed during the mating season and to defend their harem in the presence of other males can contribute to weight changes. In females, the construction of nests and days spent in nests can negatively impact their weight.

Galapagos Conservancy is an important source of financial support for the GNPD; our annual support helps them carry out important monitoring activities of wildlife populations around the Islands.



E/V Nautilus in action
© Pelayo Salinas

Tagging a whale shark
© Simon Pierce

IN PURSUIT OF **HOPE**

by Jonathan Green, *Naturalist Guide, Dive Master, and Royal Geographical Society Fellow*

It was dawn off Darwin, the most northerly of all the islands in Galapagos, as we prepared for the first dive of the day on September 5, 2019.

The conditions had not been in our favor and a powerful southerly current made the diving conditions difficult, threatening to pull us away from the protection of Darwin's Arch and into the treacherous open ocean.

Beneath the water, we spread out along the lava ledges, hugging the rock and maintaining visual contact, watching and waiting. Within minutes, the unmistakable shadow of a whale shark passed over us from the north. We let go of the wall in unison, swimming upwards towards the subadult female and succeeded in attaching a satellite tag without her even noticing. Hanging just below the surface, we watched as the outline of this shark slowly dissolved before us, taking tag #184027 with her into the void.

It was almost two weeks later, back in port and with an internet connection, that we picked up the signal from this whale shark, an individual we decided to name Hope. Shortly after our encounter, she set out on a route that has now become familiar.

Just north of Darwin (1), (see map at right) some 2,000 meters beneath the surface, lies the Galapagos Rift, an East-West tectonic divide in the ocean floor between the Cocos Plate to the north and the Nazca Plate to the south. At this landmark, Hope turned to the west like other whale sharks before her, apparently tracking the Rift out into the open Pacific Ocean.

Hope continued her westerly travels until the last days of December, by which time she'd carried her tag more than 3,000 km from Darwin's Arch. She looped back on herself (5) and headed southeast down to the East Pacific Rise, the fissure between the Pacific Plate to the west and the Nazca Plate to the east (6). Then, at the beginning of March this year, she dived and swam due east, resurfacing after some 500 km as if heading back towards Galapagos (7). But instead of making a single-loop migration as we imagined, she made a dramatic U-turn and swam west once more and in mid-May she re-crossed her own track from several months earlier (8).

The track from Hope's tag
© 2020 Google

Hope's last transmission came at the end of May (9). We do not know why we lost touch at this point in her travels. It's possible that she dived down to 1,800 meters or more, a depth at which the extreme pressure would have crushed the satellite tag. Alternatively, and worryingly, she may have encountered one of the many industrial fishing fleets that make this area one of the most intensely fished regions of the Pacific. After a month of no news, the team decided to check her last transmission. The data suggest that the tag was fully out of the water and that it was travelling much faster than the maximum speed of a whale shark. We cannot say for certain what happened to her and cannot be sure that she was captured. However, in previous years, two smaller female sharks we were tracking both stopped transmitting in this same patch of water.

Whatever has happened, Hope has made history. She had covered, as the crow flies, the greatest distance that any of our tagged Galapagos whale sharks has travelled. She will, of course, have moved even further than this, as the satellite tag – which only transmits at the surface – can tell us nothing about the twists and turns she may have taken when out of range in the cold depths.

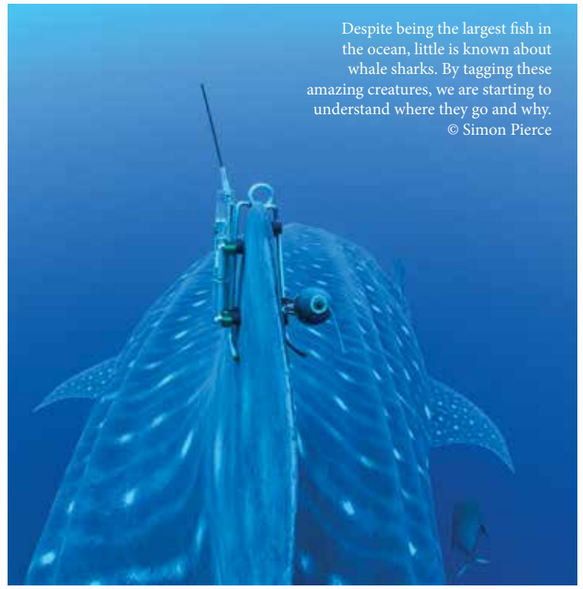
Hope's migration brings us closer to understanding the many factors – submarine geological features, water temperature, food availability, and the drive to reproduce – that underlie the decisions these gentle giants make as they navigate the ocean. This is key to their conservation, as it is only with these insights that we will know when and why whale sharks are extra vulnerable and how we can protect them throughout their incredible long-distance lives. ■

Darwin's Arch is where most of the whale sharks are tagged. © Jonathan Green

Extending Protected Waters

The disappearance earlier this year of Hope captured global interest, especially as her tag stopped working in an area of high industrial fishing effort. Every year industrial fishing fleets gather between the boundary of the Galapagos Marine Reserve (GMR) and the Ecuadorian Exclusive Economic Zone (EEZ) to make the most of the abundance of fish. There are serious concerns for the marine wildlife of Galapagos as many migratory species, including whale sharks, leave the safety of the GMR to travel to foraging and breeding grounds. The Ecuadorian government is working on a protection strategy for the Galapagos Islands, which could include extending both the EEZ and the GMR to cut off the corridor of international waters between the two areas.

Galapagos Conservancy is going to ensure this becomes a reality and will do everything we can to support these efforts.



Despite being the largest fish in the ocean, little is known about whale sharks. By tagging these amazing creatures, we are starting to understand where they go and why.
© Simon Pierce

GC's Washington Tapia looks on as Diego takes his first steps on Española Island in more than 80 years. © GTRI/GC

GC PROJECT UPDATE

ESPAÑOLA Tortoises GO HOME!

by **Galapagos Conservancy's Giant Tortoise Restoration Initiative team**

On Monday, June 15, 2020, Galapagos Conservancy and the Galapagos National Park Directorate released the original group of 15 reproductive adult tortoises from Española Island (*Chelonoidis hoodensis*) back to their island of origin as part of the Giant Tortoise Restoration Initiative (GTRI).

The Española tortoise breeding program, which was established in the mid-1960s, represents one of the most successful endangered species recovery programs ever undertaken anywhere in the world. These 15 last remaining tortoises from Española effectively saved their species from extinction and are contributing, through their offspring, to the restoration of the island's ecosystem. With the return to their island of origin, they have joined approximately 2,300 of their offspring, many of which are now old enough to reproduce naturally on Española. Following the eradication of introduced goats and the subsequent vegetation recovery, the island is now able to support the growing tortoise population in the long term. As a result of these successes, the decision was made to close the Española tortoise captive breeding program.

"This captive breeding program, in addition to the management actions implemented on Española island, give us the peace of mind that we managed to save a species that would otherwise have become extinct. It can only be described as successful and an example of the conservation efforts that we implement as a National Government in synergy with our allies," said Paulo Proaño, Minister of Environment and Water.

THE EXPEDITION

The 15 breeding tortoises were subjected to an extended quarantine process, as their release was initially planned for March 2020, but the COVID-19 pandemic prevented their transfer at that time. Prior to their release, they were internally and externally de-parasitized and an identification microchip was placed in each. At dusk on a Sunday, the tortoises were loaded on board a Galapagos National Park boat that would sail for Española on Monday.

After arriving on the island and completing the disembarkation on a quiet beach, the rangers and scientists began the difficult 1.5 mile journey inland to Las Tunas, where the largest number of *Opuntia* cacti is concentrated (the primary food for tortoises), which will facilitate the tortoises re-adaptation to their home island.

"The work is difficult but the commitment is strong; the 12 females, weighing an average of 77 lbs, were carried by a single person, while for the 3 males whose weight exceeded 120 lbs, two people were needed in relays. After the release, the staff remained for approximately four more hours, making observations of the behavior of the tortoises as they settled back into their home," said Danny Rueda, Director of the Galapagos National Park.

"The first monitoring trip will take place in six to twelve months," commented Washington Tapia, Director of the GTRI through Galapagos Conservancy. "However, each tortoise has a GPS satellite tag that will send six positions daily. We also deployed forty motion-triggered cameras distributed throughout the island. These will allow us to monitor all of their movements and activities."

DIEGO'S LEGACY

The famous giant tortoise Diego, originally transferred back to Galapagos from the San Diego Zoo, has also returned to his island of origin almost 80 years after he was removed.

Diego's story began when there was a need to increase the number of males in the captive breeding program. Only 12 females and 2 males were found on Española Island, as this species was heavily exploited by mariners in the 1800's to the point of near extinction. It was necessary to do a worldwide search to determine if there were more individuals, especially males, that could contribute to the genetic variability of this unique species. The search paid off, and an adult male was found at the San Diego Zoo, having been collected on the island by a research team in the mid-1930s.

The tortoise was returned to Galapagos in 1977 and quickly joined the captive breeding program, originally started and managed in its first decades by the Charles Darwin Foundation. Diego became an active contributor to the reproduction of a large number of hatchlings (approximately 40%).

Despite their great age (Diego is more than 100 years old), all of the tortoises remain fit and agile and are expected to do well back on their home island — and perhaps even better than in captivity, given the abundance of food and space available on Española Island. ■

"After more than five decades, and in one case eight decades, away from their home island, they were returning to live out their lives among their children and grandchildren, in a growing population that existed because of them. I believe they knew they were home."

- Washington Tapia, Director of the GTRI

Photos above: Rangers hiked 3 km with 70 to 120-pound tortoises on their backs. All of the rangers involved pose at the release site with some of the 15 tortoises they just returned home. (© Andrés Cruz for GTRI/GC)

© GNPD

36 SAN CRISTÓBAL TORTOISES RETURN TO THEIR NATURAL HABITAT

In September of 2020, rangers from the Galapagos National Park Directorate (GNPD) reintroduced 36 tortoises from the *Chelonoidis chathamensis* species to the northwest portion of San Cristóbal, their home island, as part of the Giant Tortoise Captive Breeding and Reproduction Program that has been carried out since 2002. The tortoises are between six and eight years old and weigh between seven and ten pounds — large enough to be safe from predators.

The tortoises were transferred by speedboat from the dock at Puerto Baquerizo Moreno to a coastal area about thirty miles from the port. From the shore, fourteen park rangers began the four-mile journey through rugged terrain to the lush and green release site. The rangers ensured that the tortoises began to explore and feed before returning to the breeding center.

San Cristóbal Island has an estimated population of 6,700 giant tortoises, according to a comprehensive 2016 census. Seventy-five tortoises have been repatriated from the San Cristóbal breeding center, including this group; thirty were released last year and nine in 2012.

Adapted from a GNPD press release from September 2020.

SAVING DARWIN's FLYCATCHER

GC PROJECT UPDATE

© Paul Salaman/GC

Long-term monitoring revealed that Darwin´s flycatcher is disappearing from several islands of the Galapagos Archipelago. In 2019, Galapagos Conservancy helped head-start experimental habitat management in the hope that this popular bird may once again become a common sight. With such heartening results after the first year, we wish to extend a big thank you to everyone who supports our work.

It has only been three decades since the Darwin's flycatcher was a common sight on Santa Cruz. Since then, their numbers have dramatically decreased with only 40 breeding pairs now found on the island. In response to these declines, the Charles Darwin Foundation and the Galapagos National Park Directorate, in collaboration with the University of Vienna, launched a three-year conservation program in 2019. The team identified six plots in key flycatcher habitat to focus their objectives and help mitigate against the main threats to the population on Santa Cruz.

Firstly, the team began restoration of the plots to improve access to vital feeding grounds. The insects crucial for chick rearing are lacking in areas heavily invaded by plant species like non-native blackberry. Furthermore, blackberry forms a dense understory leaving few open areas near the ground for adults to hunt. During the year, local workers and Park rangers continued to clear areas of invasive blackberry and *sauco* plants to allow native, endemic plants to grow freely. This work demands continuous effort, as invasive plants can quickly reinvade. Although all activities had to be stopped in March 2020 due to COVID-19, thankfully four out of the six plots were fully cleared prior to lockdown, ensuring the birds could benefit from improved hunting conditions for longer.

Reducing predator pressure via rat control is the team's second key objective. After placing bait stations in the six plots last October, only one nest out of eleven (9%) failed due to predation in comparison to 22% of nests outside of the controlled plots. Further work to verify these findings will be undertaken during the next field session.

The team's final objective is to increase the fledging success of flycatcher nests. To do this, they captured and banded ten individual birds, racked up more than 80 hours of nest observations, and treated twelve nests with insecticide to reduce the impact of the invasive parasitic fly *Philornis downsi*. The team saw the successful fledging of six chicks from three nests, all of which had been treated with insecticide. Again, fieldwork was stopped before the team managed to collect all the data on failed nests, meaning data collection during the 2021 field season will be even more important for the future of these birds.

In just the first year of implementing these conservation actions, the team has already managed to improve the breeding success for these beautiful birds compared to previous years, despite activities being suspended during lockdown. As Galapagos relaxes movement restrictions, scientists are returning to the field as quickly and safely as possible to resume clearing the plots and monitoring these vulnerable birds prior to the start of the next breeding season beginning this November.

INVESTIGATOR

"Removing invasive plants from the experimental plots resulted in the highest breeding success for the last five years."

DAVID ANCHUNDIA, Galapagos Land Bird Conservation Project researcher funded by Galapagos Conservancy

GC PROJECT UPDATE

EDUCATION IN A GLOBAL PANDEMIC

A six-year-old examines fairy shrimp found behind her house on Santa Cruz.

by **Richard Knab,** *GC's Director of Strategic Partnerships and Leader of the ESG Program*

On June 1, 2020, instead of heading off to one of the 20 schools in Galapagos to begin the new academic year, 7,500 students in Galapagos remained at home.

They participated in *Aprendemos Juntos en Casa* (We Learn Together, at Home), a national initiative of the Ministry of Education to ensure safe instruction during the COVID-19 pandemic. And Galapagos Conservancy's **Education for Sustainability in Galapagos program (ESG)** was there to help teachers continue their progress, while navigating the new challenges brought on by COVID-19.

Galapagos students and parents, like their counterparts around the world, are eager for schools to reopen. In the meantime, the Ministry's COVID-19 response has dovetailed with ESG's pre-pandemic goal of helping teachers transition from the design and implementation of individual lessons connected to Galapagos, lasting one or two class periods, to multi-week, interdisciplinary units of instruction that extend learning beyond the classroom while tapping local expertise.

When the school year began, teachers and parents received *fichas educativas*, weeklong instructional units. These *fichas* were designed to reduce some of the stress associated with planning by allowing teachers to focus on contextualizing learning to their students' surroundings and to foster interdisciplinary approaches, project-based learning, and greater parental involvement in their children's education. As of August, the *fichas* grew to span four- to five-week periods.

Every week, Galapagos Conservancy's ESG program coaches participate in virtual planning meetings with teachers by grade group in each of the 20 schools in Galapagos, where the school's director, teachers, and coaches-in-training (40 teacher "leaders" being trained by the program) review the *fichas* and exchange ideas for adaptation and implementation. Throughout the week, program coaches and coaches-in-training meet individually with teachers to support project planning. Specific attention is given to connecting *fichas* to local Galapagos examples.

In 2021, the ESG Program will continue its ongoing cycle of weeklong Teacher Institutes (our next Institute in January will be conducted virtually), classroom observations, and professional learning circles. Our cadre of local coaches will play an increasing role in delivering professional development. Now that most teachers use student-centered teaching strategies, a prerequisite to effective Education for Sustainability, a greater emphasis will be placed on helping teachers to deepen their understanding of the environmental and sustainability issues confronting Galapagos, and to involve local experts (scientists, conservationists, business owners, community leaders) as partners in the design and implementation of interdisciplinary *fichas* of their own. We will also explore the possibility of extending learning beyond school hours through teacher-led clubs that explore conservation and sustainability issues.

"It has become clear to me that students are engaged most when learning is connected to real issues in their daily lives. For example, a recent unit focused on the consumption of local food. Students understood the positive impact they can have on their surroundings by consuming locally produced foods because less energy is wasted in transportation and there are fewer opportunities for invasive species to enter. This kind of contextualized learning is the best way to help students conscientiously reflect about where they live."

ZANDRA VILLACIS, 6th Grade Teacher and Vice Principal at the Galo Plaza School on Santa Cruz Island, Galapagos

Causton, left, checks a trap intended to catch *Philornis downsi* flies. © Liza Díaz Lalova for CDF

How to Control **A Parasite**

by **Charlotte Causton,** *Senior Research Scientist at the Charles Darwin Foundation*

As we made preparations for this year's fieldwork, the weather was our biggest concern. Little did we know that a global pandemic would shut down research for three-and-a-half months in the middle of the bird-breeding season, a crucial window for testing methods to control the invasive parasitic fly *Philornis downsi* — enemy number one of the smaller Galapagos landbirds.

These invasive flies, introduced from mainland Ecuador by accident, are experts at locating bird nests, where they lay their own eggs. Once the maggots hatch, they feed off the blood of young chicks, sometimes killing an entire brood. To date, *P. downsi* is known to attack 21 different landbirds, more than half of which are species of Galapagos finch. It is a very serious threat to the survival of at least six species, including the critically endangered mangrove finch. The parasitic fly also threatens some populations of Darwin's flycatcher, the most colorful landbird in Galapagos.

In a race against time, the Charles Darwin Foundation (CDF) and the Galapagos National Park Directorate (GNPD) are coordinating a multi-institutional and multi-country project to research the biology and ecology of this little-known fly, with a view to developing effective, environmentally friendly means of control. One promising approach is biological control, which involves introducing one of the fly's natural enemies from its native range to the Archipelago. Exploratory surveys on mainland Ecuador, led by the University of Minnesota and CDF, have identified a small wasp, *Conura annulifera*, that is itself a parasite of *P. downsi*. After five years of careful work, results indicate that this wasp is a *Philornis* specialist. We now have the go-ahead to bring a small number of wasps into a quarantine facility in Galapagos in order to assess whether it is safe to introduce the wasp to the Islands.

In the meantime, we need to deploy other tools to protect the nests of those species at the greatest risk of extinction. Before COVID-19 brought an end to our fieldwork this year, we were fortunate to have completed some trials injecting a small amount of an insecticide into the base of the nests where the blood-feeding larvae reside when they are not feeding on the chicks. This work, carried out by CDF, GNPD, and the University of Vienna, has significantly increased the survival of chicks from four threatened bird species, including the mangrove finch and Darwin's flycatcher. In collaboration with scientists from SUNY-ESF and Syracuse University, we are also investigating whether we can use fly pheromones and bird odors to lure adult *Philornis* flies down from the canopy and into traps (see *photo above*).

All of our efforts to control this deadly parasite require a mix of ingenuity and perseverance. We are fortunate to have the ongoing support of Galapagos Conservancy, and to be working with a large group of dedicated scientists who are not deterred by setbacks like COVID-19 and who will continue the work to ensure the conservation of the unique landbirds of Galapagos. ■

Galapagos Conservancy is a proud supporter of the CDF's efforts to combat *Philornis downsi* to save the landbirds of Galapagos.

The *Conura annulifera* wasp, a potential biological control for *Philornis downsi*. © *Dave Hansen for University of Minnesota*

Two of the most invasive species found in Galapagos waters: green algae, *Caulerpa racemosa,* and orange colonial sea squirt, *Botrylloides niger.* (© S. Green / CDF)

Inset: Marine debris colonized by marine animals, collected at Galapagos beaches and bays. (© P. I. Tapia and J. Manuel García / CDF)

The Silent **Marine Invasion**

by **Isabela Tapia,** *Research Assistant for the Marine Invasive Species Program at the Charles Darwin Foundation*

Growing up in the world's most famous natural laboratory of evolution is a unique experience. Local children develop a special relationship with nature from a very young age, and we almost innately learn to protect it. Just as it is a privilege to live here, I believe that honor also carries a personal responsibility.

Being raised in Galapagos helped me realize that, just as we rely on nature, our actions that threaten it could destroy our own existence. This understanding guided my decision to study biology in college, as I was looking for a career that would help protect my home with impactful solutions. In 2019, I was given the opportunity to be a research assistant with the Marine Invasive Species Program (MISP) led by Dr. Inti Keith of the Charles Darwin Foundation (CDF).

The MISP conducts research on invasive species in the Galapagos Marine Reserve and aims to guide decisions for their prevention, early detection, and management. Every day we work to minimize the negative impacts of marine invasive species on the Islands' unique ecosystems and biodiversity.

Invasive species have social and economic impacts on our communities, and tackling such invasions requires researchers to work with an empowered community that understands the importance of protecting nature. The MISP team has achieved important results and continues to carry out ground-breaking research since the program began more than eight years ago. Before the program started, only five introduced species were known to exist in the Marine Reserve. Our investigations have now identified 53 introduced species — and as the work continues in this largely unexplored field, this number is expected to increase significantly.

We have collected marine debris — most of it plastic — across the Islands and identified any organisms attached. This alone confirms that marine debris acts as a means for transporting invasive species. As of 2019, we had analyzed 1,442 samples and recorded 11,267 individual organisms, and we found that 25% of all plastic debris found on Galapagos beaches was colonized by at least one animal or plant. Our findings will lead to strategies that improve the conservation of this unique marine world.

The concept of "invasive species" is well known in our community, though generally, people think of the terrestrial invasives such as feral goats, pigs, rats, ants, blackberry, etc. To that end, it is important to share these stories through outreach and education activities with children from local schools and the community in general. We are improving our tools and strategies to communicate the science to young Galapagueños, and we aim not only to engage and inform, but to empower and inspire some of them to pursue a career in conservation, like my colleagues and me. ■

Galapagos Conservancy is a proud supporter of the CDF's Marine Invasive Species Program since its inception in 2012.

AUTHOR

PATRICIA ISABELA TAPIA, native to Galapagos, is a Biology honors graduate from Newcastle University and has worked as a research assistant for the Marine Invasive Species Program at the CDF since 2019.

♦ COVID-19 UPDATE ♦

Local chefs keep busy at the food kitchen. © Isabela Bucheli

We Need A BIGGER POT

by **Roslyn Cameron,** *GC's Galapagos Liaison and Long-term Galapagos Resident*

As the impact of the global pandemic reached Galapagos in March 2020, Galapagos Conservancy provided emergency assistance for the Galapagos National Park Directorate, the Galapagos Biosecurity Agency, and other partners working to safeguard the Islands. We also helped bring 3,000+ residents stranded on the mainland home under meticulous entry protocols. Once everyone was back home, our support turned to emergency supply kits that are delivered to the most vulnerable and isolated residents.

With tourism coming to a sharp halt, many Galapagos families were left without an income. Vegetable gardens sprouted in home backyards and the community rallied quickly to make sure that no one would go hungry. Private and public initiatives provide more food kits that have become the lifeline for a growing group of people. Fishermen donate fresh fish, bakers gift extra loaves of bread, and farmers provide meat, milk products, and vegetables. The excess from home gardens is exchanged for goods or donated to the kits. Those who are employed help by donating non-perishable items, such as baby needs and propane gas tanks for cooking.

Months have now passed, bringing no significant change in people's situations. GC's Washington Tapia has been contributing from his home garden and helped direct our donation to be able to buy basics, such as canned goods, rice, vegetable oil, and much needed cleaning supplies. With field work also mostly halted due to the pandemic, Galapagos Conservancy assigned an important part of what had been budgeted for field supplies in 2020 to a community kitchen. The kitchens evolved from the fact that many people were living without cooking facilities or the funds for basic utilities. Volunteer chefs and women's groups rolled up their sleeves and got cooking healthy meals for hundreds, and storage space was provided for frozen and dry goods. To avoid a proliferation of single-use plastic and to avoid possible infection by the virus, kitchen patrons bring their own containers. Isabela Bucheli, coordinator for the Santa Cruz Island kitchen shared, "I think preparing food and feeding people nourishes our bodies and our spirits."

As of November, the local economy is slowly recovering, but survival for many still depends on the cooperation and goodwill of institutions and individuals concerned about Galapagos today and for the future. Our generous donors make this and so much more possible.

Galapagos Conservancy is needed now more than ever. ■

Top: GC's Washington Tapia, left, delivers supplies to the Santa Cruz kitchen. © *Isabela Bucheli*

Bottom: The pandemic has presented families with an opportunity to learn how to grow their own food. © *Ashleigh Klingman*

— Book Launch —

Available 11/27/2020!

GALAPAGOS GIANT TORTOISES

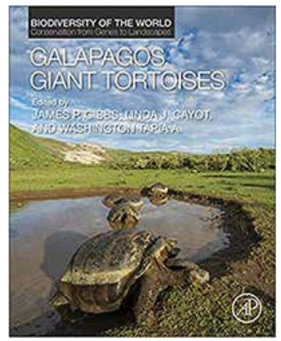
By James P. Gibbs, Linda J. Cayot, and Washington Tapia

published by Academic Press, 2020 ISBN: 978-0-12-817554-5

This book is the latest addition to the collection, *Biodiversity of the World: Conservation from Genes to Landscapes*. More information, including how to order, can be found at **www.elsevier.com**

For a special discount and free shipping, use **Promo Code, LIFE320**

After conducting decades of research and advising on giant tortoise conservation, including helping to rediscover descendants of a thought-to-be-extinct giant tortoise in the Galapagos Islands earlier this year, Galapagos Conservancy's own Washington Tapia, Dr. Linda Cayot, and Dr. James Gibbs have released the world's leading resource on these island dwellers: ***Galapagos Giant Tortoises***.



Despite being icons of the world-famous Galapagos Islands and the target of more than 50 years of conservation research and management, Galapagos giant tortoises, their evolution, and much of their ecology remained unknown — until recently. The 25 chapters of the book document the history, pressing conservation issues, and success stories recovering several of the 15 different species of Galapagos tortoises from near extinction. These include ongoing efforts to "de-extinct" two species of giant tortoises.

Readers will enjoy an historical overview of the relationship between humans and the Galapagos giant tortoises, including stories of exploitation by pirates and whalers. The iconic reptiles' biology is explored, including the evolution, taxonomy, ecology, habitats, reproduction, and behavior of these gentle giants. Captive breeding, invasive species management, and tortoise health — as well as the current status and distribution of every species — are discussed.

The book also features first-hand testimony, many images of tortoises in the field, and four case studies of species restoration, and concludes with the editors' prognosis on what the future holds for all tortoise populations.

"This book provides the first synthesis of our knowledge of these famous creatures, and will serve as a guide for full restoration of the giant tortoise dynasty of Galapagos over the next century," commented Gibbs. ■

Based on a news release from SUNY-ESF, used with their permission.

— Book Excerpt —

GALAPAGOS REVEALED

Finding the Places that Most People Miss

By GC's own Ros Cameron & Randy Moore

See order information on page 18.

ON THE SNAIL'S TRAIL: (a book excerpt)

The first private collection of snails to be incorporated into the science collection at the Charles Darwin Research Station is a meticulously labeled collection of terrestrial snails donated in 2009 and collected by Belgian settlers André and Jacqueline De Roy since their arrival in Galapagos in 1955. Named the *André De Roy Invertebrate Collection*, this gift added many new species to the 60+ known species of endemic land-snails (*Bulimulus*) in Galapagos. With approximately 90 species now identified, this collection is an impressive example of how an ancestral species arrived and evolved into new species by adapting to the conditions found in the islands.

SNAIL-SNIFFING DOGS

Perhaps the greatest example of an ancestral species adapting to a multitude of new forms is the Galapagos endemic land snails of the genus *Bulimulus* that have colonized most major islands and are found across five of the six described vegetation zones. Many of these snails have only been classified in recent years, but these exhilarating discoveries have also produced sobering conclusions. On the inhabited islands, endemic snails are threatened by expanding agriculture and grazing livestock, as well as large invasive snails that outcompete them.

Galapagos is home to the first Canine Brigade in Ecuador; dogs specifically trained to detect the invasive giant African snail. Fortunately, quick action has kept this harmful pest isolated to Santa Cruz Island, and regular monitoring with nimble-footed dogs has prevented the threat from spreading. Luna, an impounded local stray, demonstrated such talent that she has now joined the brigade. Galapagos Conservancy proudly helped set up this canine program, including the training for the dogs and their Galapagos handlers, and continues to support the efforts of the Galapagos Biosecurity Agency to prevent invasive pests entering or taking hold in the Islands. ■

Galapagos Conservancy
Saving One of the World's Great Treasures

NEWS & VIEWS

PLAN YOUR FUTURE IMPACT ON GALAPAGOS

THE GALAPAGOS LEGACY SOCIETY is comprised of special friends of Galapagos who have demonstrated their commitment to the long-term conservation of the Archipelago by making a planned gift through Galapagos Conservancy.

Your support of GC *now* ensures that our efforts to preserve, protect, and conserve the Galapagos are possible. Have you considered extending your positive impact on Galapagos?

Think of creating or updating your will as an essential and practical task – like going to the doctor every year – that prevents the worst and sets you up for the best. A will is the perfect way to extend your love for your spouse, children, and grandchildren while showing gratitude to friends and charitable causes that have benefited your life.

At Galapagos Conservancy, planning your own legacy is not one-size-fits-all. There are a number of simple and convenient ways for you to make an impact. From annuities to bequests, we work with you and your financial institution to create a charitable plan that fits your personal and charitable giving goals.

If you would like to learn more about including Galapagos Conservancy in your will, we would be happy to answer any questions and assist you in your planning – please give us a call at 703-383-0077 or send an email to:
legacy@galapagos.org

GIVE & ADOPT!

Symbolic Animal Adoption Kits

Ranging from $30 up to $100, we offer symbolic adoptions for tortoises, blue-footed boobies, sea lions, and marine iguanas. A great gift for a budding conservationist!

Gift Memberships and Honor & Remembrance Gifts

Honor your loved ones by supporting the important conservation efforts in Galapagos! Gift levels start at $30. Recipients will receive a beautiful card informing them of your gift, which you can personalize with a special message.

Books, $15 - $25

We offer a limited selection of Galapagos books. Our latest title is ***Galapagos Revealed: Finding the Places that Most People Miss***, written by GC's own Ros Cameron, a long-time Galapagos resident and conservationist. *(See excerpt on pg. 17)*

Eco-friendly items for the holidays!

From T-shirts and notebooks to wine tumblers and reusable straws, we have gifts for a variety of GC fans.

www.galapagos.org/shop/

Bring Galapagos to your Zoom Meetings!

Give your colleagues, friends, and family a change of scenery on your next Zoom call with our virtual Galapagos backgrounds! We have five high-resolution virtual backgrounds that you can download from our website for your next Zoom call.

South Plazas Island © GC

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Visit smile.amazon.com and select Galapagos Conservancy as your beneficiary charity!

THANK YOU!

Your support matters — and has made such a difference over the last few months.

"Overnight the pandemic left many people without an income and, as the months pass, now it's about survival. Our community has rallied to make sure no one is alone facing this daily threat. Thank you for helping provide meals for the most vulnerable."

Isabela Bucheli
Community Kitchen Coordinator

"As part of the GTRI team, I get to see firsthand the great advances in protecting and restoring the tortoises. Thank you for helping to ensure that our next field trip can go ahead. It is crucial that we can monitor their well-being and understand the mysteries of the world's biggest tortoise."

Jeffreys Malaga
Galapagos Park Ranger since 2000

"With your help, teachers have been able to continue classes using virtual education toolkits. All of us who live in Galapagos need to understand our role in shaping a sustainable society. Education is vital to the future of the wildlife of Galapagos, so thank you for your ongoing support."

Suelen Figueroa
Teacher on Santa Cruz Island

Galapagos Conservancy

Without your loyalty, we would not be able to support the people who are protecting the unique wildlife of Galapagos. Please continue helping us to ensure that some of the rarest species in the world do not disappear forever.

Photo credits, Circles: Isabela Bucheli, GNPD, Jennifer Davidson Benficiaries: GC, GTRI/GC, GC Background: Rabida Island by Andy Teucher

Galapagos Conservancy
Saving One of the World's Great Treasures

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THANK YOU! Your support matters and has made a big difference in 2020!

ENJOY THE GALAPAGOS ISLANDS YEAR-ROUND!

Our stunning **Best of Galapagos 2021 Calendar** was created exclusively for our Friends of Galapagos to celebrate Galapagos' amazing biodiversity. It is compiled of nearly fifty breathtaking photographs — the best of the best photos, all taken by our talented members for our annual photo contests over the last 10+ years. Perfect for the home or office, this calendar reminds us daily of the importance of protecting our fragile earth. It is printed on recycled paper, making it a perfect gift for you or your favorite conservationist.

2021 calendars can be ordered online at: **www.galapagos.org/shop/**