LAND IGUANAS in the Clouds

Tortoises Sowing Seeds

Skates in Hot Water

PROJECT UPDATES:
Giant Tortoise Restoration Initiative
Education for Sustainability
Rebounding in the Marine Reserve
Plastic-free Galapagos

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In this issue of Galapagos News, our donors are front and center as they should be! None of our work would be possible without the support and guidance of our friends and members. Here, we recognize our donors who have been with us for 25 and 30 years. Their commitment and dedication, and often their notes of support and encouragement, have meant a lot to those of us at Galapagos Conservancy, and we feel that they are truly an extension of our staff. Thank you, all.

We are pleased to share with you the important work being done by Dr. Jon Witman at Brown University on the impact of climate change in the marine environment of Galapagos. Fluctuating water temperatures are proving to have negative impacts on coral and are contributing to fish disease, as well as providing an opportunity for migration to Galapagos of species historically located in warmer waters. We have been supporting Dr. Witman’s work for two years and believe that these data will be important to decision-making in the future. You can also read about how plastics are impacting the marine environment. Not only are they a health issue for marine animals, as well as a visual nuisance, but they also are proving to be a vehicle for the introduction of invasive marine species.

Galapagos Conservancy supports a number of projects and programs in the islands, and our project updates and blog excerpts are an excellent way to learn about the fascinating work being implemented by talented local and international scientists engaged in critical conservation efforts. This community of like-minded conservationists is a tribute to the important role the Galapagos Islands play in our understanding of the natural world.

No issue of Galapagos News is complete without mention of our tortoise work. We hear from Dr. James Gibbs of SUNY-ESF and Wacho Tapia, Leader of the Giant Tortoise Restoration Initiative (GTRI), on their work on Santa Fe and Santiago Islands. On Santiago, Tapia was disturbed to find few adult females, and those he found were quite old. This finding clearly has implications for any breeding and restoration efforts for this population. Dr. Gibbs’ experience on Santa Fe was more promising, finding many young, healthy tortoises with plenty of potential. His full blog post, posted online, also reveals his fruitless attempts to keep the endemic rice rat out of his backpack and tent.

These are only a few of the projects and programs we are delighted to bring to your attention. As always, great work by talented and dedicated people are protecting and preserving this most special place. Your partnership has made this all possible. Our thanks and best wishes to our Galapagos Conservancy community for a wonderful new year.

FROM THE
PRESIDENT
Johannah Barry
**26 TORTOISES RETURNED FROM PERU**

After a lengthy stay in Peru following a wildlife trafficking attempt in April 2017, 26 young Galapagos tortoises were finally returned to the Islands in June 2018. A technical team from the Galapagos National Park Directorate (GNPD) executed the necessary procedures to enter the tortoises into quarantine at the Galapagos Air Base on Baltra Island, where they will remain in quarantine until the end of 2018. They are being kept in a specially-constructed corral, designed by GC’s Giant Tortoise Restoration Initiative’s (GTRI) Director Wacho Tapia, within the Air Base which has been set up to meet all of the conditions the tortoises require for optimal well-being during this period.

Specialists from the GNPD and Galapagos Conservancy reviewed the physical conditions of the tortoises and placed a subcutaneous identification device in each, upon their arrival. The tortoises are active and healthy, and feed on chopped cactus provided by Park rangers.

**FELIPE CRUZ OBITUARY**

We are saddened to report that Felipe Cruz (at left with GC’s Linda Cayot), who worked passionately for the conservation of Galapagos for more than four decades, passed away in Chile on August 9, 2018. He was 60 years old.

Cruz was born on Floreana Island on April 22, 1958. He was one of 12 siblings, many of whom have played important roles in Galapagos. Over the years, he held many different roles in Galapagos. He led this massive, multi-million-dollar project to a successful conclusion, eradicating goats and donkeys from northern Isabela and Santiago Islands, as well as eliminating the goat population on Pinta.

GC’s Giant Tortoise Restoration Initiative personnel — Linda Cayot and Wacho Tapia — worked closely with Cruz on many past projects at both the CDF and the GNPD. Upon his death, Linda said, “I cannot imagine this world without Felipe Cruz. He was a close friend and will be missed.”

**40 YEARS AS A WORLD HERITAGE SITE**

September 2018 marked the 40th anniversary of the Galapagos Islands being declared the very first UNESCO World Heritage site. In 1978, this title was awarded to the Archipelago for its collection of unique flora and fauna — many of which are endemic. Management of the Islands is governed under a special regime that safeguards their long-term conservation.

In honor of the occasion, the GNPD held a public event showcasing their work and that of their partners. Members of GC’s GTRI Team, including Director Wacho Tapia (second-from-right, below), enjoyed explaining the tortoise nesting and incubation process along with various other components of the tortoise breeding programs to those in attendance.

Ecudor’s Ministry of the Environment wrote on Twitter that Galapagos was “the first site in the world to be included in the prestigious list of natural heritage sites, of which there are currently 222.” We remain grateful to play an important role in the conservation of this remarkable chain of islands.

**LAND IGUANA RELOCATION**

Galapagos National Park rangers recently transferred six land iguanas of the species Conolophus subcristatus from the island of Venecia, located to the northwest of Santa Cruz Island, to the nearby visitor site Cerro Dragón. The shortage of rain, little food, and high population number of land iguanas on the island motivated the transfer as a management measure to ensure the survival of these individuals.

Park rangers placed tracking devices on the six iguanas relocated in order to track and monitor their health status and survival in their new homes.

Venecia did not originally have land iguanas, but in the mid-1970s, part of the iguana population of Cerro Dragón was taken to the islet to protect them from the presence of feral dogs that threatened their existence. That initiative also included the transfer of tons of soil from Santa Cruz to create a suitable nesting area for the iguanas.

The efforts to control introduced species carried out by the GNPD in Cerro Dragón eliminated the wild dogs and made it a safer place so that land iguanas could survive in their natural habitat. The relocation began in 1990. Since then, the GNPD has carried out more than 100 transfers — especially during times of drought or lack of food — while at the same time working at Cerro Dragón to control introduced predators such as donkeys and wild cats.

Land iguanas, or yellow iguanas, serve the ecological function of natural herbivores in the islands in which they inhabit. They can measure more than three feet long and weigh up to 28 pounds. They eat mainly the fruit of cactus plants.

**DETERMINING SEX IN PENGUINS**

There is a new, non-invasive and reliable way to sex a Galapagos penguin, according to scientists from the University of Washington. Like all penguin species, Galapagos penguins lack external genitalia, the two sexes look similar, and both sexes incubate eggs and rear offspring. Until recently, the only way to distinguish males and females was to take a blood sample. It turns out, however, that a ruler is all that’s needed, as males consistently have thicker beaks than females, report scientists in the journal Endangered Species Research. This new technique will speed up data collection during field work. It will also be important for studies looking at how the two sexes are affected by threats such as shifting climatic conditions. This research was funded, in part, by Galapagos Conservancy.

**GALAPAGOS MARTIN AFFECTED BY PHILORNS**

More than a dozen pupae of the parasitic fly Philornis downsi have been found in a nest of a Galapagos martin on Isabela Island, report ornithologists from the Charles Darwin Foundation (CDF). The discovery adds another species to the long list of endemic landbirds that are attacked by this invasive species. These endangered martins are found in low numbers and little is known about their biology or natural history, which makes it hard to protect them against potential threats. They nest in cliffs next to the sea, making them hard to find and then monitor. CDF and the GNPD now plan to inspect more nests to evaluate the impact of Philornis downsi on the population. This work was funded by Galapagos Conservancy as part of the Blue-footed Booby census completed in 2017.

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Determining sex in penguins
A bite from a land iguana can be a very painful matter. They munch through cactus pads, spines and all; they can pierce through each other’s skin during a fight, and they could easily take off a finger.

The reptile, however, is being skilfully handled by “iguanero” Johannes Ramirez, a Galapagos National Park (GNP) ranger with special expertise working with iguanas. We work quickly to avoid causing the animal undue stress. We determine its sex and approximate age, record its length and weight, and insert a tiny electronic identity tag under the skin on the left thigh. We must also examine its overall condition, noting any bite marks, missing claws and coloration, and take three mugshots, all in a matter of minutes.

Johannes has just released the 109th iguana caught during this two-day fieldtrip. This is a new record. It is not that we are becoming faster at processing them, it’s that we are in the right place at the right time. We are on the rim of La Cumbre Volcano, a massive volcanic crater on the island of Fernandina, one of the most active volcanoes in the Archipelago (see p. 4), and female land iguanas have come here in search of soft soil in which to lay their eggs.

In the clouds, at 1,300 m above sea level, La Cumbre is an important place for these iguanas. Males hold territories near the summit, which is where mating occurs. However, there is also soft soil in which to lay eggs. When the nesting season comes around, it is the females that compete for space. As soon as all nesting sites are taken, any late-coming females have no choice but to descend almost 500m into the crater to lay their eggs.

After an incubation period of almost three months, the emerging hatchlings rush for cover in an effort to avoid a suite of predators that lie in wait, including Galapagos hawks, racers, short-eared owls, and barn owls. The 109 iguanas we have surveyed so far are true survivors.

“ The 109 iguanas we have surveyed so far are true survivors.”

These are the largest herbivores on Fernandina, acting just as Galapagos giant tortoises do on other islands, dispersing seeds of many plants and grazing the vegetation. They can even reshape the landscape, digging intricate burrows many meters long in which to shelter from the blistering sun.

Like many other Galapagos species, land iguanas are highly susceptible to introduced predators. When Charles Darwin visited Santiago Island in 1835, he struggled to find a spot to pitch his tent due to the high density of land iguana burrows. Yet within 100 years, this species had vanished from Santiago because of predation by feral pigs and dogs.

On Fernandina, there are no introduced vertebrates (other than the odd smooth-billed ani), making this the perfect place to study the natural ecology of land iguanas.

This research will help the GNP manage land iguanas on Fernandina, but it could also inform efforts to reintroduce the species to Santiago in the not-too-distant future.

For now, the sun is setting on this iguana kingdom. “Should we catch one more?” asks Johannes. He has his eye on a large iguana under a Scalesia tree. We have just one microchip left, I tell him. He smiles and we prepare to collect one last set of data.

Author Spotlight

Luis Ortiz-Catedral is a lecturer in Environmental Science and Ecology at Massey University in New Zealand. Since 2010 he has worked with the Galapagos National Park monitoring and researching threatened native species in Galapagos, including the critically-endangered Floreana mockingbirds and Galapagos racers (snakes—a study supported by a grant from Galapagos Conservancy). Since 2012, he has also turned his attention to land iguanas, as his conservation efforts continue to span many species and islands in Galapagos.
Hercules landed on a ridge on the seafloor, just north of a hydrothermal vent on the Galapagos Rift. As we maneuvered the remotely operated vehicle through a plume of black smoke being emitted by the vent, we were stunned to see images of black smoke being emitted by the hydrothermal vent on the Galapagos, 45 km north of Darwin Island. We wanted to explore and field inside the Galapagos Marine Reserve approximately 600 km northeast of the Archipelago and more than 1 km below the surface. As if this discovery wasn’t exciting enough, the photos revealed a strange habitat teeming with otherworldly life: clams, giant tube worms, anemones, and much more.

Scientists already knew about the existence of mid-ocean ridges before the discovery of hydrothermal vents. In the 40 years since their original discovery, we now know that many sections of the global mid-ocean ridges host hydrothermal vents. The Galapagos Rift is part of the global oceanic spreading ridge system, a series of faults and fractures on the deep ocean floor where molten mantle material emerges to create new oceanic crust. The water that emanates from these vents is mostly seawater drawn through faults in the seafloor, super-heated by a magma chamber and released back into the ocean. When the scalding, sulphide-rich water drifts from chimney-like vents, it resembles black smoke, which is why these structures are commonly referred to as “black smokers.”

There are only two known examples of animals using volcanically heated soils to incubate their eggs: the modern-day Polynesian megapode, a rare bird native to Tonga; and a group of nest-building dinosaurs from the Cretaceous Period. As far as we know, this is the first time incubating behavior using a volcanic heat source has been recorded in the marine environment. Hydrothermal vents are extreme environments, with high-temperature fluids and low oxygen levels that are likely to challenge species that have not evolved to live in these conditions. This observation is one of very few that demonstrates a link between the hydrothermal vent environment and animals that live most of their life elsewhere in the oceans.

As a result of their long lifespan and the slow rate of development at ambient deepwater temperatures, these skates may be particularly sensitive to threats to their environment. With seafloor mining at some hydrothermal vents about to start, this is especially pertinent. It is imperative that we improve our knowledge and understanding of the development and habitat use of such species, which will be vital for developing effective conservation strategies. More broadly, it is clear that we still have a lot to learn about this deep-sea ecosystem.

Examining the egg cases more closely, we could see that there were not just a few, but layer upon layer. Some of them were greenish, an indication that they had been incubated near the hydrothermal vent for a number of years. Though they had hatched out completely, whatever had been incubating in these cases had been doing so year after year, and it was probably not just one individual. This was one of many discoveries made during a 2015 expedition carried out by the Charles Darwin Foundation, the Ocean Exploration Trust, and an international team of researchers. Our goal was to use the Hercules remotely operated vehicle (ROV) to get closer to the high-temperature “black-smokers” and into an active hydrothermal field inside the Galapagos Marine Reserve approximately 45 km north of Darwin Island. We wanted to explore and sample the highly-evolved animal communities living in this other-worldly environment, but it’s fair to say that nobody had been expecting to find these egg cases.

From high-definition video footage, we were able to identify 157 egg cases and collected four specimens with the ROV’s robotic arm. These were sent for DNA analysis, which revealed that they belonged to the Pacific white skate (Bathyraja spinosissima), one of the deepest-dwelling skate species and one previously not known to occur near vents.

Using the positional and temperature data obtained from the ROV’s sensors, we were able to map the locality of each of the egg cases in relation to the hydrothermal vent. We found that the majority of the egg cases observed were found within 20 m of the chimney-like black smokers, the hottest area of a hydrothermal vent field, and almost 90% had been laid in places where the water was significantly warmer than background water temperature at this depth. This led us to believe that the skates may be using the warmer temperatures in the area to speed up the incubation of their eggs.

“It’s fair to say that nobody had been expecting to find egg cases.”

Left: More than 150 white skate egg cases were discovered near the black smoker, and all appeared to be different ages depending on the color of the cases.

Below, left: Using the ROV’s robotic arm, the team collected four egg cases for DNA analysis.
Any lower and the conditions appear to be too dry for humid highlands down to about 100 m above sea level. On Santa Cruz, guava occurs from the most abundant in the humid highlands of Galapagos’ four main difficult species to control. Guava grows well in moist soil and is (Galapagos, and on other Pacific islands like Hawaii, is guava that are capable of transforming the composition and function of the Islands. More recently, tortoises have probably also assisted the spread of introduced species. Most of these recent arrivals are benign and do not have a significant impact on endemic and native species. What if, however, tortoises are unwittingly helping spread invasive plant species? A single pile of tortoise scat may contain more than five thousand seeds. Owing to the huge amount of fruit a tortoise consumes, its slow pace of digestion, and the large distances it covers, a seed that has passed through the gut of a giant tortoise may find itself many kilometers from its parent plant.

Before the arrival of humans in Galapagos almost 500 years ago, the seed dispersal provided by Galapagos giant tortoises surely played a significant role in shaping the distribution of plants across the Islands. More recently, tortoises have probably also assisted the spread of introduced species. Most of these recent arrivals are benign and do not have a significant impact on endemic and native species. What if, however, tortoises are unwittingly helping spread invasive plant species that are capable of transforming the composition and function of a local ecosystem? One of the most aggressive invasive tree species in Galapagos, and on other Pacific islands like Hawaii, is guava (Psidium guajava), known throughout the world as a particularly disruptive alien invasive species in Galapagos. Guava grows well in moist soil and is most abundant in the humid highlands of Galapagos’ four main human-inhabited islands. On Santa Cruz, guava occurs from the humid highlands down to about 100 m above sea level. Any lower and the conditions appear to be too dry for germination — though that may not always be the case.

In previous work, we have shown that giant tortoises often prefer to eat invasive plants over endemic and native species, and guava appears to be a particular favorite. In the inhospitable lowlands, we frequently find piles of tortoise scat full of guava seeds. Although these do not appear to be viable at present, the climate in Galapagos is constantly changing and most models predict warmer and wetter conditions in decades to come, with increased rainfall in the lowlands. Are tortoises sowing the seeds for a massive spread of guava in coming decades, as a wetter climate creeps further and further down the island toward the sea?

In order to address this question, we began by counting the number of guava seeds in tortoise scat found from sea level up to 400 m elevation. We mapped the distribution of guava trees along the same elevation gradient. Finally, with an understanding of the conditions under which guava thrives and how the climate will change, we were able to build a model to predict how the area suitable for guava is likely to increase from now until 2070. Several thousand guava seeds can be found in a single pile of tortoise scat. Since tortoises feeding on guava in the humid highlands poot every day as they migrate to the lowlands, it was of little surprise to find guava seeds in tortoise scats at all elevations. So, if as climate models predict, the front of moisture creeps down each island towards the sea over time, it looks like there will be guava seeds ready and waiting in nutrient-rich “grow bags” of tortoise excrement. Other species, such as lizards and finches, also disperse guava seeds, but in far fewer numbers and over far smaller distances. It is the giant tortoises then that appear to be facilitating the invasion of one of the more disruptive alien invasive species in Galapagos.
by James Gibbs and Wacho Tapia, Leaders of GC’s Giant Tortoise Restoration Initiative

Perhaps that’s why Santiago is little-studied. Although we launched the Giant Tortoise Restoration Initiative (GTRI) in 2015, and planned to begin work on Santiago in 2016, we didn’t make it until 2018. The trips were delayed for various reasons (including the extremely dense thickets of vegetation). In June, we finally completed our first trip focused exclusively on Santiago tortoises (Chelonoidis duncan). This trip had a dual mission: 1) to open the access trail to Zone D — the closest giant tortoise nesting area to the coast, and 2) to evaluate the reproductive activity of Santiago giant tortoises there. We collected data that will help us, along with GNPD personnel, design a new strategy to accelerate the repopulation of Santiago with thousands of its giant tortoises. This tortoise species managed to survive for centuries, despite hundreds or thousands being removed by whalers and other sailors in centuries past as a source of fresh meat, followed by at least a century of negative impacts due to an immense population of introduced competitors (feral goats and donkeys) and predators (pigs that preyed on tortoise nests).

The little literature available on Santiago tortoises indicates a population of 500 individuals, dominated by males. Although we did not do an island-wide census during our short and limited visit, we were disturbed to find that the few adult females we encountered were very old. More than ever, it is urgent that we develop integral research and management actions to restore this population toward its historical number, similar to the restoration efforts for other populations, such as the Española tortoise, which was even closer to extinction.

During this intense and interesting trip, several things caught my attention. One of the most striking was that almost all the Opuntia cactus we observed were sub-adults or juveniles of about 10-12 years old, which coincides with the eradication of the feral donkeys. That made me wonder: If the donkeys had not been eradicated, would we be looking at an eventual extinction of the cactus?

In a few months we will return to Santiago to search for nests, collect eggs, and transfer them to the Tortoise Center on Santa Cruz. We can go knowing that we will find an accessible trail and even more importantly, we can rely on water collected during this goura (heavy mist) season in a tank we left for that purpose in Zone D. This will circumvent the need to transport all our drinking water from Santa Cruz and then carry it on our backs along with food and equipment. I look forward to the day when this island is covered with these giant reptiles that I have come to love and will continue to work to save.

*GC PROJECT UPDATE*
by Jon Whitman, Brown University Professor & Collaborating Scientist at the Charles Darwin Research Station

Whether the Galapagos marine ecosystem can rebound from the stress caused by El Niño is a key question that our research team is aiming to answer, with the support of Galapagos Conservancy, by monitoring bottom-dwelling communities of marine invertebrates and reef fish at 12 sites in the Galapagos Islands and by conducting underwater experiments. After a productive summer of dive-based research, our team, consisting of myself, PhD Candidate Robert Lamb, and undergraduates Maya Greenhill and Calvin Munson, returned to Brown University, while our colleagues Franz Smith and Alejandro Perez-Matus returned to New Zealand and Chile, respectively. We all brought back hard drives filled with pictures, videos, and data on the state of the subtidal marine ecosystem. We’re adding this most recent survey data to our 19-year baseline to test our roller coaster conceptualization of how the spectacular marine life of Galapagos rises and falls as it is impacted by El Niño – La Niña cycles (El Niño Southern Oscillation, or ENSO). With its unusually high temperatures and scarce planktonic food, El Niño represents the downhill phase of the roller coaster — a period of high stress potentially decreasing population numbers and the diversity of bottom-dwelling (benthic) organisms. The change in temperature causes the spectacular marine life of Galapagos to rise and fall as it is impacted by El Niño — La Niña cycles (El Niño Southern Oscillation, or ENSO).

The jury is still out since resilience, which depends on the intrinsic capacities of organisms to reproduce, recognize habitats, grow, and recover from stress, takes time to measure. By surveying permanent coral plots in January and in August this year, we found that more finger corals bleached and died during the strong 2016-2017 ENSO cycle than the massive coral species, Porites lobata, that resembles Chinese pagodas or flattened shingles. The overall rate of coral bleaching was lower than during previous ENSOs since 1999, which is curious, as the most recent El Niño was the strongest in this period. Some of the massive P. lobata corals bleached and recovered in 8 months (see photo below), demonstrating unusually high resilience.

The "barnacle booms" of the 2017 La Niña continued into 2018. As of early 2018, 83% of our monitored sites were in a barreled reef state where most of the rocky bottom down to a 15m depth was covered with big Megabalanus sp. barnacles. We think that these barnacle booms occur during La Niñas due to high reproduction when the phytoplankton that the barnacles eat becomes super-abundant. Since these barnacle booms occur during La Niñas due to high reproduction when the phytoplankton that the barnacles eat becomes super-abundant. Since these barnacled ustrates that we discovered during the January 2016 El Niño — an ulcerating skin disease affecting 18 species of reef fish, and a proliferation of rubbery mats of brown cyanobacteria across one third of the bottom at Cousins Rock — were short-lived and had virtually disappeared by our latest surveys in August 2018.

P lastics pose a serious threat to the wildlife of Galapagos. So it was great news when, on April 22nd as part of Earth Day celebrations on the Islands this year, the Galapagos Governing Council (GGC) passed a new resolution to restrict single-use plastics in the Islands, taking a lead in the fight against plastic pollution in our oceans.

With marine invertebrates and fish rebounding during La Niña, we think we’re seeing a rare type of resilience across the four human-inhabited islands. The GGC’s recent phase-out ban on single-use plastics in the Islands is a critical step towards a plastic-free Galapagos, but we must also ensure that local Galapagos communities and tourists recognize how their actions can contribute to solving the problem, and that sustainable and alternative solutions are readily available.

Together with our valued travel partner, Celebrity Cruises, we are supporting this effort by raising funds and awareness in the US and with Celebrity’s guests that visit the Islands. Our local partners, Grupo Eco Cultural Organizado (GECO) and Verde Milenio Foundation, undertake sustainable initiatives to reduce the amount of plastic being used across the four inhabited islands. GECO’s goal is for shoppers to adopt reusable bags made by local artisans. They give shop owners, who currently provide plastic bags, free, sturdy paper bags made from recycled materials, as long as they invest in and promote the locally-made reusable bags in their store. By charging $0.50 for each reusable paper bag, shoppers can make a one-off purchase to use each time they shop. This initiative is currently being tested in 250 stores across the Islands.

Verde Milenio Foundation is implementing a simple way to reduce disposable cups for hot and cold drinks. “Iguana Cups” are reusable and made of 100% recycled materials and were designed to promote a zero-waste model to locals and tourists through a deposit-return scheme. Customers pay $2 for the cup, which is then refunded to them if they give the cup back to any participating restaurant, easily identifiable by the initiative’s pink iguana posters. In addition to spreading the message to be proactive in protecting the Islands, with time, more and more individuals will lead by example and encourage community-wide behavioral changes.

The Galapagos people are taking a stand against plastics generated within the Islands, but the problem often originates from further away. Across the planet we can all take action in our homes and communities to eliminate single use plastics that can end up as trash on Galapagos shores.

Galapagos Conservancy and Celebrity Cruises have been jointly supporting local sustainability initiatives in the Islands since 2006.

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Plastics pose a serious threat to the wildlife of Galapagos. So it was great news when, on April 22nd as part of Earth Day celebrations on the Islands this year, the Galapagos Governing Council (GGC) passed a new resolution to restrict single-use plastics in the Islands, taking a lead in the fight against plastic pollution in our oceans.

With marine invertebrates and fish rebounding during La Niña, we think we’re seeing a rare type of resilience across the four human-inhabited islands. The GGC’s recent phase-out ban on single-use plastics in the Islands is a critical step towards a plastic-free Galapagos, but we must also ensure that local Galapagos communities and tourists recognize how their actions can contribute to solving the problem, and that sustainable and alternative solutions are readily available.

Together with our valued travel partner, Celebrity Cruises, we are supporting this effort by raising funds and awareness in the US and with Celebrity’s guests that visit the Islands. Our local partners, Grupo Eco Cultural Organizado (GECO) and Verde Milenio Foundation, undertake sustainable initiatives to reduce the amount of plastic being used across the four inhabited islands. GECO’s goal is for shoppers to adopt reusable bags made by local artisans. They give shop owners, who currently provide plastic bags, free, sturdy paper bags made from recycled materials, as long as they invest in and promote the locally-made reusable bags in their store. By charging $0.50 for each reusable paper bag, shoppers can make a one-off purchase to use each time they shop. This initiative is currently being tested in 250 stores across the Islands.

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Conservation of the Vermilion Flycatcher: Studying the Causes of its Decline
posted May 25, 2018
"This year, I began data collection for my master’s thesis on the vermilion flycatcher, an endemic bird of the Galapagos Islands, which has gone extinct on Floreana and San Cristóbal Islands and is rapidly declining on Santa Cruz. I spent most of my field time in the highlands of Isabela Island, within the Galapagos National Park, directly in the middle of nature — one of the reasons why I loved this experience...

We rose each morning with the birds, beginning our fieldwork at about 6 am. Our main activities included searching for new nests by walking through the study area and observing the behavior of the birds, checking the status of nests already located, and collecting nests once they were empty. We treated some of the nests with an insecticide to kill the larvae of the parasitic fly (the larvae suck the blood of the nestlings and cause high mortality), and observed the birds foraging to determine their main food items."

Author: Célina Leuba is currently doing her master’s degree in “Conservation and Biodiversity Management” at the University of Vienna, under the direction of Dr. Sabine Tebbich.

Promoting Healthy Pets and Responsible Pet Ownership in Galapagos
posted June 29, 2018
"On an island famous for sea lions that fill the beaches, lounge on benches, and nap on the front porches of waterfront buildings, one can begin to understand how species in the Galapagos Islands can peacefully coexist. San Cristóbal, like the other islands in the Galapagos Archipelago, is home to a vast array of wildlife that live harmoniously — seemingly unaware that this is a remarkable feat in today’s crowded world.

This scene provided an ideal backdrop for the recent Animal Balance campaign on San Cristóbal. It was our second trip to the island in the last 12 months, and a continuation of our 15 years of partnerships in Galapagos, working to provide sustainable, humane population management solutions for domestic cats and dogs...

The goal of the campaign, and the continuing work that Animal Balance is doing with our partners in Galapagos, is to provide a humane way to control the cat and dog populations while allowing these animals to live out their lives alongside the many native species that call the island home.

Author: Elsa Kohlbus has been with Animal Balance for six years, as a volunteer veterinary technician and, for the past year as a staff member, serving as Communications Director and now as Program Director.

An Explosive Trip to Isabela: New Potential Nesting Sites for Galapagos Penguins
posted September 18, 2018
"Our research team visited Elizabeth Bay on Isabela Island in July 2018 to see if the Galapagos penguins were breeding and to look for individuals we had web-tagged on previous visits. As if leaping from our boat to the shore to catch a penguin, crawling through tight lava tunnels to look for chicks, and seeing a penguin carefully brood its new egg aren’t thrilling enough, we had an additional source of excitement this trip: Sierra Negra, one of the colossal volcanoes of Isabela, was erupting.

When we heard that Sierra Negra was erupting just before our July trip, and that there had been two 5.3-magnitude earthquakes associated with the eruption, we were concerned about the penguins that nest in Elizabeth Bay. How many of their nests would collapse due to the earthquake? Would the constructed nests that we built for them in 2010 be strong enough to withstand the tremors?"

Author: Caroline Cappello, Godfrey Merlen, and Dee Boersma make up the dedicated research team that has traveled to Galapagos penguin breeding areas twice a year since 2010 to check both natural and constructed nests and study the penguins.

Learning More About the Mysterious Galapagos Martin
posted November 5, 2018
"As an ornithologist and a lover of all things Galapagos, my focus is to conserve and protect the unique birds of these islands. My current goals include getting to know one of the most mysterious and elusive birds of the Archipelago, the Galapagos martin. This bird, endemic to Galapagos, is closely related to the purple martin. The Galapagos martin has never been studied. We don’t know how many individuals exist in the Archipelago and whether they are threatened. It’s a difficult species to study as it is rarely seen and, when it is, it is usually found on hard-to-reach sea cliffs and hilltops.

In July 2017, with the support of Galapagos Conservancy, I was able to search for and count Galapagos martins on the shore and sea cliffs throughout much of the Archipelago during the blue-footed booby census. We only managed to see about 30 individuals and identify three potential breeding sites. I could not estimate population size with this technique, but the discovery of the breeding sites was vital to furthering our understanding of these elusive birds.”

Author: David Anchundia, a native Ecuadorian, has been working as a researcher on the Landbird Conservation Project at the Charles Darwin Foundation since 2015. He completed his Master’s degree with Dr. Dave Anderson of Wake Forest University on blue-footed boobies. David first started working in Galapagos in 2008 and is passionate about finding ways to ensure the long-term protection of the unique birds of Galapagos.

Above, left: Dr. Fernando Villa, the new vet on San Cristóbal, with a canine patient in Galapagos. © Animal Balance
Above, right: The population size and health status of the Galapagos martin is currently unknown. © David Anchundia, CDF
Just above: A male Galapagos penguin protects its egg in one of Dee Boersma’s team’s constructed nests in July 2018. © Dee Boersma
DECADES of SUPPORT for GC

The Galapagos Conservancy donors listed below comprise a very special group of people. Through their impressive donation history, these donors have proven their amazing dedication and loyalty to the cause of conserving the Galapagos Islands. They know how the issues in Galapagos have changed over the years, and they have witnessed Galapagos Conservancy evolve and grow to adapt to those changes. They have stuck with us, and we humbly thank and recognize our 30-year and 25-year donors for their decades of support. We are grateful!

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Jean Bangham
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Ken & Mary Battershill
Myrna Wilson

2018 YEAR END $500,000 MATCHING GIFT CHALLENGE

Dear Friends of Galapagos,

One of our most generous long-time supporters has offered to match every gift we receive from dedicated partners like you before December 31st — up to a total of $500,000.

If you are considering making a year-end contribution to Galapagos Conservancy, I hope you will respond soon. This is an amazing opportunity to make your gift go twice as far for the Galapagos Islands and their rare and remarkable wildlife.

When combined with these critical matching funds, your tax-deductible gift will have double the impact on Galapagos Conservancy’s ongoing efforts to return giant tortoises to their historic numbers and distribution … continue the recovery of the Galapagos penguins … reduce the impact of harmful invasive species … educate the future leaders of Galapagos … and provide needed resources to make up for ongoing funding shortfalls at the Galapagos National Park Directorate.

I urge you to return your gift to Galapagos Conservancy today. We must receive it before December 31st for it to be matched 100% and to be eligible for a 2018 tax deduction. Thank you, in advance, for your continued support!

— Johannah Barry and the GC Staff

Thank you to all of the talented photographers who submitted their stunning images to our annual photo contest! The GC team had a difficult task choosing the winners among more than 2,000 photos. Here is a sampling of some of the best, which you can find in our 2019 calendar. See details at right.

2018 PHOTO COMPETITION

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2019 Galapagos Calendars, $15

Featuring stunning photos from the winners of our 2018 photo competition.

www.galapagos.org/shop/

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 $25. Recipients will receive a beautiful card informing them of your gift, which you can personalize with a special message.

Books

Ranging from $15 up to $50, we offer a limited selection of Galapagos books for all ages, while supplies last.

2018 PHOTOS

Great Frigatebird Male on Genovesa by Bill Yetz of Sauvage, MA
Marine Iguana by Goston Bonnudi Paz of Shanghai, China
Black-Knapped Reef Shark at Darwin by Gregory Amber of Stanford, CA
Great Blue Heron with Sea Turtle Hatchling by Harris Nguyen of Laguna, OH
Sea Lion Pup by Dianne Logan of Monrovia, CA

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

GALAPAGOS CONSERVANCY
2018 PHOTO COMPETITION
Congratulations to our 2018 Photo Contest winner, Jem Dodia!

Hailing from Santa Cruz, Galapagos, Jem won for this shot of young marine iguanas on Isabela Island. This photo, chosen from nearly 2,000 entries, dons the cover of our 2019 calendar.

2019 calendars can be ordered online at: www.galapagos.org/shop/