



GALAPAGOS news

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Connecting people across the globe with conservation in Galapagos



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Photo Contest 2012

A sea lion roars for the camera of Srdjan Mitrovic of Atherton, CA, one of Galapagos Conservancy's Ambassador members and a winner in GC's 2010 annual Calendar Photo Contest. See the back cover for details on the 2012 Photo Contest, which is underway now.



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Galapagos News is a twice-yearly publication that is produced for Galapagos Conservancy supporters and friends. Galapagos Conservancy is part of an international network of Friends of Galapagos organizations (FOGOS). All of these non-profit organizations support conservation in the Galapagos Islands, and they are listed below:

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REBUILDING GALAPAGOS

After the Tsunami

Spring/Summer 2011

In the wake of one of the worst natural disasters on record, the devastation faced by the people of Japan over these last two months is difficult to describe. The tsunami damage to life and infrastructure is incalculable, but despite the mounting tragedies, the Japanese people remain resolute, calm, and generous in spirit. We keep them in our thoughts.

The Galapagos Islands, in many ways a sister archipelago to Japan, were also impacted by the tsunami with initial damage to the Charles Darwin Research Station (CDRS) confined to buildings and equipment. We immediately reached out to our donors and supporters who responded with extraordinary generosity, providing us with **more than \$115,000** to support the rebuilding efforts at the CDRS in Galapagos. The funds will not only help rebuild infrastructure but will put scientists and Park rangers into the field to assess damage to coastal animal populations, including mangrove areas, turtle nesting beaches, marine iguana nesting areas, and penguin and cormorant nesting areas. Station scientists will look at impacts on corals in the wake of the tsunami and set up baseline studies to measure their health over time. The effect on bottom dwelling marine species is unknown, and the status of sea bird populations such as albatrosses is of immediate concern.

In this issue of *Galapagos News*, we focus on the important work of data collection and the efforts to build a durable and accessible information system to store and retrieve countless data sets collected since Charles Darwin's visit in 1835. Galapagos has often been described as a "living laboratory" of biological processes, and in even more ways is a "living library" of biophysical data. Since Darwin's visit, Galapagos has inspired scientific inquiry, and data from those countless investigations are scattered throughout the world in academic institutions, museums, and libraries.

But as the pressures on Galapagos biodiversity grow, decision-makers in Galapagos and in Ecuador require access to a wide range of information, ongoing research, and socioeconomic data — both current and historical.

Over the last several years, Galapagos Conservancy has funded the work of Frank Bungartz and others at the Research Station to begin to build these data systems. In this issue, Bungartz shares with us his efforts to compile the first Galapagos biodiversity information system for all known Galapagos species. We share his belief that good conservation policy must be grounded in robust and accessible data.

Readers will also be introduced to Scott Henderson's work on coffee production in Galapagos, an agricultural pursuit with both ecological and economic benefits. Fritz Trillmich's more than thirty years of sea lion studies will bring readers closer to understanding what he calls their "secret life."

As Galapagos rebuilds from the tsunami, we are reminded of the resilience of nature and the ability of systems to recover from assaults, either man-made or natural. So too, the human spirit does recover. We were particularly touched by one of our Japanese donors last month, who responded to our update on the tsunami with a generous gift. This kind and gracious act reminded us all that we are linked inextricably to one another. Our world, while complex, is still small.



For Galapagos,

Johannah E. Barry
President of Galapagos Conservancy

Cruise with Galapagos Conservancy

Let the Experts Lead the Way ♦ July 12 – 22, 2012

Join GC's own Science Advisor, Linda Cayot, and naturalist extraordinaire, Richard Polatty, as we set sail aboard the *Integrity*, a 16-passenger, 141 ft. luxury yacht. Special guests and tours set our trip apart from the rest. Details and a downloadable brochure can be found on our website at



www.galapagos.org Call our office at 703-383-0077 or email rfuhrken@galapagos.org with questions. A \$1500/person non-refundable deposit is required to reserve your spot. Passengers must be 8 years or older.



GC's Linda Cayot (left) talks tortoises at the Charles Darwin Research Station. Photo by traveler, Joachim Frank.

NOT ANOTHER BOOBY. . .

The Blue Glaucus (*Glaucus atlanticus*) is found in the Atlantic, Indian, and Pacific Oceans, which means there's a chance you might run into one in Galapagos. It can grow to 3 cm in length and has dozens of so-called "cerata," outgrowths that give the creature a nasty sting. It will feed on jellyfish, the Portuguese Man-O-War, and even other members of its own species, recycling their venomous cells and deploying them to the tips of its cerata for its own defense. Aided by a little air stored in its stomach, the Blue Glaucus floats upside down, drifting wherever the winds and currents take it with its slug-like "foot" on the sea's surface. Its blue underside (which is directed towards the sky) may help camouflage it from sea birds and its silvery grey back (which faces downwards) may disguise it from predatory fish beneath.

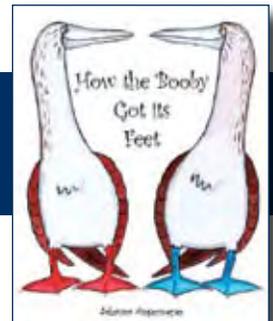
This strange species was first formally described in 1777 by naturalists on board *HMS Resolution*, during Captain James Cook's second voyage to the Pacific.

© Frank Bungartz



BOOK REVIEW

HOW THE BOOBY GOT ITS FEET
by Johanna Angermeyer
Pelican Press (2010)
\$12.00, ISBN 9780954485122



Following publication in 2009 of *Is Your Mama an Iguana?*, *How the Booby Got Its Feet* is the author's second book for young children featuring some of the unique and colorful animals of Galapagos.

The brightly colored feet, the comical name, and antics of this unforgettable bird are all captured in the compelling storyline of how Basil the Booby ingeniously convinces the other Boobies to color their feet. The enchanting and color-rich illustrations, so beautifully and imaginatively crafted by the author herself, complement the text perfectly.

This story will appeal to readers of three years and up. My own grandson of two-and-a-half was captivated. Some readers will enjoy the back page of "Booby Facts", with such nuggets as "male boobies whistle and the females honk." Older children will hopefully be influenced by the conservation message of respect for Galapagos wildlife that is so amusingly, but thoughtfully, woven into the storyline of this delightful book.

Reviewed by Jenny Day

How the Booby Got Its Feet and *Is Your Mama an Iguana?* are on sale now for \$12 each at www.galapagos.org



NEWS FROM GALAPAGOS

PROVIDED BY THE CHARLES DARWIN FOUNDATION & THE GALAPAGOS NATIONAL PARK SERVICE

New Company for Lonesome George

There has been an exciting turn of events for Lonesome George, the sole-surviving giant tortoise from Pinta Island who has been in captivity at the Charles Darwin Research Station since 1972. The Galapagos National Park Service (GNPS), the institution responsible for this emblematic tortoise, has decided it's time to introduce a new pair of females into his enclosure.

Back in the early 1990s, after almost 20 years in solitary confinement, George was joined by two females collected from Isabela Island's Wolf Volcano, where the population most morphologically similar to George lived. But recent genetic research carried out by a team of scientists at Yale University revealed that George is, in fact, most closely related to the tortoises from Española. With the new information in hand, the GNPS removed the two Wolf tortoises and replaced them with two Española females. Park officials are hopeful that providing George with females closer to his own genetic makeup will eventually result in hatchlings.



Cleaning up Puerto Grande on San Cristóbal Island after the tsunami © GNP

Tagging Marlin

The CDF will launch an exciting new project to tag and track large pelagic fish in the Galapagos Marine Reserve and the wider Pacific Ocean. The study will begin by concentrating on Striped Marlin (*Tetrapturus audax*) and Wahoo (*Acanthocybium solandri*), with the aim of working out the proportion of their life cycle they spend in the protected waters around Galapagos and identifying the location of their feeding and breeding grounds. This project will complement existing work on tagging and tracking sharks. "All these species are top predators in the marine ecosystem," says CDF marine scientist Anna Schuhbauer. "Their feeding patterns are crucial to maintaining balance among the different layers of the marine food chain," she says.



© CDF

Avian Pox Arrival

It's official. The avian pox virus reached Galapagos in 1898, say researchers from the US and Ecuador. This estimate is vital to understanding avian diseases that affect today's Galapagos birds, says Patricia Parker, a geneticist at the University of Missouri–St.

Tsunami Impact

The tsunami triggered by the Japanese Earthquake on March 11 caused damage to low-lying areas in Galapagos.

The waves struck at high tide on March 11, resulting in seawater reaching 1.7m above the normal high-water mark, flooding the Charles Darwin Foundation's (CDF) marine laboratory, among several other buildings. "The waves completely destroyed a concrete pump house and broke massive wooden doors, flooding laboratories, workshops, and storage facilities, scattering furniture and equipment," said CDF executive director Dr. J. Gabriel Lopez.

Before the tsunami arrived, the Galapagos National Park (GNP) had closed all visitor sites and both Galapagos residents and tortoises housed at the Charles Darwin Research Station, including Lonesome George, were evacuated to higher ground as a precaution. The Finch Bay Hotel and the Red Mangrove Inn suffered serious damage, as did a few visitor sites on Santa Cruz and San Cristóbal Islands and municipal buildings along the water's edge.

Rat Eradication

The effort to eradicate introduced rodents from several Galapagos Islands is now under way, the first initiative of its kind in South America.

In 2008, a pilot project, in which poisoned bait was dispersed by hand, succeeded in eliminating rodents from North Seymour, a small island of less than 2 km². Phase 1 of this ambitious new plan involved the dispersal of bait from a helicopter over

several small and medium-sized islands, including Rábida, Bartolomé, the Beagle Islets, and the Bainbridge Rocks.

The GNP, with the support from international non-governmental organizations (NGOs), academia, and industry, delivered two doses of poisoned bait at seven-day intervals to increase the likelihood that all rodents would consume some. Since there was a chance that Galapagos Hawks, which may feed on rodents, could be inadvertently harmed, twenty individuals were captured from two of the target islands on which they are present and were held in captivity until it was safe to return them.

There are three types of introduced rodent in Galapagos: black rats, Norway rats, and house mice. These species can have an adverse effect on the reproduction of tortoises, iguanas, and land and sea birds, especially the Galapagos Petrel, which nests in the humid zones of the larger islands. This effort will bring GNP one step closer to the complete ecological restoration of these sites.

© GNP





Louis in the US. She and her colleagues inspected the skins of several thousand finches and mockingbirds collected in Galapagos between 1891 and 1906. All of those specimens with skin lesions typical of infection date from 1898 or later, they report in the scientific journal *PLoS ONE*. In addition, it appears as though the virus was much more likely to be found on human-inhabited islands, suggesting that humans inadvertently helped it to spread.

Condos for Penguins

Some 120 new homes have been built along the pristine coastline of three Galapagos Islands, though the intended inhabitants are not humans, but penguins. "Our goal is to increase the population of Galapagos Penguins, and the way to do that is to make sure that when conditions are good, when they're not food challenged, that all of them will be able to breed," says Dee Boersma, a researcher at the University of Washington in the US.

Shark Migration Record Set

The Charles Darwin Foundation (CDF), a member of the Migramar network of scientists focused on the Eastern Tropical Pacific (ETP), and the Mexico-based research group, Pelagios, have identified a new shark migration record for this region. In April, the Pelagios team found records of a silky shark (*Carcharhinus falciformis*) in the surrounding waters of Clipperton Island, 2,200 km from its tagging location at Wolf Island in the Galapagos Marine Reserve (GMR). This is the current record for shark migration in the ETP monitored by the Migramar network.

The record-setting female silky shark, measuring 1.9 m in total length, was tagged with an ultrasonic chip near Wolf Island in March of 2010. The shark remained in GMR waters for approximately two months where it was last detected on May 1, 2010. Since then, its whereabouts remained unknown until its September 18, 2010 detection off Clipperton Island, where it remained for one month.

Alien Plant Survey

Botanists at CDF have put together the most comprehensive inventory to date of introduced vascular plants in the inhabited areas of Galapagos. Between 2002 and 2007, they surveyed more than 6,000 properties on the inhabited islands of Floreana, Isabela, San Cristóbal and Santa Cruz and recorded 754 alien vascular plant species, a substantial increase on the last count. A repeat of the survey in the future will act as an effective early detection tool to help avoid further invasion of the Galapagos National Park, suggest the scientists in an article published in the scientific journal, *PLoS ONE*.

GNPS Suspends Hotel Construction at Punta Estrada

Investors Mauricio Ponce Cartwright and Antonio Noboa Ycaza began construction in an environmentally sensitive area of Punta Estrada in Puerto Ayora, Santa Cruz, with municipal permits to build a "private residence." They subsequently asked the Ministry of Environment to analyze a feasibility study to operate a 26-room hotel in the same building.

Learning of this situation, the Galapagos National Park Service (GNPS) ordered the immediate halt to construction because the project failed to adhere to two existing regulations, including the Law for Environmental Management, which requires special permission from the Ministry of the Environment for all projects which could pose risks to the environment.

Additionally, Article 49 of the Special Law for Galapagos states that construction of new tourism infrastructure requires authorization from the Governing Council of Galapagos. It also states that there must be minimal impact to Galapagos ecosystems through an environmental impact study and environmental management plan.

On March 25, the GNPS ordered the immediate halt to construction and asked the Municipal Government of Santa Cruz to use its authority to support this order. The property owners have retaliated with legal proceedings against the GNPS.

Many Galapagos residents have expressed their opposition to the builders, staging a peaceful protest at the construction site and organizing a rally that coincided with a visit from Ecuador's President Rafael Correa. In an article published in *The Huffington Post*, Galapagos-born journalist Cecilia Alvear reported that one organizer summed up residents' feelings, "We want the authorities to respect and enforce the laws. We want them to help us live a good life in a sustainable way that does not harm this wonderful place. We will no longer stand by and see the law and our rights ignored."

Ringing the Albatross

Park wardens and scientists have fitted Waved Albatrosses with geolocation devices, which should help solve a long-standing mystery. This species breeds on Española Island between April and December, but their movements during the non-breeding season are not so clear. The devices, fitted to almost twenty individuals before they left Galapagos, will be removed in May when the birds return and scientists will be able to analyze their movements in detail.



Municipal permits were obtained to construct a "private residence," but this appears to indicate a large hotel.



Clockwise, from left: A small, fragile fungus (*Marasmius cladophyllus*) in the humid highlands of Santa Cruz; Galapagos Flycatcher on Isabela's Darwin Volcano; *Gossypium darwinii* in the dry zone of San Cristóbal.
© Frank Bungartz

Towards a Census of Galapagos Life

Frank Bungartz

Frank is an expert in the taxonomy and ecology of lichens. As the leader of Biodiversity Assessment at the Charles Darwin Foundation (CDF), he is responsible for establishing the Galapagos Species Checklist, the first online biodiversity information system for all known Galapagos species.



An unidentified fungus in the humid highlands.

© Xavier Arturo

Biodiversity is life, the variety of species inhabiting our earth. From microscopically tiny bacteria to giant whales, food crops as well as their diseases, and slime molds every bit as much as butterflies. We are all part of this intricate web of life, part of a community of species that together inhabit this planet. Yet, when we talk about biodiversity, how much do we actually know?

One might assume that today, centuries after the first explorers set out on their voyages of discovery, we have identified a good proportion of the species that inhabit our planet. But this is far from the case, with most estimates suggesting we may only have accounted for a fraction of all species. Our grasp on the extent of biodiversity is particularly poor in the tropics, where we have barely scratched the surface, and scientists continue to make exciting new discoveries every day.

Galapagos is no exception. On these Islands, where there has been a human presence for centuries, there is still much to be discovered. After all, if a species as striking as the pink iguana on Isabela's Wolf Volcano can go unacknowledged until as recently as 2009, how many of the less conspicuous invertebrates, fungi,

and marine organisms have yet to be described?

But in spite of these vast gaps in our knowledge, the intense scientific interest in Galapagos over the last 50 years still makes it one of the best-studied tropical archipelagos in the world. This fact, in concert with the relatively simple system that is typical of a remote, isolated island chain, makes Galapagos particularly valuable. Here, it should be possible to come to grips with this small ecological framework, to study complex ways in which different species interact, and to develop sound conservation strategies that will help to preserve entire ecosystems rather than just single species.

In 2007, the CDF therefore decided to embark on an ambitious task: to produce the first complete inventory of all known Galapagos species to allow us to assess what we already know and where the critical gaps in our knowledge lie. We began at the Charles Darwin Research Station, home to one of the most representative natural history collections of the archipelago: specimens of plants, fungi, invertebrates, and vertebrates, of both terrestrial and marine species. In addition, our library comprises one of



Reviving the Highlands with Conservation Coffee

Scott Henderson

Scott is a conservation and marine management practitioner, supervising technical and financial aspects of marine projects in Galapagos and further afield in Costa Rica, Panama, Colombia, and mainland Ecuador. He lives in the Galapagos Islands with his Ecuadorian wife and son.

For many of us, whether at home in the kitchen or standing in line at your local café, coffee plays a satisfying part in our daily lives. But for me and my family, growing, processing, and roasting coffee in Galapagos is what we do. For us, coffee is about much more than a small, homespun business and fascinating hobby. It is a chance to provide a working model for how sustainable agriculture can help rebuild the heavily degraded Galapagos highlands.

I first came to the Galapagos Islands in 1983 as a 20-year-old biology student at Washington and Lee University in Virginia. Like my fellow trip-mates, I sought the thrill of adventure, looking forward to diving in virtually undived waters and walking through the stark, uninhabited lowlands surrounded by the strange, fearless creatures for which Galapagos is so famous. But as our dilapidated truck-cum-bus crossed the highlands en route to Puerto Ayora, we forded streams swollen with intense El Niño rains and plowed through deep mud wallows that divided deep green pastures from lush, thick forests. I had no idea that such a wet and fertile other side existed in Galapagos, much less an inkling that more than two decades later I would be living and growing coffee here.

Coffee has had a dark history over the past five centuries, including driving the slave trade, fueling massive deforestation of native ecosystems, and tipping the balance of power in favor of land barons, oligarchies, and dictators. The introduction of coffee to Galapagos is no exception. Although some coffee may have been present when Charles Darwin visited the Islands in 1835, the first reliable record of cultivation is on San Cristóbal in the 1870s. This plantation and other later coffee enterprises on Isabela exploited convicts sent out from the Ecuadorian mainland, many supposedly exiled simply for being on the wrong side of the political fence. This forced labor first eliminated native forests and then grew and processed the coffee. Conditions were so bad on San Cristóbal that workers revolted and killed the plantation owner in 1904. On Isabela, in addition to growing coffee, prisoners were made to build a pointless structure that became known as the “Wall of Tears.” As more people began to settle in Galapagos from the 1950s onwards, coffee cultivation became relegated to ever-smaller plots, mostly for personal consumption and local trading.

It was not until the 1990s, as the market for “specialty coffee” began to take off, that the Galapagos coffee industry made something of a resurgence. With all varieties grown in Galapagos being high quality ‘arabicas’ and given the rich, volcanic soils and peculiar climate that make for ideal growing conditions, it made good sense to revive this lost practice. In direct contrast to its dark past,

(Continued on page 10.)



Top: View of Puerto Ayora from the highlands of Santa Cruz.

Middle: Coffee production, from the freshly picked coffee berries (left) to the roasted coffee seeds or “beans” (right).

Bottom: Galapagos coffee (Coffee arabica) in bloom. © Scott Henderson



Fritz Trillmich is a professor of animal behavior at the University of Bielefeld in Germany and has been studying Galapagos sea lions and fur seals (among much else) for more than 30 years.



© Vanessa Green

The Secrets of the Sea Lion



A Colony of sea lions on Caamano (top) and sea lion youngsters attempting to suckle from a lactating female (bottom).

© Fritz Trillmich

If you've ever been fortunate to snorkel or dive in Galapagos, the chances are that you have come face-to-face with a sea lion. When its whiskers first pop up in front of your mask, it can be a startling experience. But you soon marvel as the animal gracefully dives away under you, turning and twisting so elegantly that you feel like an awkward intruder in its underwater world.

Although the Galapagos Sea Lion (*Zalophus wollebaeki*) is endemic to the islands, it is very commonly encountered by residents and tourists alike. Yet in spite of its abundance (the population fluctuates between 20,000 and 30,000 individuals), there is still a lot to find out about this delightful creature. Since 2002, I have been involved with a study of sea lions on

Caamano, a tiny islet not far from Puerto Ayora and home to one of the largest sea lion colonies in Galapagos with nearly 1,000 animals. It is here on a rock about 300 meters across that we have begun to understand some of the sea lion's enduring secrets.

One of the most striking features of such a dense colony is the noise, particularly during the cold season between September and January when most pups are born. New mothers must go on frequent foraging trips and when they return to the islet, they and their pups use calls (and also smells) to identify each other. Since it takes between two and three years for a youngster to become completely weaned, these barking calls are a near-constant feature of life on Caamano.

During this extended period of nurture, juvenile sea lions will often sneak up on other females and attempt to steal their milk. Most mothers guard their milk supplies closely, but by displaying overtly submissive behavior some juveniles are able to convince them to give up some of their valuable supplies. Although this obviously benefits the youngster, it may actually benefit the female, as well, if the two are related. To explore this possibility, we studied the community structure of sea lions on Caamano and found that in any

(Continued on page 10.)

Continued from pg. 8 – COFFEE

Galapagos coffee is now providing social benefits. It can also be grown alongside native species, providing a means to improve the integrity of the highland ecosystem.

Although more than 100 km² of Santa Cruz highlands are reserved for cultivation (as are similar areas of Floreana, San Cristóbal, and Isabela), agriculture simply cannot compete with the incomes generated by the lucrative tourism sector. Cattle ranching can still turn a profit, but it requires eliminating almost all the natural forest cover and native ground species, so it comes at a considerable cost to the highland ecosystem. Coffee, by contrast, grows exceptionally well under native tree cover, alongside Galapagos bushes and surrounded by low-lying native vegetation. With plenty of native pollinators like moths and bees and few insect pests, organic cultivation is easily achievable, bringing benefits to the environment, farmers, and consumers alike. Most encouragingly, the good prices that gourmet coffee can fetch means it's possible to afford the costs of relatively expensive labor, the removal of harmful invasive species, and gradual restoration of this important habitat.

Thus was born our little enterprise now known as “Lava Java.” With the money we have made from our organic “conservation coffee” production, we have reforested 100,000 m² and now employ three full-time workers. Most importantly, we have helped put Galapagos coffee on the international specialty coffee map and provided a working example of how growing it can be both profitable and environmentally beneficial. As members of the local coffee growers' association, we see other producers as allies, members of a swelling group of responsible land stewards that appreciate the importance of the natural environment of Galapagos.

So, as we have that first cup in the morning looking off our balcony over our forested coffee, beyond Puerto Ayora and over the broad, glistening Pacific, we savor far more than the taste of exceptional, fresh coffee: we savor the vision of a Galapagos where people and the environment can exist in harmony. 🌍

**Galapagos Conservancy will be selling
Lava Java at www.galapagos.org later this year.**



*Henderson's end-product, Lava Java, with his coffee plantation in the background.
© Scott Henderson*

Continued from pg. 9 – SEA LIONS

given area females are more closely related to each other than would be expected by chance. We also found that those females that interacted most regularly were most closely related to each other. This strongly suggests that females will usually breed at the same site, perhaps selecting the beach on which they themselves were born.

Strangely, given their dominant presence, we know much less about male sea lions. When the animal you met snorkelling was a male, it may have startled you by barking under water, expelling bubbles as it did so. Intrigued, we decided to find out more about the very conspicuous territorial behavior of the male Galapagos Sea Lion and by taking small skin samples from the Caamano population, we were able to work out which males sired which pups.

In most seal species, males guard their territory because it increases the chance of mating with females in the area. This is also the case for the Galapagos Sea Lion, but only to a limited degree. Although dominant males fathered more offspring than other males, territoriality is a costly business. Territorial males have to spend so much of their time in the water defending their territory that they cannot prevent smaller males from sneaking the occasional mating. Furthermore, during the peak of breeding they are so busy defending their patch they may not feed for several weeks at a time.

In an El Niño year, when the abundance of fish declines, the strain on territorial males is much greater; if they have been fasting for a long period and have become quite lean they may even die. If these events were to coincide with an outbreak of disease or active persecution by humans, it could prove disastrous. So, as attractive as the Galapagos Sea Lion might be, we must keep a respectful distance to ensure that we do not introduce diseases from the mainland as a result of previous contact with domestic or wild animals. Thankfully, this should not detract from our appreciation for this wonderful creature. 🌍



Galapagos Islander

Victor Carrion . . .

... has worked his way up through the ranks of the Galapagos National Park Service (GNPS) over almost two decades and has witnessed extraordinary change in the archipelago. He has held many posts within the organization and is currently the Technical Coordinator responsible for the eradication of invasive species.

What is the GNPS?

It is the organization responsible for the management of the Galapagos National Park, which encompasses 97% of the land area of Galapagos. With four ocean-going patrol ships, ten smaller vessels, and one amphibious airplane, the GNPS is also responsible for management of the 133,000 km² of ocean that constitute the Galapagos Marine Reserve.

GNPS operates under the auspices of Ecuador's Ministry of the Environment. Its headquarters are located on the island of Santa Cruz, while the Park also runs three smaller satellite offices on Isabela, Floreana, and San Cristóbal. It currently employs 278 park rangers who work in administration and in the field. The majority of park projects are government financed, while a few projects are financed by non-governmental organizations, including Galapagos Conservancy.

How did you come to work for the GNPS?

I have a degree in Education in Ecology and Environmental Science. In 1994 I began working for the GNPS as a Conservation Officer in the Technical Office on Isabela. In 1998, I moved to park headquarters on Santa Cruz to work on hunting management. A few years later, I took over the responsibility for the eradication of invasive species and was heavily involved in Project Isabela, which achieved the remarkable removal of goats and donkeys from Santiago and Isabela.

Describe the difficult period for the organization in the early 2000s.

The position of Director was particularly unstable in 2003 and 2004. Frequent changes in national and local government resulted in several changes in the leadership of the GNPS. In 2004, when I was appointed Director for a period of two months, I had a chance to see first-hand how the interests of the national park were being dealt with.



Victor Carrion (above) played a central role in the removal of goats in Project Isabela.

How have things improved since then?

We now have a national government that believes the administration and management of the Galapagos Islands are important. There is also greater stability in local government posts, and environmental issues are now taken more seriously. A new Special Law for Galapagos, which is currently being drawn up, will make important changes to the administration and management of Galapagos that should help safeguard the GNP. However, the situation could change if another government were to come into power.

What do you consider to be the GNPS's most important achievements over the last few years?

One of our most important achievements has been the introduction of a new form of itinerary for tourist boats. Cruises will now operate on a 15-day itinerary, which makes it possible to avoid over-crowding at visitor sites by reducing the total number of visits per day.

We are also currently conducting a pilot project to eradicate rodents from several small and medium-sized islands. Helicopters were used for the first time to disperse the bait in solid form. The experimental procedure will be repeated on larger islands in future years. The challenge will be to ensure we have enough funding to follow this through on all of the islands.



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GALAPAGOS CONSERVANCY

Saving one of the world's great treasures

MEMBER'S CORNER

Galapagos Conservancy has expanded our grants program to include important projects by researchers and non-governmental organizations (NGOs) in our three main focus areas: *ecosystem restoration, sustainable society, and knowledge management*. These projects include species-focused work by long-time Galapagos researchers, as well as projects carried out by local NGOs focused on improving education and citizen participation in the islands. The following projects are approved for 2011:

Dr. Hernan Vargas, a native of Galapagos currently running the Latin American program of The Peregrine Fund, and his Ecuadorian graduate student will be completing the third year of a **hawk study** on Santiago — focusing primarily on the impact of goat eradication on the feeding ecology of the hawk population. This will provide important information on changes in native systems since the successful eradication of goats from the island.

Dr. James Gibbs, our collaborator from SUNY-ESF in Syracuse, New York, who supervised a **survey of Española in 2010** and the follow-up monitoring of the tortoises released onto Pinta in May 2010, will conduct a pilot project focused on developing a system to help the Park control tortoise poaching in the southern volcanoes of Isabela.

Dr. David Anderson, a professor at Wake Forest University in North Carolina who has worked on boobies, albatross, and other bird species in Galapagos since the early 1980s, will oversee a large-scale **blue-footed booby survey** to develop baseline data on bird numbers and distributions to help determine if anecdotal reports of declining populations are real. If a declining trend is demonstrated, this survey will help the Galapagos National Park develop management protocols for blue-footed boobies.

FUNDAR Galapagos, a non-profit organization in Galapagos, will work to establish a **Citizens Watchdog Group** focused on the enforcement of environmental laws and regulations and the provision of public services. This group will also work to increase the participation of local citizens in political processes and to identify and strengthen the capacity of positive leaders who can help foster constructive interactions between the public sector and civil society in Galapagos.

Over the next several months the Fundación Scalesia, a Galapagos-based organization which oversees the model Tomás de Berlanga School in Santa Cruz, will work with Galapagos Conservancy staff, our colleagues at ISS Partners, and a group of international educators to help strengthen the school's educational program and financial sustainability. The project will also develop mechanisms that will help it to serve as a **model for Galapagos education** that can be expanded to other schools and other islands.

DONOR SPOTLIGHT

Dan Sherman of Lafayette, CA

Dan Sherman's interest in Galapagos began in the '90s while he was a graduate student studying genetics at the University of California, San Diego. An amazing visit to the islands with friends and family in January 2002 sparked his desire to help conserve the islands.

Dan began his support of Galapagos conservation by making a donation to Galapagos Conservancy immediately following his 2002 trip. In 2004, he picked up the phone and called our offices to learn more about our specific programs. Since then, he has always been ready to share ideas or talk science or strategy.

Last year, Dan contacted us to see how he could complement his monetary contributions with volunteer work – he was even willing to stuff envelopes for our mailings! But as we began to talk about GC's new programs, it became clear that Dan's



greatest contribution could be made by sharing his considerable understanding and experience in the area of information organization and management. During the beginning stages of our Knowledge Management Initiative, we asked Dan to help with some much-needed background research, including a literature review of best practices in inter-institutional knowledge management initiatives around the world. In April, Dan met with GC staff and other experts to discuss how to apply his findings towards a Knowledge Management System for Galapagos.

Dan's efforts are helping Galapagos Conservancy and its partners to take our first big steps in this important area of our conservation agenda; he will continue to play an important role as advisor throughout the project. More than just a loyal donor, Dan is an active partner in our work to conserve Galapagos.

Dan and his wife Katy Donaldson, also a PhD geneticist, dream of one day spending an extended period of time in Galapagos with their children, while offering their expertise in genetics to benefit conservation. For the future of Galapagos, we hope Dan's dream comes true.

NOTES FROM THE FIELD

AN UPDATE ON GC'S 2010 GRANTS

PINTA Elizabeth Hunter, a Masters degree student studying under Dr. James Gibbs at SUNY-ESF in Syracuse, New York, led a team of three intrepid students on a two-month trip to Pinta Island, first to participate in the historic release of 39 tortoises in May 2010 and then to continue monitoring them during their first two months on the island. Along with examining the foraging patterns of the tortoises, Elizabeth and her team studied their movements in relation to sex (*see map at right*) and carapace type. Elizabeth is returning to Pinta this May for another two-month stay. She will be accompanied by three field assistants from the US and a college-bound Galapagueño, son of a long-time park guard. This follow-up will include collecting data from the GPS loggers on many of the tortoises, checking on the status of the radio-tagged tortoises, and determining if the tortoises continue to demonstrate random movements or have settled into home ranges. They will also be looking at the impact of the tortoises on the vegetation with particular emphasis on the relation between the tortoises and cactus. Their results will help to highlight the role of tortoises in Galapagos ecosystems and inform future releases.

ESPAÑOLA In May–June 2010, Dr. James Gibbs of SUNY-ESF led a team of 22 park rangers to the island of Española for a survey of giant tortoises, waved albatross, *Opuntia* cactus, and woody vegetation. Their goal was to determine tortoise and albatross distributions throughout the central part of the island and provide insight into the past 1000 years of vegetation history on the island through carbon isotope analysis of soil samples. Looking at the history of the vegetation over this time period will provide insight into natural changes over time and those potentially caused by the presence of goats and the absence of tortoises for much of the twentieth century. Their results will help the Galapagos National Park better manage the island and its native wildlife. Results from the tortoise work will help fine-tune the breeding and rearing program for Española and will also inform further work on the island of Pinta, far to the north.



PROJECT MOCKINGBIRD

A SUBPROJECT OF PROJECT FLOREANA

Since the beginning of 2011, Charles Darwin Foundation scientists have been monitoring the progress of the Floreana Mockingbird (*Mimus trifasciatus*), an emblematic species listed as critically endangered by the International Union for Conservation of Nature. (IUCN)

The CDF Floreana Mockingbird Project coordinator, Luis Ortiz-Catedral, set up an ongoing monitoring program in collaboration with the Galapagos National Park Service (GNPS) and Durrell Wildlife Conservation Trust (DWCT) of Jersey, Channel Islands. The main purpose of the program is to determine the population status of this species and to identify what steps need to be taken to reduce its risk of extinction.

As part of the monitoring work, eighty individuals have been caught and banded. “The main advantage of banding individuals is that it gives us a way to accurately estimate population size on the Champion and Gardner-by-Floreana islets,” explained Ortiz-Catedral. Such tagging also helps to identify the composition of reproductive groups, the size of their territories, and, most importantly, their nesting sites, thus making it possible to evaluate reproductive success.

Terrain conditions are particularly difficult on Gardner, and the team of scientists carry out careful planning, strict quarantine procedures, and preventive measures to avoid altering the habitat of the remaining mockingbird populations.

On a recent field trip in April, the scientists detected 20 juveniles on both islets and observed the complete nesting cycle for 33 nests. The results of this study will enable detailed



© Luis Ortiz-Catedral

understanding of the species’ reproductive success, which varies from year to year because of the changing climate conditions in Galapagos.

Over the next few months, scientists will observe juvenile behavior to determine the establishment of territories and new breeding groups. They will also study the birds’ diet and habitat use.

The Floreana Mockingbird is a flagship species because of its important role in Charles Darwin’s thinking that led to the formulation of his theory of evolution. Extinct on Floreana for nearly 150 years, this species is found only on two satellite islets, Champion and Gardner-by-Floreana.

This work was made possible by the generosity of: Durrell Wildlife Conservation Trust, Galapagos Conservation Trust, Charles Darwin Foundation of Canada, Swiss Friends of Galapagos, Professor Richard Dawkins and Lalla Ward, Galapagos Conservancy, and National Geographic.

(Adapted from a Charles Darwin Foundation press release from April 2011)

Now through 2015, Galapagos Conservancy's three primary conservation focus areas are:

Knowledge Management ♦ Sustainable Society ♦ Ecosystem Restoration

We will introduce our members to each of these program areas in upcoming issues of Galapagos News.

UNLOCKING INFORMATION FOR SCIENCE AND CONSERVATION

INTEGRATING SCIENTIFIC DATA TO BETTER MANAGE NATURAL AND HUMAN ECOSYSTEMS IN GALAPAGOS

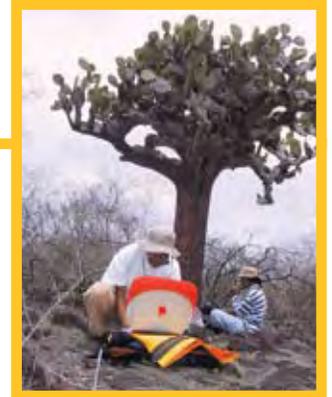
Since Darwin's visit to Galapagos in 1835, vast amounts of scientific information have been gathered about the islands. This information is vital for our understanding of the archipelago and to help guide the Government of Ecuador in its management of both the natural and human ecosystems of Galapagos. Over the past 50 years the Galapagos National Park Service (GNPS) and the Charles Darwin Foundation (CDF) have generated important research and monitoring data related to the management of the Galapagos ecosystem. Their work has been complemented by the research of hundreds of international scientists from dozens of organizations on a wide range of topics. Over the past 10 years, an increasing number of governmental and non-governmental agencies are both generating and using this information to promote conservation of the spectacular wildlife and landscapes of the archipelago and to ensure the well-being of its human inhabitants.

Although Galapagos is one of the most studied places in the world, access to basic information is surprisingly difficult. Moreover, despite the islands' fame and global importance, the management of information and knowledge is in disorder. As a first step to improve access to information, Galapagos Conservancy has begun working with an international group of institutions and individuals to outline a system that will standardize, integrate, and increase access to the information needed for effective conservation management in the islands.

CURRENT CHALLENGES AND OPPORTUNITIES

Scientists, government officials, policy makers, conservation managers, and others involved in Galapagos conservation face significant obstacles in accessing the information resources they need. These challenges include:

Lack of shared data protocols. There are few shared procedures for how data are recorded, archived, documented, and shared. Additionally, biophysical and socioeconomic data are not integrated in a way that easily supports planning and management by the governmental entities mandated to do so, particularly the Governing Council and the GNPS.

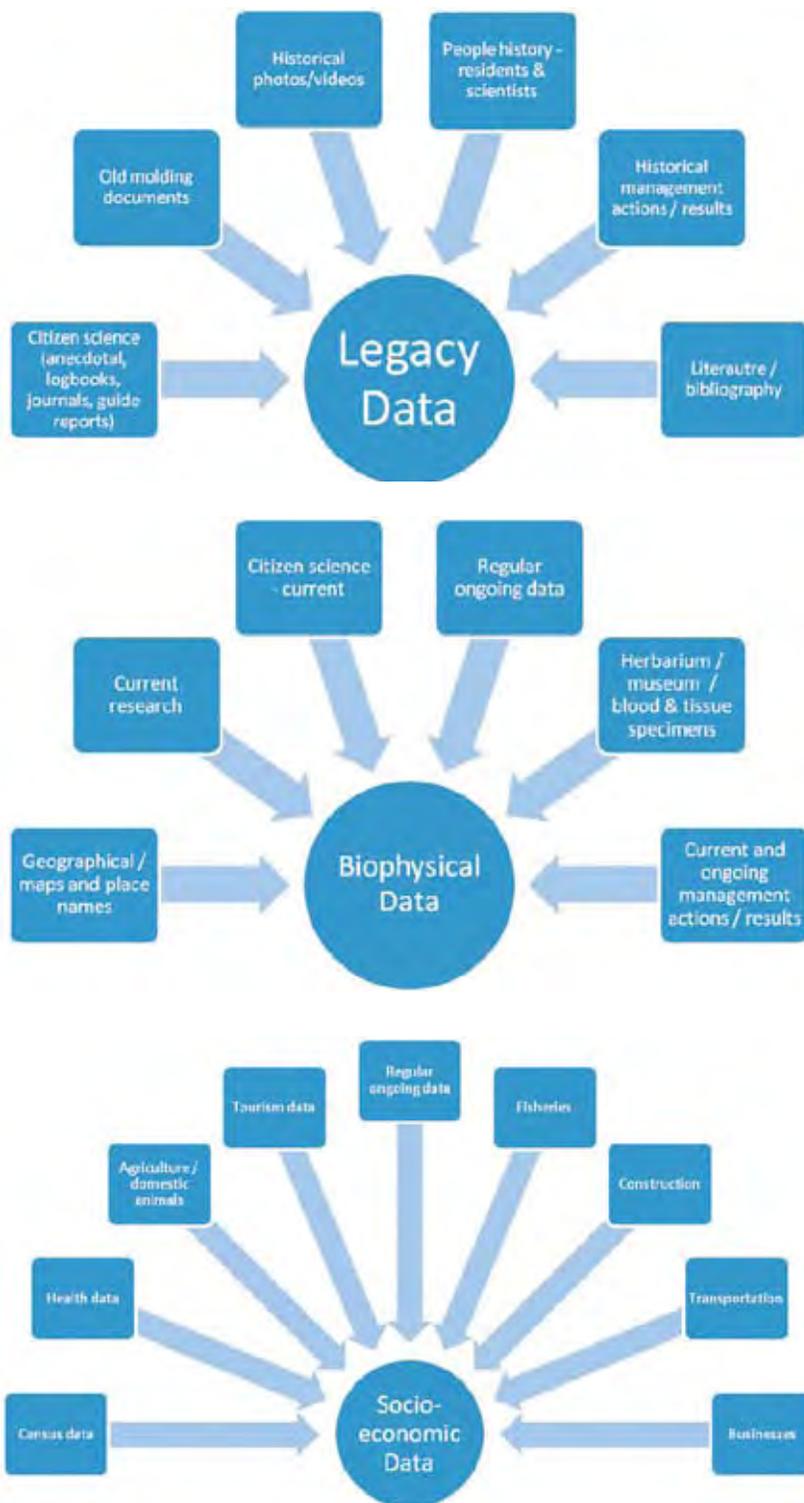


The three graphics on the following page show the numerous origins of relevant data, as they pertain to three broad categories of Galapagos information. GC seeks to simplify the accessibility of Galapagos data and information to improve conservation management.

Lack of standardized archiving and cataloging of existing information. Thousands of data sets, manuscripts, field notes, photographs, specimen samples, and student theses are held in museums and institutions worldwide and in the archives at the CDF and the GNPS. However, most of these resources are not inventoried, digitized, or available to the larger public. Because of this, scientists often duplicate studies or do not benefit from previous research.

Uneven capacity to manage and share spatial data. One of the challenges to managing information collected in Galapagos is that it is inherently site specific. There is a particular need to improve protocols related to spatial data. Yet the capacity among Galapagos institutions to capture and manage spatial data is highly variable, and there is no system in place to share such information across institutions.

Lack of mechanisms to benefit from citizen scientists/observers. More than 150,000 tourists pass through the islands each year, and this vast population of intent observers leaves without sharing observations that could contribute to our Galapagos knowledge. As significantly, no systems exist to capture observations and information from local residents. In many parts of the world, such "citizen science" opportunities have played an important role in data collection for science and policy-related decision-making. Moreover, at any given time, Galapagos likely has the highest density of qualified citizen scientists in the world. There is no way to capture their observations at present, much to the detriment of decision-makers in Galapagos.



THE SOLUTION

Our ultimate goal is to develop a unifying, accessible knowledge management infrastructure for Galapagos. This system will integrate diverse information resources, such as raw scientific data, observations on the distribution and abundance of native and migratory species, records from museum collections (both in Galapagos and around the world), records of marked plants and animals, demographic, economic, and social data about the Galapagos human community, and many other sources as well.

The development of an Information Management System for Galapagos will build on a number of important ongoing initiatives. Until now, these have been developed in isolation of each other, yet represent the seeds for an integrated, multi-institutional effort.

- INGALA, now part of the Governing Council of Galapagos, has developed a system called InfoGalapagos (www.infogalapagos.ec), which is a web-accessible compilation of databases, geographic information, maps, and documents.

- The Governing Council of Galapagos has created a system to manage the supply and demand of human resources in Galapagos.

- The CDF has developed the Galapagos Species Checklist, a peer-reviewed compendium of plant and animal species in Galapagos, and has begun to upload long-term weather data and introduced species data onto its Datazone application (www.darwinfoundation.org/datazone/checklists).

- In 1999, Galapagos Conservancy designed and implemented the Park's tourism database and trained staff; GC has successfully shared and operated this joint data gathering system since that time.

- The Galapagos National Park and the Governing Council of Galapagos have been working to develop an improved data management system that will integrate tourist data captured among several systems (tourism cards, INGALA entry cards, airline manifests).

- The Governing Council has also developed systems for matching employer needs and available human resources.

WANTED: *YOUR* GALAPAGOS PHOTOS

Galapagos Conservancy invites you to submit your favorite Galapagos photographs for our 2012 Galapagos Conservancy Calendar photo contest.

Please visit the Wildlife Gallery at www.galapagos.org to view last year's winners and for rules and guidelines on submitting your photos. GC members only.

Email no more than 5 digital photos, one per email, to photo@galapagos.org.



SUBMISSIONS DUE: Midnight on JULY 30, 2011

Background: Kicker Rock by Radim Schreiber. Inset photos: by GC members, Alan Kriegsfeld, Rick Beldegreen, and Catherine Dobbins d'Alessio

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