GALAPAGOS POST

MOVING CONSERVATION FORWARD

Southern Isabela Island's Giant Tortoises Galápagos Conservancy's New Tortoise Reserve Wings of Change: Helping the Waved Albatross Soar

GALÁPAGOS CONSERVANCY

FALL 2024

Moving Conservation Forward

from the **PRESIDENT**

Working for the conservation of the Galápagos Archipelago is a thrilling endeavor. It's also a race against time. Despite being one of the most protected ecosystems globally, the archipelago is facing impacts of climate change, marine pollution, and invasive species. But we're not daunted. With ever-growing interest in conservation in the archipelago, we see a window of opportunity to make significant strides in our mission in the years to come.

As the leading source of charitable support for Galápagos conservation and the primary US non-profit dedicated exclusively to building a sustainable future for the islands, we stand apart. We're proud of our achievements, but we're not resting on our laurels. We're committed to pushing boundaries, advancing, and innovating. This is conservation in action, with a team of dedicated conservationists, scientists, researchers, and education staff mostly hailing from Galápagos.

We have four decades of boots-on-the-ground experience in the archipelago and have developed a species rewilding program, focused on Galápagos giant tortoises, that is one of the planet's most successful for any species.

We face two paths as we look ahead to the next forty years of giant tortoise conservation. We can continue the steady and successful conservation work we have developed over the last few decades. Or, with your help, we can expand the impact of Iniciativa Galápagos our signature conservation program. We can harness the power of technology to unlock new methods of collecting data about tortoises. We can expand the footprint and efficiency of the tortoise breeding centers to accelerate the timeline for reaching sustainable tortoise populations. And we can focus our attention on tackling the emerging threats facing tortoises and seizing new opportunities.

We know what needs to be done to build a sustainable future for Galápagos and its tortoises. Time and resources are our only constraints. With your help, we can build that future. Together, we are Galápagos Conservancy.



Dr. James Gibbs President Galápagos Conservancy

5 An Eruption, Its Ecological Impacts, 4 and the Resilience of Life in Galápagos

12 Galápagos Conservancy's New Tortoise Reserve

14 Guardians of Southern Isabela Island's Tortoises

cont 20 Beyond Predictions: The Galápagos Archipelago After El Niño





r photo: A giant tortoise feeding in a Galápagos wetland op: Waved Albatross taking flight in the central colony on Española sland; Bottom: Tortoise release on Cerro Azul volcano on souther Isabela Island © Galápagos Conservan

INVEST IN CONSERVATION

Your contributions, large or small, fuel vital research, empower field conservationists, and safeguard iconic species. Help us conserve the archipelago's unique biodiversity and make a lasting impact on Galápagos.



UNDERWRITE AN EXPEDITION

of the archipelago.



FUND RANGER STATIONS

Help upgrade or build new ranger stations, ensuring park rangers have ecure shelters to base their critical work in remote areas.



Your adoption boosts the survival for each tortoise to nearly 100% and helps support research and protection efforts for all tortoises.



INVEST IN TECHNOLOGY

LEAVE A LEGACY

Include Galápagos Conservancy in your estate plans. Your gift will ensure perpetual support for the endangered species of Galápagos.

More Ways to Give

IRAs — Those over 70½ years of age can make tax-free contributions from IRAs to support our vital work.

Donor-Advised Funds — Use your preferred philanthropic vehicle to get an immediate tax benefit while continuing to help our critical mission.

Gifts of Various Types — Galápagos Conservancy welcomes gifts in various forms, including QCDs, stock donations, charitable trusts, savings bonds, and more.

Contact Us:

For questions, reach out to our philanthropy team at 703-383-0077 ext. 203, or visit our website for even more ways to get involved. You can also scan the QR code to donate today!

upport on-the-ground research expeditions that explore untouched parts

ADOPT A GIANT TORTOISE

Lo Innovative technology is essential for collecting vital data on the archipelago's biodiversity, allowing us to make more informed conservation decisions.

Scan to donate!



AN ERUPTION, ITS ECOLOGICAL IMPACTS, AND THE RESILIENCE OF LIFE IN GALAPAGOS



Yellow land iguana on Fernandina Island © Galápagos Conservancy

The recent eruption of La Cumbre volcano on Fernandina Island captivated the world with its fiery display. Beyond the aweinspiring spectacle lies a story of ecological disruption and the remarkable resilience of life on this young volcanic island.

While initial reports focused on the eruption's path and distance traveled, concerns soon arose about the impact on Fernandina's unique ecosystem. Experts from the Galápagos National Park Directorate confirmed damage to the island's vegetation, which raised concern for many land iguanas living in those areas. The lava-flows reaching the ocean also raised concerns about potential harm to marine life.

An important fact to remember is that volcanic eruptions are a natural part of the Galápagos story. The archipelago itself was formed by volcanic activity. As lava cools and hardens, it creates new land masses, eventually providing a base for new plant life to establish, paving the way for a return of fauna. While disruptive in the short term, this process is crucial for the long-term evolution of the islands' ecosystems. In fact, this latest eruption literally reshaped the map! Scientists estimate it added 1-2 hectares of new terrain — akin to creating a whole new football field (or two!) of brand new Galápagos real estate.



Sea lion colony at Cabo Douglas, northwest coast of Fernandina Island © Galápagos Conservancy

Looking beyond Fernandina, younger volcanic islands around the world demonstrate remarkable resilience in the wake of eruptions. Studies have shown that following an initial period of disruption, plant and animal life eventually returns. Species with high dispersal abilities, like those with wind-borne seeds and marine organisms, are the first to recolonize the new landscape. Lichens and mosses play an important role, starting the soil formation process that enables plants, and eventually animals, to colonize.

This inherent resilience offers hope for Fernandina's future. Although the immediate impacts of the eruption are concerning, the island's history and the natural world's remarkable ability to adapt suggest that Fernandina will successfully recover.

The eruption serves as a powerful reminder of the dynamic nature of the Galápagos Islands. As Dr. Jorge Carrión, Director of Conservation at Galápagos Conservancy emphasizes, "Our role is to monitor these natural occurrences while learning how the archipelago's irreplaceable wildlife is responding. By studying the delicate balance between volcanic activity and ecological resilience, we can make significant strides toward improved management."

CHARTING THE COURSE FORWARD FOR SOUTHERN ISABELA ISLAND'S **GIANT TORTOISES**

One of Galápagos Conservancy's most significant, recent achievements has been the completion of the first comprehensive and animal (a rebound of feral cattle and population census of giant tortoises living on southern Isabela Island. The census distinct populations, and encompassed two separate tortoise species.

This monumental undertaking was accomplished through Iniciativa Galápagos, our flagship conservation program. In close partnership with the Galápagos National Park Directorate, this program focuses on restoring populations of species, such as giant tortoises, critical to the archipelago's ecosystems.

The tortoise census involved a team of nearly 50 dedicated park rangers, scientists, and volunteers who embarked on a 100-day-long mission meticulously surveying all tortoise populations across southern Isabela Island. With ship and helicopter - support generously provided by the Galápagos National Park Directorate, that provide access to the many remote populations, the team encountered over 4,500 tortoises within the vast, 77-square-mile area surveyed. This comprehensive effort would not have been possible without the unwavering support of our donors.

The survey revealed a complex situation. While the population of Cerro Azul tortoises (Chelonoidis vicina) shows encouraging signs of recovery — a testament to ongoing conservation efforts — the outlook for Sierra Negra tortoises (Chelonoidis guntheri) remains bleak. Numbers of Sierra Negra tortoises have been stagnant for decades, highlighting the urgent need for targeted conservation strategies. The census further confirmed

feral pigs).

covered two volcanoes, documented ten Further action is needed. It is crucial to conduct a comprehensive genetic characterization of each tortoise species and population on southern Isabela Island to understand how they are related; this process is currently underway. We also need to implement robust invasive species control programs. Doing so will help ensure a successful reintroduction of tortoises from the Isabela breeding center into their habitat, promoting reproduction within each population.

> While giant tortoises were the primary focus during the census, we recognize the broader impact of our work. We strive not only to conserve these emblematic creatures but also to protect the unique ecosystems of Galápagos as a whole. Tortoises have played an important role as ecosystem engineers and we hope they can regain this role again someday on southern Isabela Island.

> Completing the first, comprehensive population census of giant tortoises in the southern Isabela Island was a daunting challenge. While this stage is behind us, even greater challenges lie ahead in helping these species back onto the road to recovery. We extend our heartfelt gratitude to all our donors who made these expeditions possible. Your support is not just a contribution, but a vital part of our mission.

Above: Population census of giant tortoises on the Sierra Negra volcano in southern Isabela Island; Below: Giant tortoise of the species Chelonoidis vicina from Cerro Azul Volcano © Galápagos Conservancy

the ongoing threat posed by invasive species, both plant (non-native guava)



SAFEGUARDING THE FUTURE OF GALÁPAGOS SEA LIONS: CONSERVATION AT THE CORE

Across the 'enchanted isles', Galápagos sea lions face threats from overfishing, climate change, and human activities, which have led to a notable decline in the sea lion population. In response, Galápagos Conservancy, in collaboration with the Universidad San Francisco de Quito and the Galápagos National Park Directorate, is at the forefront of efforts to safeguard these charismatic animals.

The Pinniped Research and Monitoring Expedition is a cornerstone of this effort. This expedition, undertaken annually, allows us to monitor trends, health, and the effects of environmental changes on the archipelago's sea lion population. The information gathered provides data to inform effective conservation strategies.

Recognizing the importance of community involvement in conservation success, we also actively engage the local community in educational activities about sea lions. Doing so highlights the sea lions' ecological roles as well as their contribution to the archipelago's biodiversity. By enhancing community understanding and appreciation, we foster a collaborative approach to conservation, ensuring that these efforts are supported locally.



Conserving Galápagos sea lions goes beyond protecting a species; it also helps maintain the marine environment and the many captivating species within it. With ongoing challenges faced by Galápagos' sea lions, support from our global community is more crucial than ever. Together, we can secure a thriving future for the pinnipeds of Galápagos.

EXPLORING THE SECRETS OF GALÁPAGOS' INTRIGUING NOCTURNAL INHABITANTS

The Galápagos Archipelago, known for its unique and captivating biodiversity, still holds many mysteries, especially when it comes to its nocturnal inhabitants. Two species that pique our curiosity are its two native bats – the red bat (*Lasiurus blossevillii brachyotis*) and the gray bat (Aeorestes villosissimus).

We know very little about these creatures. A critical question is whether populations of these species on different islands are genetically distinct enough to warrant protection for each. This unanswered question has spurred a project to unravel the hidden



mysteries of Galápagos bats. Funded by Galápagos Conservancy, this project is a collaborative effort between the Galápagos National Park Directorate, the Technical University of Loja, and the University of Idaho.

The research team conducted field studies across Santa Cruz, San Cristóbal, Isabela, and Floreana islands, recording nocturnal sounds that document bat activity. To gain a deeper understanding of Galápagos bats, researchers are also collecting biological samples for genetic analysis.

Data collected throughout different seasons and habitats has revealed several intriguing findings. Researchers found that gray bats inhabit all surveyed islands, while red bats are exclusive to Santa Cruz. After three years, the researchers observed that bats exhibit annual activity patterns influenced by the seasonal availability of insects, their primary food source. Beyond sound recordings, the team attached transmitters to bats to gain insights into their habitats and resting sites. Surprisingly, bats were found in various habitats, including areas overtaken by introduced vegetation.

We are also supporting the establishment of a long-term monitoring program that will employ cutting-edge techniques to further unveil the secrets of these species and provide data useful for guiding their conservation.

A STRATEGY FOR CONSERVING THE GALÁPAGOS PETREL

The Galápagos Petrel, a Critically Endangered seabird endemic to the Galápagos Archipelago mostly nests in the highlands of San Cristóbal, Floreana, Santa Cruz, Santiago, and Isabela islands, is threatened by invasive plant species and predators that disrupt its nesting sites and kill nestlings and adults. Notably, invasive plants like guava and quinine displace native vegetation crucial for nesting, while rats, cats, and pigs prey on the birds. Livestock farming further endanger the nesting sites, as cattle and horses trample nests.

To combat these threats, Galápagos Conservancy, with the support of the National Fish and Wildlife Foundation, now has conservation efforts in place across several islands, with projects on Santa Cruz, Santiago, and Isabela focusing on restoring Petrel habitats, controlling invasive species, and monitoring nests. Additional efforts on other islands aim to support petrel populations through coordinated conservation strategies. These initiatives, led by Galápagos Conservancy and supported by the Galápagos National Park Directorate, are crucial for the survival of this species. Community and international cooperation play pivotal roles in these conservation measures, emphasizing

THE GALÁPAGOS PENGUINS AND THEIR STRUGGLE FOR SURVIVAL

The Galápagos Penguin (Spheniscus mendiculus), defying expectations as the only penguin species found north of the equator, lives in a warm climate – a stark contrast to the icy environments we normally associate with these flightless birds. The rarest and most endangered penguin on Earth, the Galápagos Penguin faces numerous challenges in its unique habitat. resulted in the Galápagos Penguin being listed as Endangered by the International Union for Conservation of Nature (IUCN). Invasive species also threaten the Galápagos Penguins. Rats prey upon eggs and chicks and have become a serious threat to population recruitment. The Galápagos National Park Directorate carries out periodic controls of these invasive species.

The Galápagos Penguin's equatorial home presents challenges that other penguin species don't face. The region is highly susceptible to El Niño, a natural climate phenomenon marked by warmer-than-



news bulletins from GALÁPAGOS



habitat restoration, species monitoring, and research to inform management actions necessary for the Petrel's recovery. These comprehensive efforts underscore a commitment to conserving this unique species and ensuring a future where the Galápagos Petrel can thrive.

average sea surface temperatures. These warmer waters disrupt the food chain, leaving the penguins struggling to find enough prey. During past El Niño events in 1982-1983 and 1997-1998, the population declined by a staggering 60%. This vulnerability has resulted in the Galápagos Penguin being listed as Endangered by the International Union for Conservation of Nature (IUCN).

Another factor impacting this penguin's population is a shortage of suitable nesting sites. Their traditional nesting sites – small caves or crevices in lava – are disappearing. Marine iguanas have claimed some, while others are subject to tidal flooding. However, a glimmer of hope emerged in 2010 when Dr. Dee Boersma of the University of Washington and her team, with support from Galápagos Conservancy, built 120 high-quality nest sites. These penguin "condos" made from plates of lava stacked together to form a robust shelter led to the first population increase in years.

With fewer than 1,200 Galápagos Penguins remaining, their future is at risk. Galápagos Conservancy prioritizes research and support for this irreplaceable species. Recognizing the penguin's plight, the Galápagos National Park Directorate recently established a special protected area around Mariela Island, a crucial breeding area for this species. The creation and protection of nesting sites, and our ongoing research efforts have provided a lifeline for the Galápagos Penguin. Your contributions are vital for finding solutions to protect these special penguins.

GALÁPAGOS CONSERVANCY GRANTS BOOST **CONSERVATION ACROSS THE ARCHIPELAGO**

The staff of Galápagos Conservancy works tirelessly to conserve, protect, and restore the archipelago's vital ecosystems. Our numerous partners, both within the archipelago and beyond, enhance efforts to rewild endangered species, restore land and marine habitats, and cultivate the next generation of conservation educators and leaders in the archipelago.

Aside from our signature programs like Iniciativa Galápagos and our decade-long species-recovery partnership with the Galápagos National Park Directorate, Galápagos Conservancy also provides grants to many partners to tackle conservation priorities for the archipelago. In the most recent funding cycle in 2023, 31 projects received support. These projects addressed diverse challenges, ranging from large-scale initiatives like invasive species control to smaller, but equally important, efforts like studying coral resilience and monitoring marine iguana health on Santa Cruz Island during the recent El Niño event.

The popular Women in Sustainable Entrepreneurship (WISE) program also continues, funding a diverse range of conservationrelated projects undertaken by enterprising women throughout Galápagos. Since 2021, we have provided support for 68 WISE projects. These projects, led by visionary women, determined



entrepreneurs, and local institutions, represent our ongoing commitment to a sustainability approach that integrates economic development and environmental conservation, with the well-being of the local population.

INNOVATING TO PROTECT GALÁPAGOS CORALS

Coral reefs play a vital role in the health of our oceans. They are teeming ecosystems, providing food and shelter for many marine species. Reefs also act as natural barriers, protecting coastlines from erosion and supporting sustainable tourism - a major source of income for the region. Galápagos is no exception - coral reefs fringe many of its islands. Unfortunately, natural phenomena like



EMPOWERING COMMUNITIES: A WOMAN-LED INITIATIVE FOR SUSTAINABLE AGRICULTURE

Conservation in Galápagos isn't just a talking point - it's woven into the very fabric of life for its residents. Notably, the women of Galápagos are leading the charge, spearheading innovative initiatives that pave the way for a sustainable future.



A major challenge to sustainability is the archipelago's isolation, which makes it heavily reliant on agricultural imports from mainland Ecuador, creating a constant vulnerability to invasive species being brought in that could disrupt the native species and ecosystems of Galápagos.

In response to these challenges, Galápagos Conservancy is supporting women like Emilia Bravo, who has taken the lead in creating a more sustainable agricultural future for the islands. Emilia's initiative centers on an innovative hydroponics project, involving the cultivation of vegetables using minimal water and eliminating the need for soil. This ensures a steady supply of local, fresh food.

Beyond food production, the project fosters a culture of sustainability through community demonstrations and training that encourages the adoption of sustainable agricultural practices. Additionally, the initiative strengthens local food security by donating seedlings for fast-growing crops, promoting the creation of urban gardens.

This project is leaving a lasting legacy of empowerment in sustainable agricultural techniques, laying the groundwork for a brighter and more hopeful future in Galápagos. Women like Emilia Bravo stand as role models, inspiring us all to take actions, no matter how small, to protect our planet.

ENSURING THE FUTURE OF GALÁPAGOS SHARKS

At least six shark species that live in the Galápagos Marine Reserve are listed as Vulnerable, Endangered, or Critically Endangered by the International Union for Conservation of Nature (IUCN). This is concerning, as sharks play a crucial role in both the marine



news bulletins from GALÁPAGOS

El Niño events (1982-83, 1997-98) in Galápagos have devastated these delicate organisms, causing more than 97% of shallowwater corals to die. These events stand as a stark reminder of the vulnerability of Galápagos corals to climate change.

Recognizing the urgent need for conservation, Galápagos Conservancy has expanded its scope of work and action to coral recovery efforts in the Galápagos Marine Reserve, collaborating with the Galápagos National Park Directorate on several projects to boost protection for corals.

Since 2022, collaborative efforts have enabled the acauisition of specialized equipment and the development of advanced methodologies to propagate several coral species. In collaboration with local and international experts, innovative coral cultivation and transplantation techniques have been established in nurseries on Santa Cruz, the archipelago's central island.

These innovative approaches and collaborations have fostered better conditions for coral recovery in several areas, catalyzing an expansion of coral reef recovery efforts built on the technologies developed and the lessons learned. This success story highlights how well-planned and executed human interventions can have positive outcomes for the conservation of our coral reefs and the marine life they support in Galápagos.

ecosystem and the local economy as a significant tourist attraction. Galápagos Conservancy is currently supporting research led by biologist Eduardo Espinoza of the Galápagos National Park Directorate to understand the threats facing the sharks of Galápagos, which include habitat loss, indiscriminate fishing for the global shark fin trade, and changes in the ocean environment due to climate change. One of the most endangered shark species in the Galápagos Marine Reserve is the scalloped hammerhead, which has undergone a population decline of 80% over the last 75 years. This staggering trend underscores the need to act quickly to avoid the extinction of this awe-inspiring species.

Very little was known about the scalloped hammerhead until recently when new research begun by Eduardo Espinoza provided the first-ever discovery of a scalloped hammerhead nursery in November of 2017. The research team has since discovered two more hammerhead nurseries in the Galápagos Marine Reserve.

Eduardo Espinoza calls this latest finding of a new nursery, made just last year, a milestone for conservation. "The discovery of this new hammerhead shark breeding area excites us and gives us renewed hope for the species' conservation."

These exciting discoveries are only the beginning of a research conservation partnership that will support all sharks in the Galápagos Marine Reserve.



THE GALÁPAGOS CONSERVANCY CONSERVATION CENTER REINVENTS ITSELF!



The Galápagos Conservancy Conservation Center, which Galápagos Conservancy recognizes that successful opened its doors on June 6, 2022, has become a vibrant hub for environmental education in Puerto Ayora on Santa Cruz Island. Dedicated to showcasing our organization's work protecting biodiversity and promoting sustainability in ongoing progress and conservation wins. Stay tuned for Galápagos, the center has welcomed over 15,000 visitors from around the world, mostly from the US and Ecuador, as well as many local community members and students.

The center's engaging exhibits on geology, history, and the restoration of the iconic giant tortoises of Galápagos leave a lasting impression on most visitors. The inquisitive questions of children and students reinforce the center's vital role in nurturing the next generation of Galápagos stewards.

A unique attraction—a massive 3D map of the entire archipelago featuring wooden figures of tortoises custommade by a local artisan—has become a favorite among visitors.

But the journey continues! To better serve the community and amplify our message, the Conservation Center is relocating to a new, more prominent location. This move will allow us to elevate visitor engagement with conservation and sustainability messages tailored to resonate with diverse visitors.

conservation requires a multifaceted approach. We are excited to unveil a more interactive and engaging experience in our new conservation center that reflects our updates by the end of the year! In the meantime, please visit our website and subscribe to our newsletter for the latest news.

Above: Tourists pleased with their visit to the Galápagos Conservancy's Conservation Center; Below: University students learn about giant tortoises at the Conservation Center © Galápagos Conservancy





GALÁPAGOS MARINE LIFE APP SOON TO BE RELEASED

We are thrilled to announce the upcoming release of the marine reptiles, and marine mammals. Nearly 1,000 Galápagos Marine Life app, a tribute to Dr. Cleveland species are featured. The launch of the app will be Hickman, a renowned marine biologist and steadfast announced on Galápagos Conservancy's website as well supporter of Galápagos Conservancy. Dr. Hickman, as through email communications. The app is for iOS the author of several field guides on Galápagos marine devices (iPhones and iPads) only for now, with an Android invertebrates, has made an enormous contribution to version planned in the future. our knowledge of the archipelago's marine biology and conservation. In his honor, Dr. Hickman's family and By offering this free and publicly accessible app, we colleagues have joined forces to make his invaluable work accessible to the public in app form for mobile devices, Galápagos' extraordinary marine life among residents, ensuring his legacy endures. visitors, and researchers. Join us in celebrating Dr.

The Galápagos Marine Life app captures a vast trove of information generated by Dr. Hickman and his colleagues since the 1980s about the marine invertebrates of Galápagos. The app now also includes marine fishes,



Starfish on the sandy bottom of the Galápagos Marine Reserve © Daniel Fitter

aim to enhance the knowledge and appreciation of the Hickman's legacy and support Galápagos Conservancy's conservation efforts by downloading and exploring the Galápagos Marine Life app. Stay tuned for its release and be among the first to dive into the wonders of the Galápagos marine ecosystem.

Seahorse coexisting with a pencil urchin on the Galápagos seabed © Daniel Fitter



GALÁPAGOS CONSERVANCY'S NEW TORTOISE RESERVE: THE FUTURE SANCTUARY FOR SOUTHERN ISABELA ISLAND'S GIANT TORTOISES

Galápagos represents a treasure trove of biodiversity, with the iconic giant tortoises playing a crucial role in maintaining its terrestrial ecosystems. Since the archipelago's discovery, however, humans have drastically decreased tortoise populations around the archipelago by around 90%, with some species currently facing extinction.

The endemic tortoise of Sierra Negra volcano on Isabela Island, Chelonoidis guntheri, is a prime example. This species once boasted an estimated population of 70,000 individuals and a historical distribution area of over 300 square miles but has suffered greatly. Large-scale hunting during the pirate, whaling, and colonization eras, combined with the devastating impact of invasive species such as feral pigs, drove these declines. By the 1970s, only about 300-500 individuals remained, representing a decline of over 99%.

The conservation status of the Sierra Negra tortoise remains concerning. With just around 700 individuals remaining in the wild and invasive species posing a continuous threat, we don't have much time to develop population restoration strategies for Sierra Negra's giant tortoises.

Through careful analysis of the situation, we identified the need to establish a habitat reserve for giant tortoises on Isabela Island. Galápagos Conservancy has secured a critical tortoise habitat encompassing over 120 acres. This land is at a strategic 1,000 feet above sea level and acts as a buffer between the agricultural zone and the Galápagos National Park area.



Dr. Jorge Carrión, conservation director of the Galápagos Conservancy, during a population census of tortoises on southern Isabela Island © Galápagos Conservancy

The creation of the tortoise reserve marks a decisive step towards protecting and restoring giant tortoises and their habitat on Isabela Island. We will soon begin actively eradicating invasive species within the reserve area and building the required infrastructure to provide a well-protected home for many tortoises.

We are working collaboratively with the Galápagos National Park Directorate to develop the reserve, which goes beyond just protecting giant tortoises. The reserve will also help restore several other unique species on the flanks of Sierra Negra volcano.

By supporting the reserve, you become part of the solution. Imagine a thriving Isabela Island where the gentle giants once again roam freely.



Giant tortoise of the species Chelonoidis guntheri inhabiting Sierra Negra volcano, Isabela Island © Galápagos Conservancy



A Sierra Negra Volcano giant tortoise © Galápagos Conservancy



Members of the Giant Tortoise Guardians on Isabela Island, combine local knowledae and scientific data to protect and restore giant tortoise populations. © Galápagos Conservancy

Advancing Conservation Efforts

Recognizing the gravity of the situation, Isabela Tapia Jaramillo, a young conservationist from the Galápagos Islands, is taking action. In 2022, as part of her master's degree research thesis, Isabela spearheaded a project brought to life with the support of a small grant from Galápagos Conservancy. This initiative fosters collaboration with the local Isabela Island community to restore the Sierra Negra tortoise.

Together, they crafted a groundbreaking tool that integrates invaluable local knowledge alongside technical and ecological data. This innovation allows conservation managers to pinpoint the ideal locations for releasing captive-bred tortoises, a crucial step in the recovery of southern Isabela Island's giant tortoise populations.

The project, however, unveiled a harsh reality: ongoing poaching is much greater than generally known. It also highlighted a gap in environmental awareness and conservation commitment among some in the community. Bridging the gap between the local community, science, and management will be paramount to achieving tortoise recovery on southern Isabela Island. Given these circumstances, there has never been a more relevant and critical time to address the poaching of giant tortoises in Galápagos.

Building on this success, a new, community-based monitoring program, aptly named Giant Tortoise Guardians, was

GUARDIANS OF SOUTHERN ISABELA ISLAND'S TORTOISES

Isabela Island stands as a stark reminder of the need to rethink conservation strategies. A century of habitat loss, tortoise harvest, and invasive species have taken their toll. Today, one of the island's five tortoise species – the Sierra Negra volcano tortoise (C. guntheri), once the most populous in Galápagos, teeters on the edge of extinction. Poaching of giant tortoises, in particular, remains a vexing and persistent threat in the southern Isabela Island, putting the Critically Endangered Chelonoidis guntheri in danger of being lost forever. Local wisdom echoes scientific data, painting a chilling picture of the pending extinction of a Galápagos giant tortoise species. This situation demands immediate and decisive action.

established. After launching this summer the program will train 20 Isabela Island residents to become stewards of their local tortoise population. These guardians will focus their efforts on areas near human settlements and potential poaching hotspots.

"WE CAN REWRITE THE NARRATIVE AND MOVE CONSERVATION FORWARD ENSURING THESE GENTLE AND KEYSTONE GIANTS CONTINUE TO ROAM THE ISLAND FOR GENERATIONS TO COME.' - ISABELA TAPIA

Isabela Tapia aims to produce adaptive, inclusive, and sustainable solutions for the long-term conservation of the Sierra Negra giant tortoise population. The program will not only enhance our understanding of the poaching crisis, but also pinpoint high-risk areas, support targeted conservation efforts, and foster deeper community engagement. Perhaps the most important outcome lies in empowering the Isabela Island community. "When people of all ages, genders, abilities, ethnic backgrounds, and economic sectors feel invested and included in the conservation of their environment, remarkable and transformative things can happen," she explains. "The future of Isabela's giant tortoises may be uncertain, but with a united community, we can rewrite the narrative and move conservation forward, ensuring these gentle and keystone giants continue to roam the island for generations to come."



SCALESIA TREE IN GALÁPAGOS

A critical fight is underway to save the Critically Endangered make towards its restoration contributes significantly to the Scalesia cordata tree on Isabela Island. This endemic tree, overall health of the ecosystem. with its heart-shaped leaves, symbolizes the natural beauty of Galápagos. Sadly, this unique species faces a multitude of Galápagos Conservancy is dedicated to the conservation and threats in the only place it occurs – between the imposing Sierra recovery of the majestic Scalesia cordata. We have provided Negra and Cerro Azul volcanoes on southern Isabela Island. major support to rebuild greenhouses that will grow young heart-leafed scalesia. This project is being carried out on the A century ago, vast Scalesia cordata forests blanketed southern ground by residents of Isabela Island, especially local youth Isabela Island, stretching over 42,000 acres. Unfortunately, who participate replanting heart-leafed scalesia forests, which human activity, wildfires, and invasive species have decimated fosters community engagement. With continued restoration these forests. Today, only a tiny fraction (0.1%) of the onceefforts, these resurrected forests will, in time, become a powerful thriving forest remains, and even this remnant is under siege by symbol of our ability to conserve and defend the irreplaceable invasive guava trees and other invasive plant species, pushing S. biodiversity of Galápagos.

cordata, towards extinction.

Understanding the urgency of the situation, Galápagos Conservancy has partnered with the Galápagos National Park Directorate. Together, we have launched a five-year project titled, "Protection and Restoration of Scalesia cordata", with the goal of expanding upon the efforts to protect this species initiated by the Charles Darwin Foundation. This project has yielded promising results in its first two years.

Researchers observed a significant increase (28.7%) in the number of living trees. They also discovered five new S. cordata populations with at least 300 trees. Currently, 146 seedlings are being nurtured in the Galápagos National Park Directorate's nursery for transplantation into their natural distribution area.

Galápagos Conservancy's Conservation Director Dr. Jorge Carrión emphasizes that, "Each tree we cultivate contributes to the future of Galápagos." Scalesia cordata symbolizes our responsibility to this unique archipelago, and every effort we



OUR EXPERTS AT THE GIANT Tortoise breeding centers

The story of the comeback of Galápagos giant tortoises is an example of applying scientific insight to innovate conservation. Captive breeding and rearing programs for giant tortoises, started in 1965, have proven critical to the recovery of many tortoise populations. These programs raise young tortoises in a safe environment during their first five years, when they are most vulnerable to predators and subject to water and food scarcity. The giant tortoises' return from the brink of extinction would not be possible without the dedicated individuals who work tirelessly behind the scenes. Galápagos National Park Directorate to help run breeding centers.

Our experts make a significant difference, and Field Assistant Walter Chimborazo is one of them. Walter is a familiar and friendly face at the Fausto Llerena Breeding Center on Santa Cruz

Island, where he works alongside park rangers to ensure the safety and well-being of thousands of young giant tortoises.

Walter's days are a testament to his dedication: every Monday, Wednesday, and Friday he prepares and distributes fresh greens to the hungry tortoises. On other days, he cleans the tortoises' corrals and ensures they get enough sunlight to maintain healthy body temperatures and growth. During the nesting season, Walter works seven days a week to monitor eggs in incubators and adjust temperatures to ensure optimal development. Walter is godfather to thousands of these little gentle giants. The most rewarding aspect for him is witnessing the steady growth of each one firsthand.

IT'S THE Power of Working Together That Makes It all Possible

Below: Walter Chimborazo (right), Field Assistant at Galápagos Conservancy, with park ranger Efren Pombosa during tortoise monitoring in Cerro Azul © Galápagos Conservancy





Cristian Gil taking morphometric measurements of a juvenile tortoise on Isabela © Galápagos Conservancy

The story of Technical Assistant, Cristian Gil, another include optimized enclosures, breeding pens, of our tortoise experts, is also an inspiring one. He and new tortoise egg incubation systems. These grew up on the flanks of Sierra Negra volcano on improvements enhance the tortoises' lives while allowing staff to provide more effective and less Isabela Island, surrounded by the archipelago's incredible biodiversity, and witnessed firsthand disruptive care, demonstrating their renewed the plight of the volcano's giant tortoises, whose commitment to the tortoises' well-being. population has collapsed from being its largest to now its smallest. This passion for conserving his The human touch behind our thriving breeding homeland inspired Cristian to pursue a degree in centers, exemplified by Walter's dedication to Santa Cruz and Cristian's commitment to Isabela, is made environmental science and eventually join our team possible by this successful collaboration with the at Galápagos Conservancy.

Cristian's dedication is evident at the Arnaldo Tupiza Breeding Center on Isabela Island. Established in 1995, the center serves as an important sanctuary for the island's threatened tortoises. Recent upgrades to the center, funded by Galápagos Conservancy,



Walter Chimborazo collecting giant tortoise data © Galápagos Conservancy

The human touch behind our thriving breeding centers, exemplified by Walter's dedication to Santa Cruz and Cristian's commitment to Isabela, is made possible by this successful collaboration with the Galápagos National Park Directorate. Through continued collaboration, dedication, and innovation on the ground, we can ensure that this success story continues. It's the power of working together that makes it all possible.

WINGS OF CHANGE: Helping the waved Albatross soar

Every year, the remote Española Island in the Galápagos archipelago transforms into a vibrant stage for one of nature's most elegant rituals—the mating season of the Waved Albatross. Known for their impressive wingspan and unique courtship behaviors, these magnificent seabirds return annually to nest on this island, their sole nesting site on the planet. They engage in a meticulously choreographed mating dance, which reinforces relationships between individual birds that often pair for life.

The reproductive cycle is a delicate process beginning with selecting a nesting site, followed by egg-laying, and months of joint parental care. Both parents take turns incubating their single egg and, later, feeding the chick with regurgitated oily food consisting of fish, squid, and crustaceans that they gather at sea. After months of growth and nurturing, the young albatross take their maiden flights — an initiation into their next phase of life on the open ocean. After spending several years at sea, they return as adults to Española Island themselves to breed. Living up to 60 years, Waved Albatross will repeat this nesting cycle many times throughout their lives.

Waved Albatross face threats from climateinduced changes like stronger and more frequent El Niño events, which diminish oceanic food availability, affecting their reproduction. Longline fishing gear, which uses baited hooks that may attract albatross, poses fatal risks to adult birds through accidental capture.

Recent comprehensive surveys conducted by Galápagos Conservancy staff and park rangers have provided essential data on

population trends, highlighting a decline in nesting during the recent El Niño year. A survey in 2021 estimated the nesting population at around 35,000 individuals. These insights drive our targeted actions.

One of the biggest threats is that the nesting grounds of the Waved Albatross are slowly being overtaken by trees and shrubs. In April 2024, with the support of the National Fish and Wildlife Foundation (NFWF), our Galápagos Conservancy team traveled to Española Island and cleared almost 50 new landing strips for the birds in areas where trees and shrubs had overcome their nesting habitat. This habitat management helps ensure there are clear landing and takeoff zones crucial for these long-winged soarers.

An important strategy in our conservation efforts has been the reintroduction of giant tortoises to Española Island. Acting as natural landscapers, these ecosystem engineers also help maintain open areas free of encroaching vegetation, facilitating safer albatross landings and take-offs. This beneficial relationship between species underscores the interconnectedness of conservation actions and the importance of holistic ecosystem management.

As we observe these magnificent birds embark on their mating rituals, the importance of conservation becomes clear. Each step we take, in collaboration with local and international partners, contributes to a future of the Waved Albatross that is as enduring as their timeless mating dance.

EACH STEP WE TAKE CREATES A FUTURE FOR THE WAVED ALBATROSS THAT IS AS ENDURING AS THEIR TIMELESS MATING DANCE







Above: Waved Albatross colony in the central part of Española Island during mating and nesting season; Bottom left: Galápagos Conservancy staff and park rangers work on cleaning up the landing and take-off runways used by the albatrosses; Bottom right: Encounter between two albatrosses during their courtship in the breeding season © Galápagos Conservancy

BEYOND PREDICTIONS THE GALÁPAGOS ARCHIPELAGO **AFTER EL NIÑO**



In early 2023, a powerful El Niño event was predicted to bring unusually high oceanic temperatures and substantial rainfall to the Galápagos Archipelago. Although sea temperatures increased, the downpours anticipated never materialized, leaving scientists to reevaluate an unexpected outcome and its implications for the future.

The unique biodiversity of Galápagos thrives under a delicate climate dynamic, and disruptions like El Niño's periodic warming of Pacific Ocean sea surface temperatures can have

GALÁPAGOS POST | FALL 2024

a significant ripple effect. These disruptions impact both marine and terrestrial ecosystems, altering resource availability and triggering cascading effects throughout the food chain. El Niño events can also cause erosion and even act as dispersal agents for invasive species, a major threat to Galápagos.

Despite failing to materialize, the recent El Niño in Galápagos offers a valuable learning opportunity. We can gain crucial insights for future climate predictions and conservation efforts by examining how the event deviated from expectations.

El Niño's Impact

In 2023, the scientific community warned of a powerful El Niño event. Early warning signs, such as rising sea surface temperatures and shifting atmospheric patterns, all pointed toward a significant climate disruption. Historically, such conditions trigger increased precipitation in Galápagos. However, this El Niño event defied expectations. While sea temperatures around Galápagos were notably high, reaching levels characteristic of strong El Niño events, the anticipated heavy rainfall did not occur. The archipelago received only sporadic showers, with below-average precipitation.

Fortunately, this deviation from the expected pattern significantly reduced the potential biological impacts. Past El Niño events, with similar sea surface temperatures, like those in 1982-1983 and 1997-1998, had devastating consequences. Increased water temperatures caused the loss of approximately 97% of coral reefs, leading to a domino effect that affected marine species, as many rely on coral reefs for shelter and food. Food scarcity triggered significant population declines in penguins, cormorants, sea lions, and marine iguanas, among other species. The effects extended beyond the marine environment, impacting both the islands' wildlife and human inhabitants.

The most prominent impact of the 2023-2024 El Niño event in Galápagos was the substantial rise in sea and air temperatures. These elevated temperatures directly impacted marine life, particularly species sensitive to temperature fluctuations. For instance, the warming waters led to a decrease in nutrient-rich upwellings, a critical food source for fish populations. This, in turn, led to consequences up the food chain, affecting predators that rely on them, such as seabirds, marine reptiles, and mammals. This explains the observations of malnourished marine iguanas in many colonies and the near absence of Waved Albatross reproduction on Española Island. Fortunately, unlike previous El Niño events with similar high temperatures, there were no significant increased mortality rates recorded.

The 2023-2024 El Niño event serves as a reminder of the inherent variability and complexity of climatic phenomena. While predictive models have advanced significantly, accurately forecasting the precise outcomes of such events remains challenging. This is especially relevant considering the undeniable effects of climate change and the departure from the Holocene's remarkable climatic stability over the past 10,000 years. Human activity has fundamentally altered the Earth's climate, ushering in a new era — the Anthropocene.

Moreover, the unusual nature of this El Niño underscores the importance of preparedness and adaptive management in Galápagos. As climate patterns become increasingly

unpredictable, conservation efforts must incorporate flexible strategies to mitigate adverse effects. This includes investing in resilient agricultural practices and safeguarding vulnerable ecosystems through targeted conservation actions.

The 2023-2024 El Niño event serves as a valuable case study for understanding climate science in the Galápagos Archipelago, highlighting the critical need for us to get involved and support ongoing research and adaptive management efforts. With your continued investment, we can bolster the resilience of the unique biodiversity within Galápagos, ensuring its survival for generations to come.



BACK TO SANTIAGO ISLAND: WHERE THE REMOVAL OF FERAL GOATS, PIGS, AND DONKEYS **MAKES WAY FOR NEW CONSERVATION CHALLENGES**





Aerial view of the giant tortoise nesting area called "Cumpleaños" on Santiago Island © Galápagos Conservancy; Bottom left: Lava cactus (Brachycereus nesioticus), a species endemic to the Galápagos Islands © Pete Oxford; Bottom right: An adult Chelonoidis darwini tortoise taking advantage of the shade provided by a guava tree, an demic species of Galápagos © Galápagos Conse

At the heart of Galápagos lies Santiago Island, one of the largest and most fascinating islands in the archipelago. Santiago showcases a canvas of contrasts, from vast arid expanses in the lowlands to extensive barren lava flows and lush, humid vegetation housing many species of flora and fauna. The island's moist zone is dominated by "rodilla de caballo" or "horse knee" in English (Volkameria mollis), a native shrub that weaves intricate thickets difficult to traverse. Navigating this terrain without a machete and a group of skilled people adept in its use would be impossible, unless you are a giant tortoise, pushing your way through these dense stands of "horse knee" with extraordinary strength and persistence.

Dr. Washington Tapia, our General Director, has dedicated decades to the conservation of Galápagos. For him, Santiago Island is not just a geographical wonder but a treasure trove of memories intertwined with the island's history and a struggle by many to conserve the island's unusual ecosystems and species.

Washington first experienced Santiago Island during his adolescence while volunteering to study sea turtles nesting at Espumilla Beach on the island's west side. Years later, as a park ranger, he returned to the island to eradicate invasive species, including goats, pigs, and donkeys. Since their eradication, Santiago's vegetation, particularly its shrubs and trees, has vigorously rebounded. This monumental effort, completed more than a decade ago, transformed the island's landscape, ushering in a new era for Santiago.

THIS WORK WILL **OPEN DOORS AND ENHANCE PROTECTION OF THE FRAGILE ECOSYSTEMS AND UNUSUAL SPECIES OF SANTIAGO** ISLAND.

Unholstering his machete, Washington recently embarked on a challenging expedition back to Santiago. This return focused on clearing a path to access the highlands that had been forgotten since the 1990s and had become overwhelmed by the rebounding vegetation. The ascent involved a journey made complicated by crossing terrain formed by flows of lava, characterized by its irregular, rough, and rocky surface.

resilience. Trekking 15 miles daily under the scorching sun in challenging terrain was strenuous. But encounters with Galápagos hawks, snakes, lava lizards, giant tortoises, flycatchers, mockingbirds, carpenter bees, Opuntia cactus forests, and other unique Galápagos plants and animals added special meaning to the experience. Washington found the journey intense and fascinating. He particularly noticed the presence of Opuntia cacti, most of which were young, ranging from 10 to 12 years old. This observation aligns with the time that has passed since feral donkey eradication, suggesting that thanks to this action, the cactus population is growing vigorously again.

According to Washington, the expedition was not just about opening the path to access an almost forgotten giant tortoise nesting area known as "Zone D." It also involved an indepth assessment of the reproductive activity of Santiago giant tortoises (Chelonoidis darwini) in the area. The goal was to collaborate with the Galápagos National Park Directorate to plan future work aimed at accelerating the repopulation of Santiago with thousands of new young giant tortoises.

Over the centuries, this species has faced the pressure of being harvested to feed whalers and sailors, as well as the devastating impacts of feral donkeys and goats destroying their habitat, and pigs depredating their nests. As a result of these impacts, Santiago's giant tortoise population faces an unusual predicament - it consists of a highly reduced population dominated

by older males. Washington's visit confirmed this reality, with the most troubling finding being that the few females still present were all auite old.

To fix this imbalance, concrete research and management actions are urgently needed. Inspired by successful efforts to restore other tortoise species in Galápagos, Washington emphasizes that such achievements offer a spark of hope that can illuminate the path forward for giant tortoise recovery The expedition was a test of the team's on Santiago Island. Plans are currently underway to meticulously locate nests, collect eggs, and transfer them to the captive breeding center, where many of the eggs will be incubated at female-producing temperatures.

> Future expeditions will also benefit from the development of a network of access paths, and most crucially, a strategically placed tank to store water collected from the garúa — the mist that regularly rolls across the volcanic terrain. This innovation will eliminate the need to transport water from Santa Cruz, freeing up space for food and other essential gear.

> Washington's return to Santiago marked a significant milestone with the opening of the new trail to the "Zone D" nesting area and his deep dive into giant tortoise biology. This represents the beginning of a new and exciting phase of conservation of Santiago Island. This work by Washington and his team at Galápagos Conservancy will open doors to more in-depth research and enhanced protection of the fragile ecosystems and unusual species of Santiago Island.



Our members are the driving force behind our efforts to conserve, protect, and restore the Galápagos Islands. As we work with our partners to tackle some of the biggest challenges Galápagos has ever faced, **we need your support now more than ever**.

AMPLIFY YOUR IMPACT AS A GALÁPAGOS GUARDIAN

Your generous online recurring monthly gift is the most efficient and reliable source of funding that we can count on for expeditions, scientific research, saving endangered species, and so many other direct conservation actions! Online gifts have the lowest overhead cost, so they are the most cost-effective way for Galápagos Conservancy to receive your support.

Plus, Galápagos Guardian recurring monthly donors receive this exclusive iron-on 2024 fur seal patch!





Scan the QR code or visit galapagos.org/fall2024 to become a Galápagos Guardian monthly donor today.

> GALÁPAGOS CONSERVANCY 1630 Connecticut Ave. NW, Suite 300 Washington, D.C. 20009 Tel: 703,383,0077

Galápagos Post is a biannual publication that is produced for Galápagos Conservancy's supporters and friends.

GOING GREEN: Help us help the environment by requesting to receive this newsletter by email instead of by mail. It's simple: email member@galapagos.org with "Galápagos Post by email" in the subject line, and include your full name and address in the body of the email.

