



GALAPAGOS SPRING/SUMMER 2008 *news*

a biannual English-language publication for members of the international network of Friends of Galapagos organizations

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President's Report

POLITICAL WILL AND LOCAL INITIATIVES: DETERMINING THE FUTURE OF GALAPAGOS

This issue of *Galapagos News* seeks to address the range of issues facing Galapagos today. Last year at about this time, Galapagos was placed on the World Heritage Sites in Danger list, signaling the international community's acute concern that Galapagos was in grave danger of losing its unique biological identity. Even before this announcement, Ecuador's President Correa issued Executive Decree 270 which cited Galapagos conservation as a national priority. In this decree, he tasked local institutions in Galapagos to create concrete measures to address educational reform, tourism redesign, migration patterns and illegal immigration, and a plan for the control of invasive species.

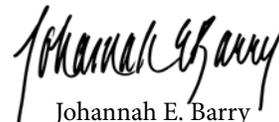
Where are we a year later? The Plan for Total Control of Invasive Species has been approved and a trust fund established by the government and a host of non-governmental institutions (see p. 7). The Regulation for Control and Qualification of Residency has been approved, and the Galapagos National Institute and the new Governor of Galapagos, Eliecer Cruz, have initiated a program to significantly strengthen migratory controls. Finally, local organizations are developing a new tourism model that will function as the basis for new tourism concessions in Galapagos.

This is not to suggest that all the problems in Galapagos have been solved or even adequately addressed. President Correa's decree set in motion a significant wave of effort and the conservation community is committed to keep that momentum moving forward.

The articles in this issue reflect directions in which conservation management programs are moving, and some innovative directions in land management undertaken by new NGO actors on the ground in Galapagos. The production of coffee as a high-value, low impact alternative in the agricultural markets (p. 3) represents some new thinking about island-based industries. A thoughtful essay on the future of tourism by Sven Lindblad complements Dr. Graham Watkins' analysis on Galapagos at an economic and biodiversity crossroads. While the core of the CDF's work continues to focus on the conservation of Galapagos biodiversity, both the CDF and the Galapagos National Park are asking hard questions about the social and economic streams which now affect the conservation questions.

Galapagos Conservancy continues to advocate for sound public policy in Galapagos. We continue to support both direct biological research and socio-economic investigations. Galapagos is no longer an isolated archipelago and lasting conservation will only be achieved when we understand the forces which shape the present and future direction of Galapagos.

This issue also welcomes Henry Nicholls as the new editor of *Galapagos News*. Readers will remember his lively account of Lonesome George in the book *Lonesome George: The Life and Loves of a Conservation Icon*. Dr. Nicholls is a science journalist specializing in evolutionary biology, the environment, conservation and history of science.



Johannah E. Barry
President

COFFEE IN GALAPAGOS: A NEW BOOST FOR AGRICULTURE IN THE ISLANDS

A number of supporters have asked about the small but growing coffee industry being developed in Galapagos. Many wonder if this is a truly sustainable industry, what the implications might be for the deliberate production of an introduced plant species, and whether this industry represents the kind of conservation-minded investments that Dr. Graham Watkins talks about in his thoughtful essay (p. 4).

Coffee is thought to provide an important opportunity for local farmers. It is a high-value, low-volume product that can generate significant income. Additionally:

- It is a non-aggressive species that can serve as a barrier for protected areas against highly aggressive plant and insect species.
- Most coffee species grow much better in the presence of shade. Coffee production meshes well with ecological, conservation, restoration and reforestation initiatives, especially those involving scalesia.
- During the production cycle, coffee's water requirement is considerably less than many other crops. Even when considering the water that is often used in post-harvest processing, coffee's "water footprint" is less than that of many lucrative alternatives.
- The by-product from the pulping and fermentation process can be used for composting in organic agriculture.

Currently most coffee grown in Galapagos is dried in the islands (sun dried) and sent to the mainland for roasting and packaging. A small portion of the coffee produced in Galapagos is roasted and packaged in the islands using artisanal techniques, and is later sold locally.

Local producers are in the process of forming a cooperative that will help to process and market locally-grown coffee,

but they must still address several key issues as they consider expanding organic coffee production in Galapagos:

- It will be important to identify and adopt the best practices available in terms of minimizing the use of water and energy in the post-harvest process.
- Most of the value of coffee is added during the process of roasting and packaging. If Galapagos producers are to benefit, they will need to establish sophisticated and reliable transportation and marketing channels.
- Harvesting coffee requires intensive labor. This represents an opportunity for local human resources, but if not managed carefully it could result in pressure to bring laborers in from the mainland.
- It will be important to make sure that increased coffee production is

carried out in an environmentally sound manner (organic, shade, certification, etc.).

Luckily, the market pays a premium for organically-grown coffee, and major pests in coffee production are not present in Galapagos. It is expected that these incentives will encourage producers to use appropriate techniques and to support quarantine and inspection measures to avoid the introduction of coffee pests to Galapagos.

One local organization exploring the sustainability of this kind of agriculture is the locally-based conservation group FUNDAR (www.fundargalapagos.org). FUNDAR has received funding from a Global Environment Facility (GEF) initiative designed to reduce the impact of invasive species in Galapagos. GEF funding will also finance pilot projects involving new kinds of production and added value activities.

Galapagos Islands Survey

As Galapagos Conservancy members are aware, we approach new visitors to the Islands with an 8-point survey designed to capture their reactions to and impressions of their visit and find out a bit more about their conservation concerns. We tabulate these responses and periodically report to our membership about trends in visitor interests and priorities. These data inform the projects we support and the issues we bring to the CDF and Galapagos National Park as being of high interest and concern to our international membership.

According to the survey, visitors continue to come to Galapagos predominately to view the unique terrestrial flora and fauna but there is a growing interest in marine issues and marine visitation. Along with this interest is increased alarm about fishing in the Marine Reserve and Ecuador's commitment to protecting and preserving the islands. Visitors rate these issues as being of "extreme concern" to them. Closely following is a concern that is repeatedly noted in both the survey and additional comments about the number of visitors to the islands and the long term impact of this rising visitation rate.

Finally, we are pleased to note that many visitors ask to stay informed about Galapagos issues and are willing to support Galapagos conservation efforts.

AT A CROSSROADS

By Graham Watkins

Galapagos is an extraordinary and unique place. This is thanks, in no small part, to events that unfolded some 50 years ago. In 1957, two young scientists – Irenaeus Eibl-Eibesfeldt and Robert Bowman – visited these islands under the auspices of UNESCO and IUCN to assess the ecological wealth and health of the archipelago. Their mission began a long journey that led, in time, to the formation of the Charles Darwin Foundation (CDF) and the Galapagos National Park Service (GNPS) in 1959 and their Galapagos-based headquarters in 1964 and 1968, respectively. These two institutions have played a major role in earning these islands the title of best-preserved tropical archipelago on earth. But if future generations are to experience this relatively pristine gem, another change in thinking is needed and urgently.

There has been immense progress made in understanding the unique biology of these islands. Perhaps most importantly, the CDF has helped train more than 1,000 student biologists and resource managers. Española Island, which was overrun with goats in the 1950s, is now free from these introduced and devastating mammals, as are eight other islands, including Isabela, the largest land mass in the world to be cleared of goats. Populations of giant tortoise and land iguana are steadily returning to pre-human levels. The Galapagos National Park and Marine Reserve make up a World Heritage Site that offers a lesson to the world in how to manage natural resources.

Today, however, we face a very different set of challenges. Galapagos conservation is no longer solely about solving biological problems. Increasingly it is about easing the immense stresses that humans have posed on the archipelago. External markets and globalization have taken their toll: fishing has grown rapidly from the 1990s onwards and tourism has doubled

in the last decade. The various institutions in the islands – the CDF and GNPS included – have not kept pace with this extraordinary growth as people, drawn by opportunities, have continued to arrive. The increasing population and focus on serving external markets increase the

potential for conflict and political patronage complicating institutional life.

The consequences of this ongoing growth include a greater risk of oil spills, overharvesting of marine species and

an ever-increasing number of invasive species.

In 2007, the local, national and international community made an unprecedented acknowledgement of the threats posed by this rapid, recent development. The President of Ecuador has tasked local and national

institutions to find solutions and clarified leadership in a complicated institutional environment. The task ahead is enormous. It includes implementing education reform to continue the training of local residents and strengthen local institutions to be better able to deliver results, finding investment for the development of new and sustainable businesses and all the while ensuring that conservation of the islands remains a fundamental priority.

So Galapagos is at a crossroads once more. As in 1957, the writing is on the wall for the future of the islands unless immediate remedial action can be taken. We think that by working together locally, nationally and internationally we can address these problems and create a sustainable society in the islands. I hope fervently that you will join with us in this complex task of ensuring the future conservation of this extraordinary place.

Graham Watkins is the executive director of the Charles Darwin Foundation.

“The writing is on the wall for the future of the islands unless immediate remedial action can be taken.”

GALAPAGOS NEWS

Wind power

In February, Ecuador's President Rafael Correa toured a new wind-energy park on San Cristobal. It's estimated that the three new 800-kilowatt wind turbines will slash diesel fuel imports to the archipelago by half, reducing the shipping traffic between the mainland and the risk of oil spills in this sensitive environment.

This is part of a grand plan that could one day see the islands' 30,000-strong human population using renewable energy from a combination of wind, solar and biofuel projects to meet all their needs.

End to iron seeding

Controversial plans to “seed” the waters around the Galapagos Marine Reserve with iron dust have been shelved. Conservationists uncomfortable with the experimental nature of the proposals have expressed relief.

According to Planktos, an “eco-restoration” firm based in California, the iron would help slow down global warming by acting as a fertilizer, stimulating the production of phytoplankton in the ocean and hence the removal of CO2 from the atmosphere.

Now, following months of strong opposition, Planktos has announced that it failed to find sufficient funding for its efforts and would postpone its project indefinitely.

GLOBAL GALAPAGOS

By Bernd von Droste

Writing on Galapagos is part of a personal journey that began 35 years ago, a journey in search of a true understanding of the global ecological crisis and how it can be solved.

Working for UNESCO has led me to travel repeatedly to some of the world's most outstanding natural and cultural sites and to be concerned with their state of conservation. Amongst them is the emblematic Galapagos archipelago, a showcase of evolution and a hotspot of biodiversity. On this journey, I have been able to observe the growing threats that civilization has placed on our planet and our changing relationship with the global environment.

When Galapagos became a World Heritage property in 1978, a nomination I processed as the UNESCO officer responsible for natural heritage, the archipelago was very different from today. Then the islands were barely inhabited and tourism a relatively small industry. In its evaluation of the Galapagos nomination, the first ever made for World Heritage, the World Conservation Union (IUCN) stated that the ecological balance of the Islands was threatened, mainly through the invasion by alien species.

The notes I have made on repeated visits to Galapagos are informed by numerous excellent papers by staff of the Charles Darwin Research Station and insights from discussions with experienced staff of the Galapagos National Park Service. These jottings provide a clear indication of the dramatic changes that have taken place since the 1970s. I only need to look at the increase of human population on the Islands: 1,000 in 1978, 15,000 in 1996, 30,000 in 2007. There has also been a steep increase in tourism: 9,000 in 1978, 50,000 in 1996 and 150,000 in 2007.

Directly correlated with the human population growth and tourism expansion is the increasing traffic between the archipelago and the mainland and between the islands themselves, leading to a breakdown of the isolation on which natural evolutionary processes are so dependent. There were close to 2,500 aircraft landings on the

islands last year alone.

My notes also reveal that the number of species alien to Galapagos has increased more or less proportionally with the number of resident and visiting humans. There were about 200 alien vascular plants on the islands in 1978, 400 in 1996 and 800 in 2007.

In 2006, UNESCO and IUCN experts warned the World Heritage Committee of an ever-increasing loss of biodiversity and unsustainable exploitation in the archipelago. Their report ended with the following statement:

“Galapagos is shifting into an economic development model that is fundamentally at odds with long-term conservation and sustainable development interests. Galapagos is becoming an attractive destination for an increasing number of economic migrants, further driving population growth. This growth is actively encouraged by government subsidized fuel, electricity and transportation of people and goods from the continent.”

Energetic actions to curb illegal immigration, contain tourism, stop illegal fishing and prevent the flood of introduced species are long overdue. For many years, calls from UNESCO and IUCN have gone unheeded. Finally, in early 2007, the joint mission could report a substantial change in government policy towards Galapagos.

The Presidential Decree of April 2007 declared the Galapagos “in danger” and a national priority for immediate action. For the first time in Ecuador's history, this put matters of the environment at the top of the government's policy agenda, at the same level as defense and security. After many years of rapid degradation of the integrity of the terrestrial ecosystem and surrounding sea, the government of Ecuador has shown determination.

Looking at the number and size of the problems to be solved, it is quite obvious that they can only be tackled in a collaborative effort by the Ecuadorian government and the international community. There is now a need for massive international assistance, notably to make the quarantine system work,



© Lori Ulrich

Increased air traffic is reducing the isolation of the archipelago.

to facilitate the repatriation of illegal immigrants, to eradicate alien species, to stop illegal fishing and to limit the arrival of more aircraft and ships. The authority and functioning of the Galapagos National Park Service must be strengthened further still.

Since human occupation of the archipelago is recent, the quest for cultural identity is very important for the construction of social coherence. In the case of Galapagos, the educational system should enable local people to assume their evolutionary responsibility for the continuation of a unique fabric of life.

However, there is another aspect of human life on the islands. During my last journey I noted with great concern that about 15% of the human population of the Galapagos live below the poverty line. Therefore the solution of social, environmental and economic problems should figure high on the agenda of the government and international donors.

A further loss of the famous endemic flora and fauna of the Galapagos Islands would not only be a loss in the world's biodiversity but also an irreparable loss to the whole of humankind. The first steps to reverse a disastrous trend have now been taken. I hope that the travel log of my next journey to Galapagos will show the tide has turned.

Bernd von Droste joined UNESCO in 1973, was director of the division of ecological sciences from 1983 to 1991 and the founding director of the World Heritage Center, which he established in 1992 and directed until 1999. Since then, he has continued to implement the World Heritage Convention through his work as an advisor to UNESCO and IUCN.



NEWS FROM GALAPAGOS

PROVIDED BY THE CHARLES DARWIN FOUNDATION

Pinta to get tortoises

A group of pioneering tortoises are about to make history. Later this year, wardens from the Galapagos National Park Service (GNPS) will ship dozens of baby Española tortoises from pens at the Charles Darwin Research Station (CDRS) and release them on Pinta. This is the first time in the history of Galapagos

“There is an urgent need to manage the ecosystem properly,” says Milstead. “It’s a tortoise-dominated, tortoise-evolved landscape. Pinta needs a dominant herbivore now.” It will be tortoises of Española origin - Lonesome George’s closest living relatives - that fulfill this pioneering role.

Around 50 Española babies, between 5 and 10 years old, will be transferred every



© Alison Chopra/Galapagos Conservation Trust

conservation that conservationists have attempted to replace one species with another, says Bryan Milstead, head of vertebrate research at the CDRS.

The reason for this bold move is simple. Pinta’s tortoises are all but extinct. The only known individual – the hapless Lonesome George – has been in captivity at the CDRS since his discovery on the island in 1972. Without its tortoises, Pinta’s vegetation is suffering. Some species are starting to crowd out others, says Ole Hamann, a botanist at the University of Copenhagen in Denmark who has been studying Pinta’s plants since the early 1970s.

year from the successful Española captive breeding program at the CDRS to Pinta. They will be fitted with radio transmitters, allowing scientists to study how they colonize the island and the impact they have on the island’s vegetation.

New governor

As of August last year, Galapagos has a new governor. Eliecer Cruz was born and raised on Floreana, and is the former director of both the World Wildlife Fund’s Galapagos program and the GNPS. Since taking office, Cruz has been working on

new immigration measures aimed to get tough on some 5,000 illegal immigrants currently in the archipelago. He has also spoken of plans to raise the tourist entry fee to the Galapagos National Park, which currently stands at \$100.

As governor, Cruz also presides over the Galapagos National Institute (INGALA), the planning and decision-making authority in the archipelago. At a council meeting in August, the first in which a president of Ecuador has been present, INGALA took several important steps towards solving many of the problems in Galapagos, including approving the Plan for Total Control of Introduced Species – a set of strategies to manage invasive species – and the resolution that all planes arriving in Galapagos must first pass through the Galapagos quarantine systems in Quito or Guayaquil. In addition, the president signed the Special Regulation for Residence in Galapagos – a critical document for immigration control.

Fire on Santiago

Park wardens working on eradicating invasive blackberry on Santiago Island noticed a large fire close to the coast back in September. By cutting a fire break and with the help of additional wardens sent up from Santa Cruz, they were able to put out the blaze, but not before it had seriously damaged almost 600 square feet of White Mangrove *Laguncularia racemosa*, a native tree on the IUCN Red List of endangered species. The fire appears to have been started by fishermen who were illegally camped there.



© CDRS

Governor Eliecer Cruz (left) and President Rafael Correa respond to questions at a recent press conference.

Training for tour operators

In September, more than 50 small and medium-sized companies from the tourism sector in Galapagos participated in workshops on sustainable tourism. The main goal of these workshops was to train the private sector in the development and adoption of good practices, promoting sustainable activities. Using real-life examples, the participants learned about identifying immediate measures that contribute to saving operating costs, such as efficient use of water and energy, environmentally friendly methods of water purification and measures to avoid the spread of alien species.



© CDRS

Invasive Species Trust Fund

In December 2007, the Ecuadorian government set up a Trust Fund to help finance the control of invasive species in Galapagos. Currently the fund has received contributions from the Ecuadorian government, Conservation International, the United Nations Foundation, Galapagos Conservancy, and the Swiss Friends of Galapagos. Additional matching funds will be provided by the Global Environment Facility.

This initiative has a target of US\$15m and will be administered by the Ecuadorian National Environment Fund. At the same time, INGALA and the GNPS prepared a report to the World Heritage Commission outlining how Ecuador intends to address the problems that led to Galapagos being listed as a World Heritage site “in danger”.

Sea lion massacre

Wardens from the Galapagos National Park making a routine patrol made a gruesome discovery in January: the mass slaughter of dozens of sea lions on Pinta. They found the remains of 53 animals, 13 of them pups, and almost all with fractured skulls. This rules out death by natural causes. The GNPS has filed a report with the Galapagos Judicial Authorities and requested a full investigation to establish criminal responsibility for the deaths.

Hammerheads see red

The scalloped hammerhead shark is to be placed on the World Conservation Union’s Red List of threatened species later this year. It will be classified as “globally endangered”, one notch below the highest rating of “critically endangered”. The taste for sharks’ fin soup and other shark-based dishes, particularly in Asian cuisine, has meant that illegal fishing of Galapagos’ sharks, including the scalloped hammerhead, continues in Galapagos, in spite of GNPS’ efforts to curb this activity.

Eavesdropping iguanas

Marine iguanas may not be known for their quick wits, but they are smart enough to listen to mockingbirds, using the birds’ calls to alert them to approaching danger. This is thought to be the first known instance of a creature that makes no vocal sounds “eavesdropping” on the cries of another species, report researchers from the Universities of Princeton in the US and Bath in the UK in the journal *Biology Letters*.

Refresher for guides

GNPS is now offering an intensive refresher course for the archipelago’s naturalist guides. Those renewing their licenses must now take this course, bringing them up to date with the latest scientific research, local and national laws and regulations related to preserving the biodiversity of the Galapagos Islands. It also enables GNPS to maintain close contact with the guides.



© Alex Hearn/CDF



Tortoises of unknown identity at the CDRS.

© CDF

CSI TORTOISE

By Adalgisa Caccone and Jeffrey Powell

As aficionados of television programs like *Crime Scene Investigation* or *Law and Order* will know, almost every individual is genetically unique. This doesn't just go for humans, it goes for most microbes, fungi, plants and animals on the planet. The giant tortoises of Galapagos are no exception and for more than 15 years, we've been studying the genetic makeup of these extraordinary creatures, a line of work that has revealed some surprising insights into the wonderful and mysterious world that is Galapagos.

Our journey began in 1991 with a visit to the Charles Darwin Research Station on Santa Cruz. There were plenty of live tortoises on show, many of them from endangered populations. There were also



© Lucindo Gonzales.

The Chaco tortoise from mainland South America is dwarfed by its giant cousins in Galapagos.

dozens of tortoises handed over from folks keeping them as pets or confiscated from those trying to smuggle tortoises off the islands. With no reliable records documenting their island of origin, these tortoises were destined to live out their days in captivity. But we soon realized that

maybe our expertise with DNA might help.

We began by asking a basic question: where did the Galapagos tortoises come from? Genes soon gave us the answer. Their closest living relative is the much smaller Chaco tortoise from central South America. All tortoises alive today are descended from an ancestral lineage that reached the oldest existing islands shortly after their formation around 5 million years ago. We went on to map how the descendants of those first tortoises spread out to colonize the rest of the archipelago. To our delight, the genetic evidence indicates that, as predicted, tortoises must have traveled in the direction of the main currents, from the older islands in the southeast to the younger ones in the northwest.

How can genetics reveal all this? Think *CSI*. No two tortoises have quite the same genetic sequence. Based on the reasonable assumption that the longer two populations have been living apart, the more DNA differences will have accumulated between them, we can work out roughly when tortoises reached each island and from where. By taking a small blood sample from thousands of tortoises, we have also found that each isolated population has its own particular genetic signature. This has enabled us to work out the island of origin for the variety of Galapagos tortoises that

had been brought to the Research Station back in 1991 and determine the origins of some 200 Galapagos tortoises housed in zoos around the world. One of our hopes, so far not realized, was that we might turn up a suitable mate for Lonesome George, the only known Pinta tortoise left on earth.

We can even detect telltale DNA differences between two isolated populations that inhabit different parts of the same volcano. On Santa Cruz, we discovered that the two main tortoise populations – at La Caseta/Santa Rosa (the place thousands of tourist visit each year) and at Cerro Fatal to the east – are as genetically distinct from each other as they are from any other tortoise species in the archipelago. The DNA held this secret close and it fell to us – the geneticists – to detect it.

We have also been involved with analyzing one of the most successful captive breeding programs anywhere in the world. By the 1960s, the tortoise



© CDF

Wolf volcano on Isabela might harbor a mate for Lonesome George.

population on the island of Española had been decimated, largely owing to competition with feral goats. The last 15 animals – 12 females and 3 males – were

“Studying the genetic makeup of tortoises has revealed some surprising insights into the wonderful and mysterious world that is Galapagos.”

taken into captivity in the hope that they would breed. More than 2,000 Española babies have now been released back to Española, which is now free from goats thanks to the heroic work of Galapagos National Park Service (GNPS) rangers. The Española species is

reproducing again in the wild. While this program has been immensely successful, our DNA analysis of Española offspring revealed that some of the captive adults



are contributing much more to the next generation than others. This is of some concern, since the short-term survival of this species can be attained with limited genetic variation, but its long-term viability will depend on maximizing genetic variation to ward off disease and other threats. We have made specific recommendations on how more of the genetic variation of the breeders can be restored to the now “natural” population.

The genetic makeup of the Española species has also revealed another useful insight. These tortoises are Lonesome George’s closest living relatives. Based on this information, the GNPS is planning to introduce Española tortoises onto Pinta to help restore its ecological balance. These animals will carry satellite transponders so they can be tracked as they spread out across the island.

This is not as fanciful as it sounds. Last year, we identified an intriguing hybrid on the northernmost volcano on Isabela. The DNA from this male tortoise shows that his mother came from Wolf volcano and his father from Pinta, suggesting that Lonesome George may not be the last Pinta tortoise after all. We are planning an expedition to sample the Wolf volcano tortoises more thoroughly in the hope that we can locate some females with Pinta-like genes. This is one of the most inaccessible and inhospitable places in Galapagos so it will not be easy or cheap. But the new molecular laboratory at the GNPS, which is enabling Ecuadorian scientists to join us on this fascinating CSI journey, will make our work far easier than it has ever been before.

Adalgisa Caccone (above) and Jeffrey Powell are the principal investigators of Galapagos tortoise project in the Department of Ecology and Evolutionary Biology at Yale University.

A FORCE FOR POSITIVE CHANGE

By *Sven-Olof Lindblad*

During the last 15 years, Galapagos has experienced significant economic, social, cultural and ecological changes. The principle driver of these changes has been tourism, which it’s estimated has risen from about 40,000 visitors in 1990 to nearly 150,000 last year.

In April 2007, President Rafael Correa stated that the islands were in imminent danger. He even raised the possibility of restricting tourism. In June, following on the heels of the president’s announcement, UNESCO placed the islands on its list “World Heritage in Danger.” If changes aren’t made to protect the unique character of the islands, many fear that UNESCO may drop Galapagos from its prestigious World Heritage list.

The bad news is that Galapagos is sorely out of balance on many fronts. The good news is that it’s a relatively contained environment and people are beginning to more openly discuss the challenges and, in the process, develop more empathy for each other as stakeholders.

Tourism in particular is being scrutinized, as it should be. It is also being demonized, which is not at all productive. As in most industries there is good and bad. There is enlightened behavior and ignorant behavior. There is long-term and short-term thinking. There is investment and there is greed.

There is no sense in eliminating tourism, nor is that ever going to happen. Too many people depend on it. So the question is – what kind of tourism should prevail? What defines a positive tourism enterprise that works hand-in-hand with the community, its people, its social and environmental needs?

I’ve been involved with Galapagos for a very long time. My father, Lars Eric Lindblad, brought organized tourism to Galapagos in 1967. But even then, when the challenges were a fraction of what they are now, he anticipated that tourism,

without careful regulation, could be damaging. So he worked with scientists and the Galapagos National Park to set up practices and regulations, many of which are still in force today.

I believe we have continued with an ethic that he set forth over 40 years ago. You cannot develop a business at the expense of the environment or the community. You must develop a partnership between the aspirations of the visitor, the community and your business, as they all depend upon

each other if sustainable tourism is to be possible.

As an industry, tourism does not have an exemplary record when it comes to focus on sustainability. This is in part due to the fragmented nature of the industry, but

also because there are limited forums where stakeholders can develop more meaningful dialogue and understanding regarding issues of collective concern.

Further regulation will, if well crafted, help. In addition, “change agents” like ourselves will have an invaluable role. Our experience globally and our heritage of positive social and environmental behavior is, I believe, an asset for Galapagos. We have demonstrated a willingness, indeed a desire, to participate in restorative activity. We believe firmly we are more part of the solution than part of the problem.

Yes, Galapagos has many challenges. But they are by no means insurmountable. They need focused leadership, which results in a focused vision, which is then implemented and communicated in a focused manner. The stakeholders both within Galapagos, in Ecuador and around the world need to be brought together to work towards a sustainable Galapagos - a Galapagos that recognizes a healthy environment is essential for human prosperity and responsible tourism is a pillar to that prosperity.

Sven-Olof Lindblad is the founder and president of Lindblad Expeditions.

“You cannot develop a business at the expense of the environment or the community.”

THE MAGIC OF ISOLATION

By Edward J. Larson

In wildness is the preservation of the world,” wrote the American philosopher, poet and environmentalist Henry David Thoreau. For the Galapagos, however, the preservation of wildness is all about isolation.



A plantation in the highlands of San Cristobal, photographed in 1888.

The reasoning is simple. In a Darwinian world, only the fittest survive. On a continental landmass where many species develop and large populations compete, the Darwinian process efficiently shapes ever-fitter types. In an isolated place like the Galapagos, it operates differently. The few species that arrived adapted to niches not open to them elsewhere. Those first finches, mockingbirds, iguana and tortoises found safe refuge on the Galapagos. They evolved into their endemic forms and flourished in their splendid isolation.

As a group of remote oceanic islands unpopulated by prehistoric people, isolation lasted longer for the Galapagos than for nearly any other place on earth outside the Polar Regions. Even the first few human visitors – lost Spaniards in the 1500s and hideaway buccaneers in the 1600s – scarcely broke the spell. It was the 1798 official report of Captain James Colnett that brought the first major changes.

Whales provided the fuel oil of choice for Europeans by the 1790s, and Colnett was sent by the British admiralty to find new whaling grounds to replace the ones being depleted in the North Atlantic. His published report depicted the region

around the Galapagos as the central breeding site for Pacific sperm whales and the islands as a source of food for sailors. About the giant tortoises, he wrote, we consider them “the most delicious food we ever tasted. All apprehensions of scurvy or any other disease were at an end.”

For the next half century, before petroleum replaced whale oil as a fuel source, the Galapagos became a favorite stop for whalers, sealers and merchant ships engaged in trade with China. Whales and fur seals were hunted to the brink of extinction; tens of thousands of tortoises were taken for food; settlements appeared to serve the sailors; and goats, pigs, cattle, fruit trees and crops were introduced. On the more intensely settled islands of San Cristobal and Floreana, isolation was lost and many endemic species disappeared forever. Feral livestock and introduced plants did most of the damage by out-competing native types.

A second siege on island isolation took place early in the twentieth century, as museums, universities and zoos sought to expand their collections. Thanks to Charles Darwin’s work there, few places held greater interest for evolutionary biologists than the Galapagos. Fearing that many island animals were already on the brink of extinction, they attempted to collect all the remaining tortoises and many other endangered species in the hope of preserving them as specimens.

Expeditions mounted by the British Museum, California Academy of Sciences, American Museum of Natural History and other scientific organizations scoured the islands

in the years before World War II, reaching remote areas beyond the range of earlier whalers and settlers. Only the interior of Isabela Island survived this assault relatively intact, but even its isolation was impacted. The 1906 CAS expedition netted over 75,000 specimens, including 264 tortoises, some of them the last of their kind.

World War II brought desolation to Baltra Island, which the United States Army flattened for an airbase. Hundreds of bored soldiers and sailors had a

temporary impact, of course, but it was the airstrip itself that ultimately shattered the islands’ splendid isolation.

Before the Baltra airport, tourists had to sail to the Galapagos by ship, which limited their number. By the

1970s, commercial air traffic to the islands and organized eco-tourism transformed the archipelago from an occasional destination for fishing and research to an

“The Galapagos have taught us more about biology than any other similarly sized place on earth.”



Courtesy of the California Academy of Sciences.

Giant tortoises stowed away in the basement of the California Academy of Sciences in San Francisco, collected during the Academy’s expedition to Galapagos in 1905/6.

international holiday destination. Dozens of cruise boats plied its waters, reaching every large island and many smaller ones



Tourism and population expansion shatter the isolation.

on a regular basis. Resorts sprang up on Santa Cruz and the population of Puerto Ayora and Puerto Baquerizo Moreno expanded to serve the tourists – whose numbers now exceed 150,000 a year.

This large-scale tourism coupled with population growth constitutes the third siege on island isolation. Physical separation enabled unique species to evolve on the Galapagos, much as they did in Hawaii and Madagascar. Those places lost their isolation long ago and with it most of their endemic species. The Galapagos are undergoing a similar process now.

Local fishermen and feral livestock receive most of the media attention for this change, but scientists worry more about introduced insects and plants. Biologists estimate that with air travel, cruise ships and more trade, hundreds of these foreign species now arrive every year. Cottony cushion scale first appeared on San Cristobal in 1982, for example, and now attacks dozens of native plants on a dozen different islands.

From our study of what evolved there in isolation, the Galapagos have taught us more about biology than any other similarly sized place on earth. These islands did not teach us how to preserve their biological distinctiveness, however, or if they did, that knowledge did not instill enough willpower to apply those lessons. The recent judgment of

the UNESCO World Heritage Committee that the archipelago's unique ecosystem is "in danger" serves as a milestone in a long history of declining isolation, and with it, distinctiveness. It should also serve as a wake-up call to preserve what is left before there's nothing left to save.

Edward J. Larson, right, is recipient of the 1998 Pulitzer Prize for history, teaches history of science and law at Pepperdine University and is the author of Evolution's Workshop: God and Science on the Galapagos Islands (Basic Books, 2001).



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A FRIEND REMEMBERED

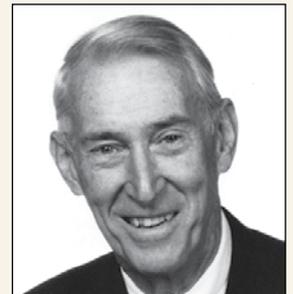
On March 6, 2008, Dr. David Challinor, Chair Emeritus of Galapagos Conservancy passed away. He was 87 years old.

Dr. Challinor was born in New York City, grew up in New England, and graduated from Harvard College in September 1942. After college and military service, he attended Harvard Law School, then moved to Texas where he spent 10 years working initially as a cotton broker in Houston, and then as a cotton farmer in West Texas.

After receiving his doctorate, Dr. Challinor moved with his family to Washington, D.C. to work for the Smithsonian Institution, where for the next 18 years, he was the Assistant Secretary for Science, with the overall responsibility for two museums (Air and Space and Natural History), the National Zoo, and the Institution's five research facilities. From 1984 – 1987 Dr. Challinor was the Smithsonian's Assistant Secretary for Research. Since 1996, he has been Scientist Emeritus at the Smithsonian's National Zoo.

Dr. Challinor served on many Boards during his illustrious career and was a member of the Galapagos Conservancy Board since its founding. He served twice as Chair and served on many of its standing committees.

It is difficult to capture in such a small space the extraordinary impact Dr. Challinor made on this institution and Galapagos conservation in general. His diplomacy, wit, and gracious nature made him an excellent ambassador for conservation throughout the world and for more than four decades in Galapagos. He is greatly admired and will be greatly missed.



Enhancing the visitor experience

CDF and GNPS have begun plans to give their jointly managed visitor center on Santa Cruz a radical facelift.

With tens of thousands of visitors every year, this is where many will be introduced to the conservation needs of the islands. CDF and the GNPS are now embarking on a multi-year plan to renovate and expand facilities for visitors, while also making it an educational resource for the local community.

There are several key objectives for the new visitor and education center: it should be self-funding; it should educate both the local community and visitors to Galapagos; and it should include state-of-the-art displays that leave a lasting impression. It's expected that the new center will be known as Charles Darwin Center for Galapagos. Funds are now needed for the construction phase of the project, which it's hoped will start in 2009.

Gardens go native

CDF's Native Garden Project is under way, an initiative that aims to provide gardeners in Santa Cruz with native alternatives to introduced species, thus helping to protect the biodiversity of the archipelago.

Galapagos has a diverse and beautiful native flora, comprising an estimated 560 native species of which 180 are found nowhere else in the world. However, these are outnumbered by non-native alien species, which at the latest count came in at 748. More than half of these are thought to have been introduced to Galapagos as ornamental plants.

The Native Garden will have the added bonus of giving local and foreign visitors a more interesting and informative experience when they visit the CDRS.

Friends of Galapagos Network

The newest member of this international network – Charles Darwin Foundation of Canada – is supporting the Pinta restoration project and the efforts to save Floreana's two critically endangered bird species. In addition, they have begun a project to protect green sea turtles in the archipelago. Later this year, the formal launch of CDF-Canada is expected to take place at the Royal Ontario Museum, which is currently hosting the critically acclaimed exhibition on Darwin: the Evolution Revolution.

In the UK, the Galapagos Conservation Trust is supporting research into the non-native parasite *Philornis downsi* that is having a devastating impact on several birds, including the two endangered Floreana species. It's also continued its high-profile Shark Campaign, supporting the CDF's marine biology department in its ongoing efforts to find out more about the archipelago's iconic shark species. Using ultrasonic and satellite tags, scientists will aim to find out information about shark movements that should be invaluable to their conservation. In December 2007, Switzerland's Freunde der Galapagos Inseln also put out an appeal to its members to support shark conservation in the islands.

The Japanese Association for Galapagos has several projects on the go, focusing in particular on the conservation of native flora. With their support, CDF now manages a "native forest" at its upland nursery in Bellavista on San Cristobal, which is producing plants for those wishing to reforest their farmland.

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