FALL 2006

GALAPAGOS news

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

BIRDS ISSUE

Special features on:

Waved Albatross
Galapagos Penguin

Plus:

Sport fishing: Threat or benefit?

Basic Science May Save the Waved Albatross

David J. Anderson is associate professor in the Department of Biology at Wake Forest University in Winston-Salem, North Carolina.

All of us who live and work in Galapagos cherish the brief glimpses of albatrosses that our visits afford. Their supremely composed flight over the waves, the elegant excitement of their courtship dances, and their unassuming countenance as they take in their world are all hallmarks of the waved albatross, treasured residents of Española Island.

My students, colleagues, and I have managed annual research visits to Española for the past 23 years, and our studies (especially those with Jill Awkerman of Wake Forest University and Kate Huyvaert of Colorado State University) have revealed a number of eye-opening facts about the lives of these calm and engaging creatures.

While socially monogamous, with significant cuddling and other public displays of affection between paired birds, females participate in startling amounts of copulation outside the pair bond. Parentage work using DNA shows that fathers frequently spend the long breeding season caring for the offspring of another male as a result!

Using a fixed nest site to house eggs is good enough for all other bird species, but not for the waved albatross. Rudimentary compared to the volcano-like structures of most albatrosses elsewhere, the "nest" is little more than a place to lay the egg, and 93 percent

(continued on page 6)

Sebastien Miazza

GALAPAGOS CONSERVANCY
Saving one of the world's great treasures

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The Value of Alliances to Conserve Galapagos

by Graham Watkins

Executive Director of the Charles Darwin Foundation

The future conservation of Galapagos will depend upon partnerships among local, national, and international institutions. Successful alliances are based on keeping things simple, ensuring leadership that establishes a vision and values, and ensuring clarity in communication.

Galapagos is a melting pot of interests ranging from tourism and fisheries businesses, through local and national government, to multilateral and bilateral organizations and international NGOs. The challenge is to bring these interests together to create and implement a shared vision for Galapagos. The CDF considers that through developing and supporting local, national, and international alliances we can begin to shift the direction of change in Galapagos toward sustainability.

Over the past year, the CDF has built upon and further developed critical alliances for sustainability. For example, the CDF has worked with the Galapagos National College, local chefs, the tourism sector, and the Frankfurt Zoological Society to initiate a culinary training school for young Galapagos residents. The CDF is working with the Santa Cruz fishing cooperative, a national NGO, and a local NGO to examine fisheries management in Galapagos. The CDF is also working with WWF, Fundacion Natura, three fisheries cooperatives, and the Galapagos National Park to support tourism development with artisanal fishers.

In addition, the CDF recently finished Project Isabela, an eight-year project working with the Galapagos National Park, the Ministry of the Environment, UNDP, a New Zealand helicopter company, and the Global Environment Facility to eradicate goats from Santiago and northern Isabela Islands. Finally, the CDF is working with the Galapagos National Institute, the Galapagos National Park, the Ministry of Environment, Lindblad Expeditions, and the Galapagos Conservancy to prepare a "State of Galapagos Report" for 2006; the report will outline the trends and issues in Galapagos as a basis for decision making.

All of these projects demonstrate the importance of working in partnership across geographical scales with various parties bringing their comparative advantages together to establish an emergent collaborative result.

I hope that you will continue to join with us in our venture to ensure the conservation of these extraordinary islands.

Harry Bosen

Penguins face a rocky future

by Henry Nicholls

That's the message from a recent study into the effects of El Niño on the tiny population of this diminutive species.

Scientists and park wardens have been monitoring Galapagos penguins since the 1970s, but it's only now that the real fruits of this long-term effort are starting to be realized, says Hernan Vargas, a Galapagos-born researcher who has just completed his doctoral studies at Oxford University's Wildlife Conservation Research Unit.

Photos above and right by Hernan Vargas show penguins being measured and weighed in the interests of science and their own future.

It has not been easy. Unmarked birds have had to be captured so that vital measurements can be taken and so that birds can be marked to identify them on subsequent visits. "They are very small, and very fast and clever, so they're not easy to catch," says Vargas. "I usually fall in the water or onto the rocks. I end up quite scratched and bruised," he says.

But all this pain has produced some gain. Vargas and his colleagues have, in recent months, published several papers on the Galapagos penguin that should prove crucial to the conservation effort in years to come.

This rare species, *Spheniscus mendiculus*, is the only penguin you'll find in the tropics. This is made possible by the cold, nutrient-rich water that rises to the surface at the equator, providing this shallow-diving penguin with the fish it needs to survive. If there is enough food for the taking, the Galapagos penguin will nest throughout the year. So if conditions are right, the population size can increase dramatically from one year to the next. That said, the total number of Galapagos penguins has been hovering at just under 1,500 individuals for many years now.

The pint-sized Galapagos penguin is the rarest of its kind and is heading precariously close to extinction.

This was not always the case. Up until the 1980s, there were probably nearer 4,000 penguins in the archipelago. Since then, the frequency and severity of El Niño events seem to have increased, and this is almost certainly taking its toll on endangered seabirds like the Galapagos penguin.

The El Niño events of 1982-1983 and 1997-1998 were particularly strong, with the sea temperature rising by around 3°C. On both occasions, relatively healthy penguin numbers crashed to just a few hundred birds and on both occasions, the population was slow to recover. What's more, El Niño events seem to result in a higher mortality of females than males, skewing the sex ratio in subsequent years.

"This is of real concern," says Vargas. If one El Niño event follows too closely on the heels of another, there's a risk that the penguin population will not have had time to recover, he says. Mathematical models predict that under the current El Niño scenario, the Galapagos penguin has a 30 percent chance of becoming extinct this century. Once other threats like disease outbreaks, oil spills, and the presence of non-native predators, such as feral cats, are added into the equation, things look even more bleak.

There's more. The penguin sits at a telling position in the food chain. "If a bird population is declining for several years," says Vargas, "it means something is happening to the habitat which is damaging for biodiversity as a whole."

Galapagos is the only archipelago in the world where no bird species has ever become extinct. "Collaboration is vital if conservation projects are to work," says Vargas. "The project I'm doing is supported by a range of international funders and Galapagos-based organizations. It's very important to have

that combination of local involvement and international support and expertise. Preserving biodiversity in the Galapagos Islands is close to my heart because it is my home – but it is an issue that's important for the whole world."

Henry Nicholls is a freelance science journalist and author of ***Lonesome George: The Life and Loves of a Conservation Icon*** *(Macmillan, 2006).*

NEWS FROM GALAPAGOS

PROVIDED BY THE CHARLES DARWIN FOUNDATION

David Hosking/FLPA

Evolution in reverse?

Studies of medium ground finches on Santa Cruz Island have suggested that some of them are undergoing a process of "reverse evolution." It seems that once upon a time they all had similar-sized bills, but then evolutionary pressures took a hand in things, and, according to information from the 1960s, the birds diverged into two populations, which had either large bills or small bills. Only rarely did they have medium-sized bills. This shift was probably because the birds were specializing in eating seeds of different sizes.

Recently, however, Andrew Hendry, an ecologist from McGill University in Montreal, Canada, has been measuring bills and has found that around the town of Puerto Ayora, on Santa Cruz, finches with intermediate, middle-sized bills are the norm. Hendry and his colleagues say that only well away from town, in unpopulated areas, did the two different bill sizes occur.

Why are the medium ground finches reverting to a common beak size? The reason, say the researchers, is either that humans have introduced plants with intermediate-sized seeds, or that they are feeding the finches with rice. All of the birds can eat rice, says Hendry, so there's no point in having differing beaks. One size fits all, it seems.

Source: *Proceedings of the Royal Society.*

Sea lions caught in shark-fishing net

CDF

Illegal fishing continues in the Galapagos Marine Reserve. The Ecuadorian Navy and Galapagos National Park rangers stopped a small fishing boat, the *Galapagos Adventure*, in July off the east coast of Isabela. On board they found two sea lions entangled in a heavy-duty net of a kind that is used to catch sharks. Two more similar nets were found on the boat. Fortunately, the sea lions were freed.

When the rangers and fishermen arrived at Puerto Villamil, the latter managed to escape, but their identities were known, and it was likely that they would be caught and charged.

Pinta's extraordinary recovery

More than 20 previously unregistered moth species, an abundance of known moth species, and possibly a new species of beetle were recorded by CDF scientists working with colleagues from the Geneva Museum of Natural History and Wake Forest University, USA, during an expedition to isolated and rarely visited Pinta Island. Pinta is well known as the birthplace of the giant tortoise, Lonesome George, but the team was there to evaluate the recovery of the island following the eradication in 2001 of the goats which had once ravaged the island. They also wanted to study the evolutionary biology and chemical ecology of moths. Because insects have a short generation time and specialized feeding habits, they are an important indicator of the health of any ecosystem.

Damaged ecosystems generally have very low levels of endemic species. However, the international team's discovery of large numbers of endemic species on Pinta, and the impressive recovery of the native vegetation on which they depend, clearly confirmed that islands which have been heavily affected by introduced species can recover when the intruders are removed.

Russian tourists cruise Galapagos in a mini-submarine

Two Britons were detained in July for illegally piloting a tiny tourist submarine in the Galapagos Marine Reserve. Also detained were seven crew members of a Panamanian ship that carried the undersea craft. "The use of submarines in the Marine Reserve is forbidden," said Edwin Naula, the Galapagos National Park's tourism officer.

According to officials, the submarine was transported from Panama to Galapagos on board the *Cebaco Bay*, which had arranged to meet up with a luxury yacht, the *Constellation*, carrying 24 Russian tourists. Four of the passengers boarded the submersible near Floreana Island, where they went for an underwater cruise, said Alan Whitfield, the British captain of the craft.

Although the mini-submarine, owned by a British company, Silvercrest Submarines, and the Panamanian ship were being held by the Ecuadorian Navy at San Cristobal Island, the yacht and its Russian passengers are understood to have escaped from Ecuadorian waters.

New National Park Director

The post of Director of the Galapagos National Park is a great challenge, and it is a challenge that Raquel Molina Moreira has recently taken on with enthusiasm. She is the first woman to occupy the post, and was appointed in early 2006 by the Environment Minister, following a transparent and professionally run selection process.

Forty-year-old Molina has wide experience in conservation. While still a biology student she worked as a volunteer at the Charles Darwin Research Station. The Station later gave her a permanent position as Assistant for Environmental Education. Having obtained her degree at the Universidad Estatal Santiago de Guayaquil, she became Coordinator of a project to protect the Cerro Blanco

Forest. After this Molina obtained a degree in Environmental Relations. She later studied Management of Coastal Ecosystems in Mexico, and completed a course in Environmental Impact in Malaga, Spain.

Molina has worked with the community of Puerto Hondo, a small fishing village, where she successfully implemented a project designed to create alternative work sources within the tourist sector. She also worked for several years in the Association "6 de Julio" which is made up of five community groups that depend on the collection of crabs in the mangroves of the Gulf of Guayaquil. More recently, she was employed in Galapagos as Coordinator of the Inter-Institutional Committee for the Management of Introduced Domestic species.

As Director of the Galapagos National Park, Raquel Molina's priorities will be restructuring the staff, publishing the new Park Administrative Statute, and implementing the Park's Management Plan.

A World Movement to Conserve Galapagos?

In May 2006 Their Royal Highnesses the Grand Duke and Grand Duchess of Luxembourg hosted a splendid and inspiring weekend for a key group of specially invited supporters of Galapagos.

The Grand Duke is a Board member of the Charles Darwin Foundation and ever since his first visit (of many) to the islands in 1988, he has done much to bring together those who support the work of the scientists and conservationists in the islands. To reinforce their commitment, the royal couple invited major benefactors to their home at the end of May to pay tribute to their various efforts.

The Grand Duke presented Sven-Olof Lindblad, of the United States, with a personal decoration in recognition of the great achievement that he and his company, Lindblad Expeditions, have made in raising almost $3 million from his passengers for Galapagos conservation. CDF also honoured Sven by naming a new species of Galapagos moth after him.

In addition to Sven-Olof Lindblad, the other guests represented a varied cross-section of generosity. Some had made significant personal donations, some had enabled access to trusts and foundations, while others had provided commercial support at little or no cost. Some were planning major fundraising events, and one had pledged to give a Euro cent for every pizza slice he expects to sell at sporting venues in several countries. Many were Board members of the various Friends of Galapagos organizations to which they had contributed much time and money.

Such a gathering made it clear that Galapagos support has moved on from the early days when the Charles Darwin Foundation just about survived on a little Ecuadorian government funding, with UNESCO paying a salary or two, and some bilateral grants appearing at irregular intervals.

Nowadays, CDF anticipates that its five million dollar annual budget will come from a variety of sources led by the Friends of Galapagos Organizations. The first FOGO – originally named the Charles Darwin Foundation, Inc., but now known as Galapagos Conservancy – started in a small way 20 years ago in the United States. Today it raises more than $2 million every year. Since then other FOGOs have become a constant, reliable source of relatively unrestricted money which allows CDF to undertake the many tasks it now performs.

The support of people all over the world is vital to continue with the protection of these enchanting islands.

The Cleve Hickman Galapagos Research and Conservation Fund

Recognizing decades of dedication to students and Galapagos

In late 2005, a group of nearly 50 Washington and Lee University alumni and family members returned to their alma mater to participate in a weekend of Galapagos events. They were invited by Dr. Cleve Hickman, their former professor and mentor, who led them on expeditions to Galapagos in their junior and senior years.

Dr. Hickman first visited Galapagos in 1974 on a family trip with his wife, Rae, and his mother and father. During this trip he decided that Galapagos afforded special learning opportunities for his students. Over the next 20 years, Cleve led over 150 Washington and Lee Biology students on 12 expeditions to Galapagos. Beginning with the seventh field trip, students carried out the first intertidal surveys of Galapagos invertebrate fauna. This led to the development and publication of a series of field guides on Galapagos marine life, including sea stars, sea cucumbers and other echinoderms, marine mollusks, crustaceans, and corals. These publications continue to be important tools for scientists working in Galapagos.

During their Galapagos reunion, several of Dr. Hickman's former students decided to launch an endowed fund named in honor of Cleve to honor his dedication to W&L students and his scientific accomplishments that have contributed to a greater understanding of marine life in Galapagos. They have since undertaken a campaign to invite fellow alumni, Washington and Lee faculty and others who know Dr. Hickman or are interested in Galapagos marine conservation to contribute to the Fund.

The Cleve Hickman Galapagos Research and Conservation Fund will be the first named endowed fund to specifically support conservation in the archipelago. Managed by Galapagos Conservancy, it will provide ongoing support for marine research and conservation carried out by the Charles Darwin Research Station in Galapagos.

Gifts and pledges made to the Fund during 2006 will be matched on a 1:1 basis. Please email Galapagos Conservancy at **ambassadors@galapagos.org** for information about how to make a tax deductible contribution that will simultaneously recognize the contributions of Dr. Hickman and contribute to the conservation of the Galapagos archipelago.

Mike Keenan

(Albatrosses, continued from page 1)

of eggs soon find themselves, and their parents, out in the open.

The incubating parent intentionally scoots the egg away from the nest, a mysterious behavior since the chance of hatching decreases as the amount of movement increases. The typical egg moves several meters during the incubation period, and some of them up to 40 meters (130 feet), ending up typically 1.2 m (about 4 feet) from the original laying spot. This phenomenon accounts for up to 80 percent of all egg failures, and its cause remains obscure.

Paula Herman

Breeding birds do most of their feeding not around Española, and not even within Galapagos. Satellite and GPS trackers show that parents leave their egg or chick and take a five-day trip to the waters off the coast of Peru. There they forage intensively and transport the booty back to Española, with a tailwind reducing the length of the return trip to four days. The total round-trip can easily exceed 3,000 km (around 1,900 miles) during more than two weeks. Electronic activity monitors show that most of their active foraging occurs during daylight hours, and at night their GPS tracks show them drifting along with the prevailing current.

Some Galapagos species face life-threatening problems in the islands in the form of predatory introduced species, habitat destruction, and human harvesting. The lucky albatross has escaped such risks so far, yet our recent data indicate a looming cloud outside the archipelago.

Española is the equivalent of a suburban residence for the waved albatross, and they commute to the Peruvian Upwelling to work. They forage there intermingled with the extensive small-boat fishery for sharks, rays, tunas, and other fishes. In 2004, we placed leg bands on over 2,500 birds in a mass-banding effort to better estimate year-to-year survival. To our dismay, one percent of these birds turned up dead on fishing boats in the next 12 months.

At the same time, we discovered that the annual survival rate of adults dropped from the historical level of 95.3 percent to 92.5 percent, a dramatic decline for a potentially long-lived species. The albatross life history combines an inflexible, low reproductive rate with a long life. The slow reproduction probably permits the long life, by minimizing reproductive effort and keeping the adults from getting run-down. In combination, long life and slow reproduction can yield a stable population.

However, the reproductive rate stays low even if adult survival drops, and the population size should enter free-fall. Counts of the total population in 1994 and 2001 provided a grim corroboration of this prediction, indicating a dramatic decline in population size. Most readers will be horrified by the knowledge that at least some of the albatrosses dying in Peru were caught as food. They were a target species of the fishery, caught on a baited hook set specifically for a bird that strayed too close to a fishing vessel.

Male waved albatrosses, representing 82

percent of the Peruvian band returns, are far more vulnerable to fishery death than females. The deficit of males has a highly negative effect on population stability, leaving some females ready and able to breed but without a partner to provide bi-parental care.

Analysis of stable isotopes of carbon and nitrogen in the blood of males and females suggests that males have a competitive superiority on the feeding grounds used by both sexes, with males taking desirable prey higher in the food chain. Electronic activity loggers suggest the same disparity, with males spending less time searching for food than females do.

We suspect that this competitive advantage of males, probably related to their larger body size, backfires during fishery interactions. Both sexes may be attracted to the apparent easy lunch around fishing vessels, but males may be more "successful" in pursuit of baited hooks and fish caught in gill nets. The adult population on Española is now female-biased, and our molecular genetic studies of hatching, fledging, and young adult sex ratios indicate that males and females are equally numerous during these stages. The sex ratio bias seems to arise during adulthood; fishery mortality of males is a prime suspect. Widowed females do not breed as a result.

With such information in hand, the governments of Ecuador and Peru have entered into discussions to mitigate this developing conservation emergency. It is an encouraging development that brings into clear focus the vast potential of basic science in Galapagos to inform conservation policy and to engage political leaders in the pursuit of national and, in this case, international solutions to conservation problems.

Eva Powers

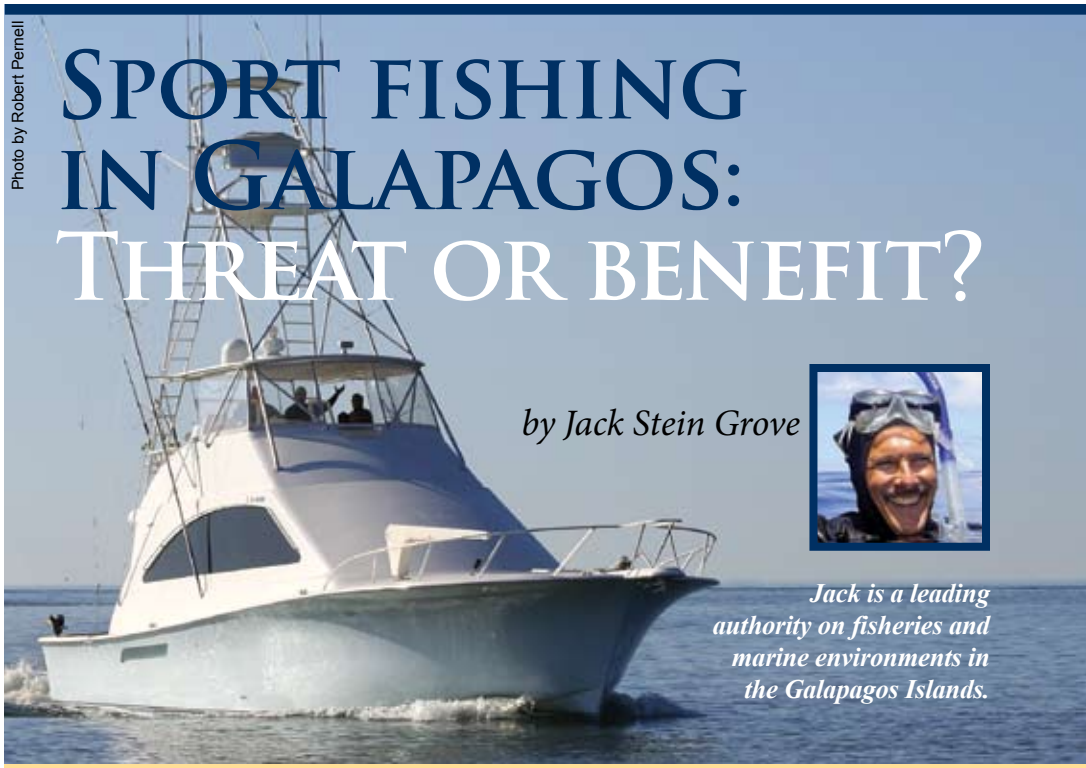

Photo by Robert Pernell

Sport fishing in Galapagos: Threat or benefit?

by Jack Stein Grove

Jack is a leading authority on fisheries and marine environments in the Galapagos Islands.

Approximately 12 percent of the world's most biologically diverse terrestrial areas are protected as national parks, world Heritage Sites, corridors, and wildlife sanctuaries. Unfortunately, less than one percent of the world's oceans are protected. With so few marine sanctuaries, why introduce into one of the few marine parks a "sport" that includes killing of marine life? This is the state of affairs in the Galapagos. Clandestine tour operators are selling sport fishing trips, and shop windows in Santa Cruz and San Cristobal display foot-long lures with three sets of treble hooks (making catch and release impossible).

The concept of "catch and release" fishing in Galapagos is a façade. Some of the fishes caught by illicit sport fishermen are already showing up in local restaurants and markets. The income that is purportedly to promote the local economy fills the pockets of operators in Guayaquil and Quito. This growing threat is complex and unlike any other that the islands have ever faced. The target species for the new fishery are billfish: Pacific sailfish, black marlin, Pacific blue marlin, short-billed spearfish, and swordfish.

Many of these fish are likely to be released and some will probably survive. The other species which are quick to take a hook include some of the world's most desirable food fishes, such as tuna and mahi-mahi. These, and many other kinds, including some endemics will not be released. The concern however, is not limited to fisheries management; it is the multifaceted challenges for the Galapagos National Park Service, some of which are insurmountable.

Enter the words "Galapagos Sport Fishing" into any internet search engine and you will find an array of travel tips, details about fishing, how to book a boat, and even how to bring home your catch. Alongside these are articles from conservation organisations denouncing the activity. If you go online to research this threat to Galapagos, be sure to review the statement from the Galapagos National Park Service, warning that sport fishing is not legal within the boundaries of the marine reserve, which extend seaward 40 miles from the periphery of the Archipelago.

Given the impossibility of an absolute release fishery, efforts must begin immediately to determine how the fish brought into port by sport fishermen will be accounted for by the authorities. Commercial sales of fish captured by sport fishermen could be prohibited by law. This regulation has been applied successfully in Florida with protected fishes such as snook, *Centropomus undecimalis* and Atlantic swordfish, *Xiphias gladius*.

The fishing industry in Galapagos has historically been regulated as a socio-economic entity; however, this entity now

(continued on page 8)

(Sport Fishing, continued from page 7)

has considerable political power and this will continue to be a factor in establishing an environmentally friendly sport fishery. The local fishing community must be incorporated into the development of a sport fishery as a political entity.

If the new fishery is to be sustainable and support the local economy with only minimal impact on the ecosystem, the conservation community must be pro-active before any regulations come into effect. With all due respect to the Ecuadorian Government, the ambiguities which burden the regulation of all other fisheries in Ecuador must be avoided in Galapagos.

The Galapagos Islands are already witness to the arrival of several multi-million dollar fishing yachts, in spite of the fact that there is still no management system in place to monitor and regulate sport fishing. We must not allow another "gold rush", such as the one brought on by the sea cucumber harvest, which resulted in the decimation of the resource and a multitude of new socio-economic problems.

Monthly Contributor Program Reduces Fundraising Costs

Our **Monthly Contributor program** offers an easy way for you to provide ongoing support to address the conservation challenges in the Galapagos Islands. By joining our monthly contributor program, you'll also help us reduce our fundraising costs.

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1) A biannual subscription to *Galapagos News* for the length of your gift
2) *Galapagos E-News*, our bimonthly email newsletter
3) Invitations to private lectures and other educational activities related to Galapagos conservation

To learn more about the Galapagos Conservancy Monthly Contributor Program, please visit our website at:

https://www.galapagos.org/membership/monthly.html

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