# DARWIN NEWS

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Promoting biodiversity conservation and the sustainable use of resources

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# Project news

## PhDs awarded [10-025]

TWO Darwin Fellows - Suzan Benedick and Nazirah Mustaffa - have recently been awarded their PhDs from Universiti Malaysia Sabah. Suzan and Nazirah carried out research on the project 'Molecular tools for promoting biodiversity in tropical forest fragments in Sabah, Borneo'. Suzan investigated impacts of tropical forest fragmentation on butterfly genetic diversity, and Nazirah studied the use of molecular techniques for resolving the taxonomy of cryptic butterfly species. Suzan is currently employed on a new Darwin Initiative project (14-022) and Nazirah is now a lecturer in genetics at Universiti Malaysia Sabah.

## Fugro-GEOS prize [12-021]

LAURA Baxter has won the Fugro-GEOS Postgraduate Award from the Society of Underwater Technology for her M.Sc. dissertation on "A study of reef fish communities of Las Perlas Archipelago, Panama".

## Las Perlas protected [12-021]

THE Panamanian Congress debated legislation setting up marine conservation management zones around Las Perlas Archipelago during the week 21-25 November 2005. The zones are being designated following on specifically from the survey and research work carried out by our Darwin project over the last 2½ years. Dr Hector Guzman, the host country counterpart on the Darwin project, has been advising and lobbying Congress members on the work. The Law for Perlas was approved in a First debate. A Second debate will follow shortly to conclude the legislation. The Law says: "Declara al Archipielago de Las Perlas como Zona Especial de Manejo y se dictan otras disposiciones" (the Las Perlas Archipelago is declared as a Special Management Zone, and other orders are passed).

## DarwinNet and the VI National Peruvian Ornithology Conference [13-006]

DURING October (9th – 12th), BirdLife International and their project DarwinNet (the Peru/Ecuador dry forest clearing house mechanism) played a pivotal role in the success of this conference.

Held in Chiclayo in north Peru, the event was attended by more than 400 people.

During the event the DarwinNet mechanism held a workshop with experts from Peru and Ecuador on the development of a longer-term strategy for the conservation of the birds of the Tumbesian Endemic Bird Area. In many areas this is directly related to BirdLife´s Important Bird Area programme for both countries.

The conference was organized by in-country partner organization Naturaleza y Cultura Internacional (who run the DarwinNet mechanism) and the Asociación Cracidae. More information on DarwinNet (in Spanish) can be found at: http://www.darwinnet.org.

## Endangered species of bat rediscovered on Montserrat [14-027]

A biological assessment, led by the Durrell Wildlife Conservation Trust in partnership with the Royal Society for the Protection of Birds, Royal Botanic Gardens Kew, Department of Forestry and the Montserrat National Trust is currently underway in the Centre Hills on Montserrat.

After the volcanic eruptions of 1996/7, the Centre Hills are the largest intact forest area remaining on Montserrat. They are the last natural refuge for most of the island's wildlife, including those of global conservation concern such as the Montserrat Oriole *Icterus oberi* and Mountain Chicken *Leptodactylus fallax*.

The purpose of the assessment is to compile an inventory of the fauna and flora of the Centre Hills, map spatial patterns of biodiversity and investigate the abundance and distribution of key species.

Scott Pedersen (South Dakota University) and Will Masefield (Durrell Wildlife) were out on Montserrat in August and captured all 10 species of bat known to have historically occurred on the island, including an endangered species *Chiroderma improvisum* not recorded for over 20 years and an endemic sub-species *Sturnira thomasi vulcanensis* thought to be extinct.

This Darwin-funded project aims to strengthen the capacity of Montserratians to conserve the Centre Hills. Apart from the biological assessment, project activities include conducting a socioeconomic assessment, strengthening legal frameworks for protected area management, fine-tuning a long-term biodiversity monitoring protocol, capacity-building among counterpart staff, and developing a management plan for the Centre Hills through a participatory process.

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# From the Field

## Centre of Diversity in Cameroon is Top for Tropical African Plants [8-038]

RECENTLY published by RBG, `The Plants of Kupe, Mwanenguba & Bakossi Mts' (www.kewbooks.com) reveals that this area, of c. 2390 km$^2$, contains 2412 vascular plant species, of which 82 are strictly endemic to the checklist area and 232 are Red Data taxa, threatened with extinction. Within the last few months, follow-up work by a Kew-National Herbarium of Cameroon expedition at Mt Kupe uncovered additional species in the area, bringing the total to 2440 species. This figure places Kupe-Bakossi as the highest documented in mainland Tropical Africa as a `Centre of Plant Diversity`.

*Justicia leucoxiphus* (Acanthaceae) is known only from five locations, all occurring within SW Province, Cameroon. Photographed in Kodmin, this has an IUCN "endangered" rating. Photographer: Martin Cheek © The Board of Trustees of the Royal Botanic Gardens, Kew.

Amongst the 84 such centres listed for Africa in IUCN-WWF's Centres of Plant Diversity (Davis, Heywood & Hamilton, 1994), no other centre in Tropical Africa apparently has documented as many strict endemics, as many Red Data species or as many plant species in total. Since about half of Kupe-Bakossi remains

unexplored for plants, this total is likely to be surpassed. This unexpected turn of events partly reflects the poor documentation of plant species of many `Centres of Plant Diversity', several of which, such as the Crystal Mts of Gabon or Cross River National Park of Nigeria, might otherwise contend with Kupe-Bakossi. It also reflects the incredible diversity and high endemism of this under-explored area, previously unsuspected to be of such importance for plant conservation and biodiversity.

Much of Kupe-Bakossi is now in the process of being formally protected by the Cameroon Government.

*Kupea martinetugei* (Triuridaceae) is known from only 2 sites, both at Mt Kupe. This tiny, chlorophyll-lacking herb, was named in honour of Mt Kupe and Martin Etuge, the botanist who first discovered it, and has an IUCN "critically endangered" rating. Photographer: Martin Cheek © The Board of Trustees of the Royal Botanic Gardens, Kew.

## Good and bad news from the Galapagos Islands *[12-018]*

THE Galapagos archipelago is one of the most important areas for birds in the world. More than half of the bird species are endemic, and many are iconic for both scientists (Charles Darwin first studied them in 1835) and visitors alike. Between 2003 and 2005, the Darwin Initiative, through its project "Climate change and conservation of endemic birds", has been studying the effects of El Nino and climate change and the interaction of climatic factors with introduced predators on the persistence of three endemic bird species: the Galapagos penguin, the flightless cormorant and the mangrove finch. Here we briefly analyse the bad news (threats to birds) over the last decade, and the good news (Darwin Initiative achievements) over the past two years following the implementation of the project.

**Bad news**

Increasing political instability, rapid economic and population growth, over fishing pressures, historically introduced species, and, more recently, the potential effects of massive tourism, are increasingly threatening the long-term conservation of these unique birds and their ecosystems. Although no bird species has as yet become extinct, there are clear warning signs that bird populations are declining, and several of them will be endangered in the near future if current trends continue. A recent Population Viability Analysis (PVA) workshop conducted by the Darwin Initiative, the IUCN-CBSG and the Darwin Initiative local partners (the Galapagos National Park Service and the Charles Darwin Foundation) indicated that the Galapagos penguin faces a 30% probability of extinction in the next 100 years due to the effect of increasing El Nino episodes. More ominously, the probability of extinction increases even more when adult birds die through entanglement in fishing nets or from predation by exotic species. In fact, in April-June 2005, it was confirmed that feral cats were preying on adult penguins on southern Isabela Island.

Galapagos penguin. Endangered species threatened by El Nino episodes, feral cats and fishing activities. Photo: Hernan Vargas.

**Good news**

The Darwin Project is supporting species and ecosystem management. Through the application of novel technologies and training of local students and park rangers, the project has collected copious quantities of data on bird ecology, predators and climatic variables. Notable achievements include:

- using the Galapagos penguin, flightless cormorant and mangrove finch as model and flagship species to symbolize the conservation status of the islands.
- beginning to understand the effects of El Nino, climatic variability and the influence of climate change on the long term conservation of endemic birds
- better understanding of the combined effects of El Nino and introduced predators on population changes of endemic birds.
- provision of science based recommendations for the management plans of the Galapagos National Park Service and for the Galapagos Marine Reserve.
- training and providing qualified local support to influence the decision-making process for sustainable management of the Galapagos biodiversity.

**The future: new hope**

The good news is that there is new hope for the future of the Galápagos Islands. The main institutions and stakeholders in the Galápagos are willing to collaborate to find solutions. The international community is concerned about the current challenges and recognizes the need for the long-term preservation of this unique natural world heritage site.

Training. Ecuadorian university students marking a cormorant with a PIT Tags. See cormorant nesting (right). Photo: Hernan Vargas.

Participants of the Population and Viability Analysis Workshop (PVA) for the conservation of the Galapagos penguin. Held in February 2005 in Puerto Ayora, Santa Cruz, Galápagos. Photo: Hernan Vargas.

## Sustainable management of Guyana's biodiversity El Dorado *[12-019]*

THE Darwin Initiative 'Sustainable management of the Rupununi: linking biodiversity, environment and people' project is an international collaboration between Royal Holloway, University of London, the Wildfowl & Wetlands Trust and the Open University, working with both government and non-government conservation and development organisations within Guyana. These include the Iwokrama International Centre for Rain Forest Conservation and Development, the Makushi led North Rupununi District Development Board, the Guyanese Environmental Protection Agency and the University of Guyana.

The North Rupununi is comprised of a mosaic of savanna, wetland and forest habitats, whose waterways support more than four hundred varieties of fish, which in turn supply a food chain to endangered species such as the Black Caiman, Giant Otter, Harpy Eagle and the Giant River Turtles. The area is home to the Makushi people who have depended on the natural resources for their livelihoods for centuries, but whose way of life is today under considerable threat from activities such as mining, logging and over fishing. The Makushi believe that without substantive evidence to indicate the importance of the area to the national and global community, they face an insecure future as these legal and illegal activities increase: a threat, which has been exacerbated by the recent paving of a road from Lethem to Georgetown, dissecting the Rupununi and linking the northern Amazon to the Caribbean Sea.

The endangered giant otter. Photo: Matthew Simpson.

The objective of the DI project is to produce an adaptive management plan for effective biodiversity management of the North Rupununi waterways. This will be achieved through training and continuing professional development of local counterparts, integration of stakeholder knowledge and consultation, and monitoring of habitat quality and key indicator species. Monitoring is being carried out every month in thirty waterbody sites including savanna and forest lakes, rivers and wetlands. By comparing 'impacted' with 'non-impacted' sites, it is hoped that trends will be detected which can be used to develop sustainable management recommendations for the region.

2005 has been an important year for the project. The 11 Guyanese staff members were trained in participatory methods, data analysis and spatial data interpretation, and they have taken these skills to organise regular consultative community visits, as well as a national stakeholder forum, which brought together the key players in the management of the Rupununi. Building this capacity has put ownership of the project firmly in the hands of the Guyanese collaborators, and the role of the British staff has moved to supporting intervention. In addition, a University of Guyana lecturer, Calvin Bernard has completed his Masters training in development management, skills which will aid him to develop new courses and capacity for biodiversity conservation in the university sector. Finally, the project team has secured funding from the Economic and Social Research Council, UK, to support the DI project by providing an on-line platform for training, stakeholder engagement and information sharing for natural resource management in the Rupununi.

Consultation with local Makushi community members. Photo: Jay Mistry.

One of the thirty monitoring sites. Photo by Matthew Simpson.

As we go into the final year of the project, the main objective is to secure long-term engagement by a range of stakeholders in implementing the adaptive management plan. Part of this work will involve an assessment of the capacity within Guyana to implement and sustain the management recommendations for this biodiversity El Dorado.

## 'Extinct' coral species is rediscovered in the Galápagos Islands *[14-048]*

THE first diving expedition of the Darwin project 'Galápagos Coral Conservation: Impact Mitigation, Mapping and Monitoring' took place in September 2005. The international team of 16 scientific researchers and fishermen were brought together from the UK, France, Australia, Ecuador, Columbia and Venezuela to explore the coral reefs of the northern islands of Marchena, Wolf and Darwin.

The Hammerhead Shark (Sphyrna lewini), often in shoals, was a regular companion during the coral reef diving surveys. Photo: Alex Hearn.

The principle task of this excursion was to undertake the first of a number of underwater surveys looking at the extent and health of the last remaining coral reef habitats in the Galápagos Islands, and to establish a series of permanent mooring buoys to avoid further coral damage from both fishing and tourist boat anchors.

The islands of Wolf and Darwin in particular form a distinct and isolated biogeographic zone in Galápagos that supports a high level of biodiversity, including priority conservation endemic corals and associated species, subject to extreme 'natural' climatic and anthropogenic pressures. Climatic fluctuations under recent El Niño events in the region, however, have been particularly damaging for the local coral populations - extensive coral reefs were reduced by 97% in 1982-83 and further compounded to 99% losses in 1997-98.

The expedition team. Photo: Sandra Bessudo.

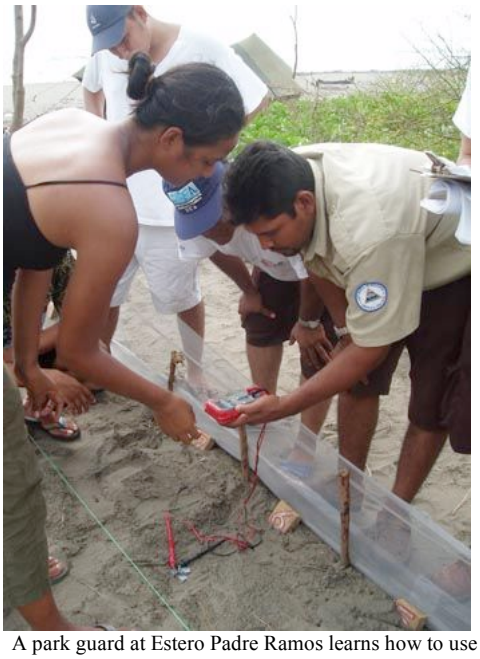
A particularly exciting discovery was the presence of several colonies of the coral species *Gardineroseris planulata* that was thought to have gone extinct during the 1998 /99 El Niño. Ángel Chirboga, coral taxonomist of the Charles Darwin Research Station reports that "four patches at Wolf and another two patches at Darwin were located, of sufficient size that we believe these are relic colonies that survived the two El Niño events." Terence Dawson from the University of Edinburgh and project leader, comments "This is a very encouraging start to the project and demonstrates the importance of continual monitoring of biodiversity at locations that are remote and inaccessible." This discovery, and other data collected during the course of the project will be used to produce a *Corals of Galápagos* field guide, co-authored by Ángel, Cleveland Hickman, Emeritus Professor from Washington and Lee University and Dr. William Ober, from Cornell University, USA.

The 'rediscovered' coral species *Gardineroseris planulata*. Photo: Ángel Chirboga.

## Hands-on conservation management in Nicaragua *[14-058]*

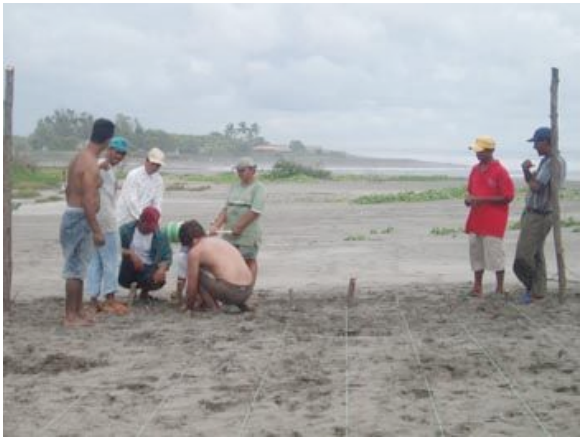
BORDERING Honduras and Costa Rica, with coasts on the Pacific Ocean and the Caribbean Sea, Nicaragua hosts an amazing wealth of natural resources and biodiversity. The largest country in Central America, its landmass serves as a vital link in a chain of humid forests stretching from Mexico to Colombia, known as the Mesoamerican Biological Corridor, whilst its offshore waters and coastlines provide important nesting and feeding habitats for globally significant sea turtle populations.

However, Nicaragua is also one of the poorest countries in the western hemisphere, and with more than half the population living below the World Bank poverty line, balancing people's needs to make a living with their desire to preserve biodiversity is a complex issue. Of the 76 protected areas in the country, only seven are currently under active management, due to a chronic lack of trained personnel, funds and resources. Through the Darwin-Initiative funded project, "Capacity Building for Sustainable Management of the Nicaraguan Pacific North Region," the Society for Environmental Exploration has designed a 190-hour training programme focused on providing key stakeholders and institutions with the necessary skills needed to sustainably manage and monitor Nicaragua's dwindling yet precious natural resources. Working in collaboration with local NGOs, the Ministry of the Environment and the University of León, the programme is being hosted within the protected areas of Estero Padre Ramos, Isla Juan Venado and Volcán Cosigüina. Participants include park guards, community members and university students, whom, upon completion of the programme, will gain a certificate in Conservation Management. The course curriculum combines theoretical learning with practical fieldwork principles, and has been designed to cover a spectrum of different subject areas, including tropical ecology, data recording, eco-tourism and educational awareness campaigns. Practical training also forms a core component of the course, allowing the participants to obtain vital experience on how to conduct biodiversity surveys and species monitoring plans for each area.



A park guard at Estero Padre Ramos learns how to use the temperature probes at the hatchery.

In addition to the training programme, the Society for Environmental Exploration (SEE) has been assisting with the implementation of protection plans for the five sea turtle species that come to nest on Nicaragua's North Pacific beaches. Since October, SEE has set up four hatcheries along the coastline coinciding with the governmental ban prohibiting the harvesting of eggs from natural nest sites until the end of the year. Interactive workshops were held with community members and training was provided on the correct method of nest relocation, recording data, and the use of temperature probes, which have been placed in a number of nests to log the temperature changes that occur during the incubation period. Under the guidance of the park guards, teams of community volunteers are now patrolling the beach each night, helping to reduce illegal egg harvesting as well as collecting vital data on the nesting population of these critically endangered animals.



Community members of Isla Juan Venado mark out nest squares in the new hatchery.

The success of conservation efforts in the region is reliant on the actions of natural resource users and managers within Nicaragua. Through the provision of training to local communities and the promotion of their active participation in current monitoring and evaluation programmes, it is hoped that they have the means to instigate and maintain future long-term conservation strategies for the region.

Bird identification at the ranger station.

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