



Department
for Environment
Food & Rural Affairs



Darwin Initiative Newsletter

July 2013

Welcome to another issue of the Darwin Initiative newsletter and the second one of 2013 - the Darwin Initiative's 21st year. Thank you to all the project leaders who have submitted articles and photos. This issue is dominated by marine projects and the great work done by our dedicated project teams on marine issues.

The deadline for Stage 1 applications for Main projects has just closed and we have been inundated with applications. The Darwin Expert Committee will be kept busy in the coming weeks reviewing all the applications that we received.

The deadline for Darwin Plus and Post projects is September, so there is still time to submit applications for those programmes, as well as the Fellow and Scoping funds, whose calls are not yet open, but are expected during the autumn.

There are a lot of changes in personnel from the Darwin side. Lesley King is on maternity leave until 2014, so Rebecca Adler at LTS, is covering her role. I appreciate all your help and patience as Lesley is a real asset to the Darwin Initiative, and leaves behind big shoes to fill!

From Defra we welcome Clare Hamilton, who is replacing Eric Blencowe as Head of the Darwin Secretariat within Defra. Sally Cunningham remains as the main day-to-day contact on the Darwin Initiative within Defra but is now also supported by Huw Joynson.

To find out more, check out the website darwin.defra.gov.uk and Twitter [@Darwin_Defra](https://twitter.com/Darwin_Defra).

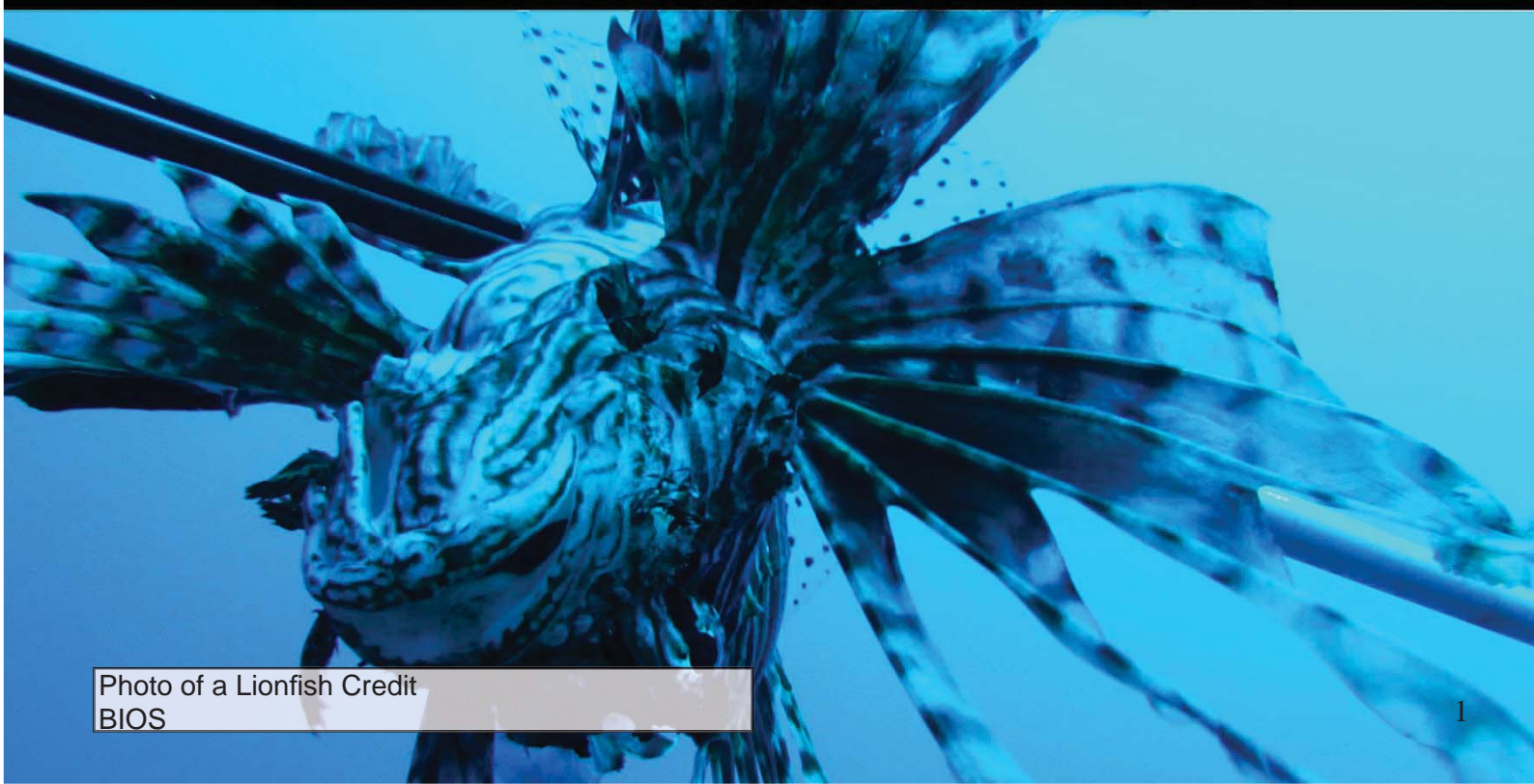


Photo of a Lionfish Credit
BIOS

Bermuda Invasive Lionfish Control Initiative (DPLUS001)

In the western Atlantic, the invasive lionfish threatens native populations of economically and ecologically important fish species, impacting the overall health of coral reef ecosystems. Controlling the spread of this invasive species in Bermuda's waters is vital to minimizing these impacts, as well as potential secondary impacts on fisheries, tourism, and public health.

In 2012 the Bermuda Lionfish Taskforce was formed after a stakeholder workshop that highlighted the need for comprehensive and coordinated lionfish management. With this in mind, the Bermuda Invasive Lionfish Control Initiative was developed by Taskforce partners, including the Bermuda Institute of Ocean Sciences (BIOS); the Bermuda Zoological Society (BZS); the Bermuda Aquarium, Museum & Zoo (BAMZ); the Bermuda Department of Conservation Services (DCS); the Marine Resources Section of the Bermuda Government Department of Environmental Protection (DEP); and the Ocean Support Foundation (OSF).

This collaborative initiative will provide key scientific data required for the development and implementation of an island-wide management plan, including information on lionfish abundance and distribution, feeding ecology, and population dynamics. Simultaneously, the project is undertaking the development of a lionfish-specific trap to facilitate the large-scale, long-term removal of the species from deeper waters that are inaccessible to volunteer culling efforts.

Since beginning field work earlier this summer, Project Partners have completed surveys at the first of five depth bands and collected over a dozen specimens for gut content analysis and tissue sample analysis. Data from these analyses will be used to determine feeding rates and selectivity and to establish a population dynamics model that will inform future control efforts. In the next two months, the Project Team anticipates completing surveys at two additional depth bands and initiating the deep diving surveys using a

trained technical diving team.

The Team has also been heavily involved in the public education and outreach efforts of the Bermuda Lionfish Taskforce, including local courses to raise awareness of the invasive lionfish issue and training/certification for members of the public to assist in population control efforts (culling). As of early July 2013, a total of 167 individuals were permitted to legally spear lionfish within the waters of the Bermuda Platform. Currently, the Project Team is working with the Department of Fisheries to develop the lionfish trap and sent Team Member Dr. Joanna Pitt to the Joint Nature Conservation Committee (JNCC) meeting in the Cayman Islands to present updates and attempt to achieve consensus on a unified protocol for lionfish population assessment that can be implemented in all overseas territories.

"The creation of unified and cohesive collaborative network of scientist, conservationist, government agencies and environmental enthusiasts, made possible by the Darwin Initiative, has initiated a large scale effort to understand the extent of the lionfish invasion in Bermuda by assessing population distribution and demography across the platform. While complete eradication of the lionfish from the Western Atlantic may not be feasible, we hope that the data obtained from our efforts will greatly improve our ability to manage and control these invasive populations thereby minimizing secondary negative impacts on local and regional ecosystems. "

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Scuba survey work Credit
BIOS

Darwin fellow returns to Madagascar armed with new skills and confidence

Voahirana Randriamamonjy (EIDPS-028)

In late May an eclectic group of Brits, Malaysians, Columbians, Irish and Indians gathered for a barbeque in the garden of cottage in a Welsh mountain village to wish farewell to their new friend (photo 1) the Malagasy Darwin Fellow Voahirana Randriamamonjy after her 10 months study at Bangor University.

Voahirana works for the Malagasy NGO Madagasikara Voakajy (MV), an NGO which grew out of links with UK universities and was funded initially by the Darwin Initiative. As MV developed as an organization we identified a need for increased capacity among our staff; both in science skills (we are an evidence-driven organization) and in English (to spread the load of writing funding applications and reports to UK funders). Voahirana was identified as having the potential to thrive in UK higher education and the character to help her spread what she learnt within our organisation.

As well as improving capacity, MV needs to expand and build on its international funding base. The National Zoo of Wales has recently built a state-of-the-art walk-through lemur enclosure and is keen to support in-situ lemur conservation in Madagascar. By doing an MSc in Conservation and Land Management at Bangor University in north Wales, Voahirana was able to get the training she needed while also building and developing a link between MV and the National Zoo of Wales.

The fellowship was an enormous success.

Voahirana came top of the class in her 6 weeks English language training to prepare her for the MSc. She excelled academically on her masters course (getting one of the best marks for her module on Conservation Biology) and presented her research at an international conference at the University of Cambridge. Building links with the national Zoo of Wales was also a real success. Voahirana co-organised a fund-raising evening at the zoo. One hundred and twenty people enjoyed Malagasy food, music and dancing and a speech from Voahirana about Madagasikara Voakajy's work in Madagascar inspired many to make generous donations. The event raised £1500 and attracted matched funding from the Size of Wales.

Voahirana will apply what she has learnt while doing field work for her MSc dissertation on whether introducing small animal husbandry will reduce illegal bushmeat hunting in Madagascar and in her future working for MV. This scholarship has provided enormous opportunities for which both Voahirana, and all of us at MV, are very grateful to the Darwin fellowship programme. Reflecting on her time in the UK Voahirana says "The Darwin fellowship was a great opportunity for me to benefit a high-level training and research instruction which is not available on Malagasy postgraduate courses. This fellowship improved also my capacity in research design and writing academic quality English. Now, I am delighted to share my new skills with my colleagues to strengthen our organisation."

Please see here for a video of Voahirana talking about the fund-raising event at the National Zoo of Wales. http://www.youtube.com/watch?v=qRF8J_-9DQE

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Staff and students from Bangor University wishing Voahirana goodbye on her last night in Bangor (Voahirana is standing up centre front). Credit Dom Wodehouse



Okapi captured by camera trap during ZSL-ICCN surveys in the Watalinga forest of Virunga National Park
Credit ZSL

Using okapi as a flagship to conserve DRC's forests (18-014)

The okapi, a close relative of the giraffe, is endemic to the tropical forests of central and north-eastern Democratic Republic of Congo (DRC). The species is a national icon, but as a result of its elusive nature and the challenges of fieldwork in DRC, it remains poorly known and has received little conservation attention. The plight of the okapi reflects the state of conservation in DRC more widely. Following decades of civil conflict and under-resourcing, capacity to manage and protect the forests okapi inhabit has been substantially reduced, with increasing human population densities and poverty, compounded by resettlement of displaced peoples and movement of rebels, exerting immense pressure on forest resources through deforestation, forest degradation and hunting.

In the face of these challenges, with the support of the Darwin Initiative, in 2010 the Zoological Society of London (ZSL), in collaboration with the Institut Congolaise pour la Conservation de la Nature (ICCN) and partners across the okapi range, launched a major collaborative project to conserve okapi and the biodiverse forests it inhabits. After a promising start collaborating

on a major inventory of the Réserve de Faune à Okapi (RFO) and other field surveys, much of our subsequent planned fieldwork suffered from a number of setbacks. This included a savage attack by an armed group of poachers and illegal miners on the headquarters of RFO in June 2012, where the ZSL project team were in the course of setting up a long-term study to compare okapi monitoring methods. Seven people and all 14 of the captive okapi housed at the headquarters were killed, equipment was looted and infrastructure destroyed. This and the deteriorating security situation further east due to the advances of the M23 rebel group unfortunately led us to evacuate our project coordinator from DRC in August 2012.

The abandonment of fieldwork did however mean that we were subsequently able to focus on a number of other key aspects of the project. Following the collation and collection of historic and current okapi survey data, alongside genetic analysis through an associated PhD project through ZSL's Institute of Zoology and Cardiff University, an okapi status review was written, detailing the biology, ecology, historic and current distribution, threats, relevant research and current conservation efforts related to okapi across its range. In March 2013, a new IUCN SSC Giraffe and Okapi Specialist Group (GOSG) was formed, with project leader Dr Noëlle Kümpel as co-chair and ZSL as institutional host for okapi.

In May 2013, a multi-stakeholder workshop to develop the first-ever species-wide conservation strategy for the okapi was held in Kisangani, in the centre of the okapi's range. The workshop was hosted by the Governor of DRC's Orientale Province and organised by ZSL and the GOSG in partnership with ICCN. Around 40 government representatives (including site directors and key rangers from every protected area in the range), community chiefs, NGO workers and scientists from across the range attended this collaborative, participatory workshop, some journeying by river or road for up to three days each way. The continued buy-in of all these stakeholders will be critical in ensuring implementation of the strategy.

Workshop participants first reviewed and updated the okapi status review prepared by ZSL, and then agreed a vision, goal, objectives and activities necessary to ensure the long-term survival of the species. The workshop highlighted that the okapi is faring worse than

previously thought, being threatened throughout its range by the presence of dangerous rebels, elephant poachers and illegal miners. This information was used to conduct a reassessment of the species for the IUCN Red List of Threatened Species, and the okapi's new threatened status will be announced soon.

Next steps for the project include a number of associated outputs, such as the establishment of a centralised okapi database, an awareness-raising event at ZSL London Zoo to raise the profile of okapi and the threats it faces, and the drafting of a paper evaluating previous okapi population surveys with a view to making recommendations for monitoring. The okapi conservation strategy is being finalised and prepared for publication and the GOSG will play a vital role in supporting ICCN and partners to raise awareness and funds to implement this strategy and halt the decline of this unique, evolutionary distinct, flagship species.

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Strengthening the World's Largest Marine Protected Area, Chagos Archipelago (19-027)

The two outstanding achievements of the project this year have been the Chagos Environment Outreach Programme and the Chagos Scientific Expedition 2013.

The aim of the Outreach Programme is to increase environmental awareness and capacity within all Chagossian communities and to contribute practically to the conservation of the natural environment of the Chagos Archipelago. The Outreach Team based at the Zoological Society of London (ZSL), planned educational family fun days in London Zoo and Manchester Museum to engage the communities, and a further 9 week, 3 module environmental training course for those wanting greater involvement, covering marine ecosystems, terrestrial ecosystems and communication skills. 600 Chagossians attended the family events, and 12 Chagos Ambassadors graduated from the Environment Training Course. The Ambassadors are being encouraged to apply for Conservation Fellow Bursaries to fund further training, and Yannick

Mandarin joined the 2013 scientific expedition to undertake island surveys.

The first Darwin scientific expedition was organised by the Universities of Bangor and Warwick and ZSL, and ran between February and March 2013, with 14 international participants, undertaking 300 person dives, equivalent to 300 hours underwater, at 25 sites across 5 atolls. The MV 'Pacific Marlin' provided a floating platform for the expedition, and a home for the project's new containersied laboratory. Daily excursions were made to the atoll reefs and islands using 5 small boats. The expedition surveyed the bird populations and vegetation on islands in each atoll



Red foot booby on Middle Brother island on the Great Chagos Bank Credit Dr John R Turner

Wherever possible, the scientific teams returned to sites previously surveyed to ensure continuity in data sets over time to assess change, and also explored new sites on the atolls. Studies assessed coral settlement and continued seawater temperature monitoring in lagoons and on seaward reefs on each atoll.

Video transects were recorded to assess changes in reef cover and community structure over time. New initiatives established new monitoring methods, or attempted to make comparisons with sites elsewhere. These included deploying a monitoring buoy equipped with baited remote cameras which could film larger fish off the reef front, and impressively stream images back to London Zoo. Coral growth rate measurements were initiated by staining tagged colonies, and the growth of skeleton laid down beyond the stained band will be assessed next year for comparison with other sites. Bite rates of parrotfish were recorded for input into calcium carbonate budget models to assess accretion and erosion. Autonomous Reef Monitoring Structures (ARMS) – essentially standardised habitat units – were fixed onto reefs, for retrieval after a year to assess the biodiversity they harbour and to compare with sites throughout the Indo-Pacific.

Biodiversity is often highest amongst the groups most scientists normally neglect to study, and therefore cryptofauna inhabiting dead coral heads were identified for comparison with degraded reefs elsewhere in the Indian Ocean. Sponges, black corals and macroalgae provide habitat for other species, and a reference collections were established. These studies not only refine our inventories of species, but are also highly likely to identify new species for the region, and are precursors to future investigations of deeper areas of the reefs. Fish DNA was collected to examine patterns of dispersal to compare with similar data from the Indo Pacific and Red Sea to assess connectivity east and west. Further, taxonomic and biogeographic studies such as these are part of a larger research initiative under the Big Ocean Network (the network composed of the 7 largest MPAs in the world, representing over half of all MPA area worldwide). The Shared Research Agenda of the network includes biological and ecological categorisation, and investigations of connectivity. Preparations are already underway for the next expedition which will take place in March 2014.

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Newly discovered large seagrass beds top the rim of the Great Chagos Bank Credit Dr John R Turner

Equitable Access to Pasture Use for Beekeepers in Kyrgyz Republic (19-015)

Kyrgyzstan is a fascinating country influenced by a range of international economic and political interests. Attempts have been made to settle the population, yet traditional nomadic culture persists across the vast expanses of pasture. The expanding human population means that pastures are suffering from over-grazing.

Our Darwin Initiative project in Kyrgyzstan aims

to encourage people who are shepherding to have opportunity to realise the value of beekeeping – as a source of livelihood, and towards ensuring good pollination of the flowering plants in pastures. Malik (inset) first learned to keep bees after he was captured as a Prisoner of War - during the war in Chechnya - where he was sold as a slave to a local beekeeper. Now he continues to practice apiculture and strives to pass on his skills in a more benign way to young locals. However, he believes that many young people do not see beekeeping as a realistic source of income. Instead, many youngsters decide to leave for the cities – without promise of a better

existence when they reach there. Part of our DI Project therefore involves providing beekeeping training to 60 young Kyrgyz herders – giving them opportunity to realise viable and sustainable livelihoods without needing to leave their ancestral homes. We aim also to encourage local pasture users to understand the value of the pollination services that bees provide.

Most beekeepers are of Russian ethnicity, for example, Andrei moves his hives on the back of an HGV to access different pastures as the flowering season rolls up the Kyrgyz hills. Beekeeping is profitable for him - his daughter has recently returned to work with him following her graduation from University in Germany where she trained in Apiculture – quite a difference from Malik’s experience! Nevertheless, Andrei complains of lack of support from the government that has failed to introduce a Law on Beekeeping, first drafted in 1989. This means that non-local beekeepers such as Andrei have to pay for access to local pastures because of an unclear legal framework for their right to access. We are working on changing this, by lobbying for the Law on Beekeeping to be introduced, and to incorporate a freedom of access clause so that all beekeepers –local and non-local – are able to access pastures so that they can continue their apiculture.



Malik and his wife earn a livelihood from beekeeping and want others to do so too. Credit Bees for Development

As the second year of our Darwin Project begins, it is starting to impact upon people’s lives – ensuring that they have the tools, desire and necessary legal framework to achieve a sustainable, ecologically diverse livelihood. For more information, please email info@beesfordevelopment.org or follow us @ [BeesforDev](#)

Promoting cultural heritage, forest conservation and poverty alleviation through bee keeping in Uganda (19-019)

Honey collecting was a major part of the lives of the indigenous Batwa of Western Uganda as it was used for food and medicinal purposes and also as bride price among these hunter gatherer communities. The process of collecting the honey was elaborate; involving skillful tracking of both common and stingless bees to their locations in trees and underground respectively and yielded a rewarding harvest of the sweet, dripping delicacy, and pride for the collector. However, following the gazettment of forest lands into protected areas in the early 1990s, the Batwa lost access to the places they once called home and with them, this timeless

tradition.

But thanks to a Darwin Initiative grant to Fauna & Flora International, this once cherished tradition is being revived and is expected to yield more than just honey. As part of the project to integrate the cultural values of the Batwa into the management of Bwindi, Mgahinga and Semliki National parks, park management and the Batwa have engaged in negotiations to agree on access to the forests’ cultural resources and sites. Consequently, the Batwa of Semliki have been supported to start an apiary project building on their ancient knowledge and familiarity with bees and honey that will provide the Batwa with an opportunity to reconnect with the forests, access a food and medicinal resource that they cherished while at the same time providing a boost to the dire Batwa household income levels. The project will also provide an opportunity for the Batwa

to showcase their ancient honey collecting knowledge and skills on a tailor made Batwa forest trail experience that will be used to pass on knowledge and skills to the younger generations but also as a tourism activity.

The project has fostered closer collaboration between the Batwa and the park management. The cultural values approach has further improved relations especially with the Batwa who were constrained in benefiting from the park's resource access policy because they feel marginalized among other tribes of the community. The negotiation process and outcomes has enabled the Batwa to feel like equal stakeholders in the management and wellbeing of the park and its resources. The park management is more receptive to the cultural values, beliefs and practices of the Batwa, following a series of training sessions on cultural values and conservation facilitated by Fauna & Flora International staff. This has been evidenced by the collaboration between the park management and the Batwa, working jointly to implement the apiary project, under the guidance of technical personnel.

The adoption and implementation of the cultural values and conservation approach has also improved the management effectiveness of the 220sq. meters of the moist semi-deciduous forest, mostly ironwood (*Cyanometra alexandri*) dominant park, also one of the richest areas for birds in Africa including some of the continent's most spectacular and sought-after birds such as; Congo Serpent Eagle, Long-tailed Hawk,

Black-wattled Hornbill and Lyre-tailed Honey guide.

The honey has not been collected yet, but with various training sessions in modern bee keeping conducted and the hives already set in place, the Batwa can confidently tell their



Hands on training Credit Lavynah Mbambu/UWA-Semliki National Park

children who never experienced forest life, what it feels like to hold a dripping honey comb, as they will soon be able to have the same experience themselves. The improved relations resulting from this collaboration mean that Park management can dedicate their resources, both human and financial, away from law enforcement to other aspects of managing the park, assured that their erstwhile nemeses are looking out for the good of the park, the source of their livelihood and home of their cultural heritage.

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Healthy seagrasses on TCI support an abundance of fish Credit Dr. R. Unsworth



Biodiversity and Food Security: Developing a Collaborative Policy for Seagrass Management in the Turks and Caicos Islands (TCI) (EIDCF-010)

Seagrasses are flowering plants that form meadows in shallow marine and coastal environments. They are key components of coastal and marine systems, providing food and shelter for charismatic marine animals such as endangered Green Turtles and Seahorses, but also play a central role in supporting people. The lush vegetation provides the food, shelter and water quality required by many juvenile fish – and therefore, grasses contribute to the natural replenishment of fish stocks on which often marginalised human communities rely for their livelihood. In this way, seagrasses are an example of how social and ecological systems work together in producing and sustaining the ever changing nexus of the 'human environment'. Despite their importance however, seagrasses are currently being lost globally at a rate of up to two football fields per hour. Losses result from increased nutrient run-off, sedimentation, damage from boats, pesticide leaching and unsympathetic fishing practices – such as the use of bleach to drive out fish. Unfortunately, unlike coral reefs, the plight of seagrasses has so far only received minimal attention.

In response to the threats to seagrasses, an interdisciplinary team from Cardiff and Swansea Universities has begun working with local state and non-government actors in the Turks and Caicos Islands (TCI) to promote more sustainable management. With initial support from Darwin Challenge Fund (August 2012-13) the co-production of knowledge has illustrated the high dependence of local fisheries upon seagrass. Preliminary surveys revealed that some 56 fish species rely on the habitat. Of particular importance are TCI's iconic Conch and Lobster populations which are a mainstay of local fisheries—supplying export markets as

well as domestic consumption as part of the islands' cultural heritage and the economically critical tourist industry. With significant unofficial human immigration from Haiti, the importance of fishing as a livelihood is only likely to grow – especially given the islands high existing dependence on imported food. Unfortunately, research also identified that seagrasses on the islands are under serious threat. Interviews and Community Stakeholder Workshops revealed wide ranging concern about seagrass degradation: particularly in respect to the increasing use of bleach by fishers. Targeted assessments of seagrass confirm degradation by poor water quality and the physical impacts of dredging, boat anchoring and coastal (tourist) development. While general marine protection policy in TCI is strong, the system of enforcement is severely stretched – largely as a result of the on-going financial crisis and previous mismanagement of public funds. Perhaps most critically, protection is weakened by limitations of knowledge across a society increasingly fractured on the basis of cultural identity and entitlement politics.

Overall, the work confirmed the significant need to develop seagrass management frameworks. Furthermore, the lens of 'coupled social-ecological systems' emphasises the importance of avoiding a 'silo' approach to environmental protection. Going forward, the team hope to continue building local capacity and facilitating the on-going generation of knowledge necessary to promote sustainable interactions between seagrasses and the surrounding human communities of TCI and the wider Caribbean.



Local stakeholders and environmental officers attend a seagrass workshop on TCI run by the Darwin funded team Credit Susan BakerUnsworth



The iconic scarlet macaw, whose last remaining population in Guatemala resides in the MBR
Credit Chris Packham/WCS Guatemala

Evaluating community-based conservation agreements in Guatemala's Maya Biosphere Reserve (20-008)

The Maya Biosphere Reserve (MBR) spans 19% of the surface area of Guatemala, and is Central America's largest protected area. It lies at the heart of the largest block of tropical forest north of the Amazon basin and is home to a unique assemblage of plants and animals including the iconic jaguar, puma, Baird's tapir, white-lipped peccary, critically endangered Central American river turtles and Guatemala's last wild population of scarlet macaws. The reserve also harbors hundreds of ancient Mayan archaeological sites, including the UNESCO World Heritage Site of Tikal National Park.

The Maya Biosphere Reserve faces numerous anthropogenic threats to its rich natural and cultural heritage; most notably, deforestation and forest fires. Contributing to these threats are weak governance and inadequate conservation budgets for government entities charged with management of the MBR. As the home of approximately 118,000 rural inhabitants, 60% of whom suffer from poverty or extreme poverty, the MBR also embodies the challenge of balancing conservation

and development in Central America's most populous nation.

The Darwin Initiative's recent award to the Wildlife Conservation Society's (WCS) Guatemala Program has provided critical funding for us to evaluate the effectiveness of a novel approach to provide a win-win for both the biodiversity and people in the MBR. This innovative incentives system, known locally as "Conservation Incentives Agreements", was initiated by WCS in partnership with Conservation International and the Guatemalan parks authority, CONAP. Conservation Incentives Agreements are transparent contracts between local communities, government, NGO partners, and donors, in which local communities commit to protecting biodiversity, and in turn, receive much-needed assistance with basic necessities such as access to healthcare or education. The incentives themselves are chosen by local communities, and the contracts are designed and managed with the full participation of local communities and governmental partners.

Starting in March 2013, WCS initiated project activities to implement conservation incentives agreements across four MBR communities, which represent a range of ecological and socioeconomic contexts. These activities will be complemented by research to synthesize experiences and evaluate the direct impact of agreements on biodiversity conservation and

poverty reduction.

By the end of the three-year project period, we hope to be able to disseminate scientifically robust lessons learned and recommendations for best practices in implementing conservation incentive agreements, an approach with the potential to be scaled up and replicated across the Guatemalan Protected Areas System and beyond.

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Woman from Uuxactun sorting xate, a tropical plant that is now harvested sustainably from the MBR for use in the floral industry; Credit Miriam Castillo/WCS

Darwin Initiative to Enhance an Established Marine Protected Area System, Cayman Islands (18-016)

*'Saving our Tomorrow - Today':
Marine environmental protection in the Cayman islands.*

The Cayman Islands are a UK Overseas Territory (UKOT) in the Caribbean, where Bangor Uni, working with the Cayman Department of Environment and The Nature Conservancy USA, have just completed a 3 year Darwin Initiative project to protect 50% of the island's marine environments. This exceeds the 20:20 targets of the 'Caribbean Challenge' in which the Caribbean's most influential political and business leaders have agreed a challenge of 20 by 20: to conserve at least 20% of their marine and coastal environments by 2020. The project embodied the visions of local people to create a system of Marine Protected Areas to protect biodiversity, culture and infrastructure, and support jobs, incomes and economic prosperity and the outcomes have been demonstrated throughout the Caribbean and beyond. Bangor University School of Ocean Sciences and The Nature Conservancy (the leading US conservation organisation working around the world to protect ecologically important lands and waters for nature and people) have assisted the Department of Environment in Cayman by increasing staff capacity, providing training,

and collaborating in research, to transform their marine park system and to potentially triple marine habitat under full protection. The project has secured £1.45m in grants and in-kind funds, and Cayman is seen as a world class leader in marine environmental protection.

The rationale was that Caymanian society will benefit both now and in the future from an enhanced Marine Protected Area (MPA) system, and therefore there would be wide support for its implementation and operation. Understanding and acceptance of management strategies combined with modified behaviour would secure the sustainable use of marine resources for all, providing long term protection of biodiversity, culture, personal property and economic activity. Coral reefs are threatened globally due to overfishing, coastal development, and overheating oceans due to climate change, resulting in many of them turning into barren tracts of green slime as algae replace coral. 70% of the population in the Caribbean live on coasts, and coral reefs provide resources and coastal protection. Tourism and economic prosperity are strongly linked to healthy marine environments. 25 years ago, Cayman had the foresight to put in place Marine Parks to benefit tourism and protect coral reef habitats and fish, turtle, lobster and conch populations, but the human population has since doubled, coastal development and exploitation have expanded rapidly, and the islands receive 1.4m visitors each year.

The Darwin project engaged society to help



Divers surveying coral recruits Credit Dr John R Turner

design a new Marine Protected Area system to address the challenges of Today and to protect Cayman's heritage for Tomorrow. The project extensively surveyed the coral reefs of Cayman and documented change in coral health and fish abundance, size and diversity, demonstrating that MPAs confer resilience, protect biodiversity, and overspill new fish into local fishable areas. 964 stakeholders were interviewed, and 52 public meetings and focus groups were held. Awareness was raised by extensive media coverage (41 TV items, including 22 'Environmental Break' documentaries, 9 radio programmes and phone-in shows, 49 press items, 42 events and social media outputs, and 2 composed radio jingles featuring marine cultural heritage)

to engage and capture society's vision of the marine environment throughout the islands. The new Marine Protected Area system was submitted to the newly elected Government earlier this summer, and will if accepted protect 50% of the marine environment. The project has been showcased within the region in Florida, Colombia, Costa Rica and Mexico; at government level in London; at international conferences in USA, UK and Australia. A Post-project is currently introducing novel techniques for public policing utilising a phone 'app', and increased enforcement operation management via i-pads.

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Dahari: A new local NGO launched to build on the work of Bristol Conservation and Science Foundation's Darwin project in the Comoro Islands (17-011)

The Darwin Initiative funded project "A participatory conservation programme for the Comoro Islands" came to a close at the end of 2012, but the launch of a new NGO for environmental protection and sustainable development in the Comoros will ensure the long-term impact of the work.

The Union of Comoros is one of the 50

least developed countries of the world and at least 46% of the population lives on less than \$1.25 per day, the international standard for measuring poverty. While economic development has stagnated since decolonisation in 1975, environmental degradation has progressed at an alarming rate. Over the last decade the islands have experienced the highest annual rate of deforestation in the world, with 9% of their forests disappearing each year according to the FAO. This threatens not just endemic biodiversity, of which the Livingstone's fruit bat and the Anjouan scops owl are flagship species, but is also causing grave problems for the human population. On Anjouan (one of the three islands in the Union of the Comoros), deforestation has led to the loss of more than thirty permanent rivers over the past 50

a technician explaining the new agricultural innovations introduced to the Comoros by the project to the authorities and media at the launch of the NGO Credit ECDD

years, as well as severe decreases in soil fertility. Population density on the island is more than 440 people per km² and continues to grow. More than 80% of the population depends directly on farming, and today most of the land is already under cultivation.

The Darwin Initiative project led by Bristol Conservation & Science Foundation in partnership with Durrell Wildlife Conservation Trust aimed to integrate sustainable agricultural development and improved livelihoods with natural resource protection at the landscape level. Over the last four years the project has supported over 1,800 farmers to improve their income from agriculture, over 8,000 people now have improved access to water through improvements to infrastructure, and five village natural resource management committees have been supported to implement micro-projects and perform landscape management planning to include protection of key forest areas and biodiversity hotspots. As well as these direct impacts, the project has also carried out vital research to inform future conservation efforts in the islands through producing the first high-resolution land cover maps and species distribution models for endangered fauna. For more information see www.ecddcomoros.org.

Historically, sustainable development and conservation efforts in the Comoros have been hampered by a lack of effective NGOs in the sector. With the aim of securing the long-term impact of the intervention, a key outcome of the Darwin project was the creation of a new local NGO to lead on environmental management, biodiversity protection and rural development. The first general assembly of the NGO was held at the start of 2013, with 17 founding members coming from the Darwin-funded project team and key figures from the government and civil society. Representatives of the President of the Comoros and the Governor of Anjouan spoke at the launch event in June to express their gratitude for the efforts of the ECDD project and show their support for the new NGO. The event achieved wide coverage in the Comorian press and on national television and radio.



The new NGO “Dahari”, meaning sustainable or long-lasting, will continue the work of the Darwin project, whilst also developing new initiatives to link sustainable development to biodiversity conservation, such as ecotourism and the sale of improved seeds and crop varieties. A key focus will also be the capacity building of future leaders within the NGO, and with this in mind we are delighted that Misbahou Mohamed, the assistant Coordinator for the project, was awarded a Darwin Fellowship for further training and career development in the UK and Madagascar during 2013 and 2014.

During the next phase of the activities led by the local NGO, a key objective will be to put in place direct habitat and biodiversity conservation measures. Where natural resource protection such as critical watersheds overlap with priority areas for conservation of species, then the benefits for all are clearly demonstrated. Where they don't, then establishing a 'value for biodiversity conservation' is more challenging, and we will have to explore other alternatives such as payment for ecological services. We are therefore pleased to announce that the Technical Director for the new NGO and ex-Coordinator of the ECDD project, Hugh Doulton, was also awarded a fellowship by Kinship Conservation Fellows to investigate the potential for applying market-based conservation solutions in the Comoros.

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Divers returning from a survey Credit Dr Ken Collins

Galapagos Marine Invasive Species: Prevention, Detection and Management (19-009)

Prof Terry Dawson, Dundee; Jenny Mallinson and I (Dr Ken Collins), Southampton, visited Galapagos as planned during February to join the Charles Darwin research station marine team to undertake underwater monitoring in harbours and around some of the islands. The original DI funded Galapagos Reserve management Plan (1997-2000) established an extensive monitoring programme which is still running over 12 years later and has enabled this project to hit the ground running with a comprehensive knowledge base of what species are established and what are more recent changes and introductions.

Terry brought out the official papers to finally enrol Inti Keith in her PhD. We are very fortunate to have recruited Inti Keith as the PhD student fully linked to this project. She is an Ecuadorian who has been working in the Galapagos for the past decade. Travelling around the Galapagos archipelago with her has made us aware of how widely she is known and respected. The relatively modest project investment in her PhD will pay enormous dividends in the future.

Survey diving might look idyllic from the photos, but cold currents converge on Galapagos and deeper down internal waves hit you with a blast

of chilled water. In exposed sites, even deep down, the long Pacific swell can throw you around like a beach ball. It is not all suffering and visits by young, curious sea lions are hugely entertaining, but distracting!

Whilst we are asked to submit more interesting pictures than those of groups, I make no apologies for that of the meeting of our team with the Ecuadorian Navy and Biosecurity officials. For me the most surprising and gratifying aspect of this project has been the wholehearted and enthusiastic adoption by the government agencies. See also: <http://planetearth.nerc.ac.uk/features/story.aspx?id=1>

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Meeting with Ecuadorian Army Credit Jenny Mallinson

The time is now for science and markets to build on social momentum for mangrove restoration in Madagascar

(19-016)

Madagascar has lost an estimated 21% of its mangroves over the last twenty years (1990 - 2010), one of the world's highest rates of mangrove deforestation. Millions of coastal people, who depend on mangrove ecosystems for food, wood and energy, are already experiencing the impacts of this loss in their daily subsistence.

But, the picture is not as stark as it may first seem. Blue Ventures (BV) and partners are working to develop mangrove payments for ecosystem services projects with coastal communities at five sites on the west coast of Madagascar, and our team has witnessed some promising initiatives. The communities we work in, many of which have some of the highest rates of household poverty in the world, are already trying to safeguard their neighboring mangrove forests.

Examples include villages such as Ambondrolava, whose people have been working with BV's partner NGO Honko Mangrove Conservation and Education since 2008 to replant mangroves. Similarly, in the Tsiribihina Delta, a WWF conservation site, many communities have themselves replanted mangroves that had been deforested for cropland. Following awareness-raising campaigns run by our team in in Ambanja, northwest Madagascar, six communities have mobilised themselves to organise reforestation events.

One of the most remarkable examples of community-led reforestation can be found in the village of Antetetzambato. In the early 2000's a deposit of green garnets (a precious stone) was discovered in the mangroves here (Figure on next page), attracting hundreds of migrants from the length and breadth of

Madagascar. Many of them failed to make a living from mining and instead turned to making mangrove charcoal, deforesting large areas. Since May 2013, these heavily degraded areas are now being reforested. Led by charismatic village leader, Mr Jacques, the area was divided into three zones and allocated to two women's associations and a community-wide association, who now regularly replant their areas (Figure below).

The majority of these community reforestation efforts have been small-scale (<5 hectares) and use only one or two of the nine species of mangrove trees found in Madagascar. While the communities' enthusiasm for mangrove restoration is evident, most currently lack the technical capacity and long-term financial incentive to conduct ecologically sound



One of Antetetzambato's women's associations receiving technical guidance from Blue Ventures staff during a reforestation event. Credit: Aude Carro

mangrove reforestation on a meaningful scale.

Building on the communities' enthusiasm, BV is providing the technical guidance and economic incentives necessary for broad-scale, effective restoration. In the southwest, BV staff are studying the feasibility of integrating replantation efforts into a Plan Vivo carbon project. In Ambanja and Tsiribihina, we are carrying out novel blue carbon research to accurately quantify the greenhouse gas emissions reductions achieved by mangrove REDD+ (Reducing Emissions from Deforestation and Forest Degradation plus other measures to conserve, restore, and enhance carbon stocks), so providing a basis for climate change finance to support the local

peoples' restoration and conservation efforts.

The challenge currently lies in developing local knowledge and expertise for mangrove restoration along Madagascar's west coast. By drawing upon expert opinion and lessons from successful reforestation projects in other parts of the world and by implementing robust monitoring systems, BV and its partners are providing the scientific guidance and technical capacity to scale-up community efforts and rebuild functioning mangrove ecosystems in Madagascar.

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The green garnets mine and surrounding deforested mangroves in Antetazambato, North-West Madagascar. Credit: Al Harris

NBSAPs: Mainstreaming biodiversity and development (19-023)

How do dragons fit with mainstreaming biodiversity?

When the team from the environment ministry in Botswana signed up to be part of a project to mainstream biodiversity into development policies, they probably never expected it to involve dragons. But on a hot day in Maun, Botswana, four 'dragons' – in reality, four other project members playing the role of investors – listened to a Botswana representative pitching her business case in an exercise based on the TV programme Dragons' Den.

The brave representative was Dineo Gaborekwe, one of 37 participants in the three-day workshop in Maun, the first for the NBSAPs 2.0: Mainstreaming Biodiversity and Development project. The second workshop takes place in Uganda in July.

Dineo presented her case confidently: she emphasised the range of her country's biodiversity assets and their sustainability and

gave evidence of the benefits of biodiversity for ordinary people. She listed revenue, jobs and products, showed how biodiversity can reduce risks and costs, and outlined the potential for the tourism sector. She set out how biodiversity helps Botswana's profile regionally and globally, and highlighted the challenge to policy formulation when there is inadequate background finance.

Her investment ask: backing for community projects to realise the potential of natural pharmaceutical and beauty products, and start-up funds for other innovative projects, enabling the team to leverage finance from other investors.

Why do this now?

The 193 countries that are party to the Convention on Biological Diversity (CBD) are currently revising their National Biodiversity Strategies and Action Plans (NBSAPs). Done well, they will help integrate poverty and environment policies, plans and investment and support both development and biodiversity objectives.

The NBSAPs 2.0 Mainstreaming Biodiversity and Development initiative is a three-year

project to support this process in four African countries: Botswana, Namibia, Seychelles and Uganda, with input from independent members of the project's African Leadership Group from Namibia, Liberia, Zambia and Zimbabwe. The project aims to highlight country members' experiences, encourage leadership in biodiversity mainstreaming and influence the new generation of NBSAPs.

The project partners and collaborators are working on five fronts:

1. Strengthening leadership and capacity
2. Showcasing mainstreaming experience and success
3. Identifying levers of influence and entry points for policy change
4. Developing a business case for biodiversity

Mapping St Helena's Marine Biodiversity (19-031)

On the isolated island of St Helena in the South Atlantic the Darwin Marine Biodiversity and Mapping project is now getting into full swing. The past six months have been very busy with much time spent ordering equipment, setting up literature reference collections, searching for historical records of marine collections and familiarisation with St Helena waters (i.e. a good excuse to get out diving). As well as being highly enjoyable these dives have been very productive with every opportunity taken to gather pictures of all the underwater creatures and collect any unusual species. The photos are for production of identification keys for training of local divers for the island wide habitat and species surveys. Collection dives are also underway – hunting under rocks and in crevices for small invertebrates and already several of the animals that have been collected haven't been recorded from St Helena before, and some even appear to be new species. These will now be sent to taxonomic experts for further examination.

Marine Awareness Week was a huge highlight with presentations on marine issues given to all the islands primary and

as a development asset

5. Assessing the opportunities and constraints for mainstreaming biodiversity.

At the Maun workshop the participants not only worked on developing a business case for biodiversity but also on power mapping, monitoring and evaluation and effective communication.

NBSAPs 2.0 Mainstreaming biodiversity and development is implemented by the International Institute for Environment and Development (IIED) and the UNEP World Conservation Monitoring Centre (UNEP-WCMC) in collaboration with the CBD Secretariat, UNEP, UNDP and the Poverty Environment Initiative (PEI).

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secondary school children. There is a huge sense of community on St Helena and this was strongly felt at the litter clean up's held during this week at the wharf steps, the Run and Sandy Bay beach as well as the harbour dive clean up. The local hotel ballroom was transformed into a spectacle of marine activities from posters and displays, a saltwater tank, a touch tank, marine survey game, marine crafts and a marine themed reading corner. The children and adults learned all about the different types of marine creatures found



Children at Marine Awareness Week
Credit Marine Team St Helena Government.

around St Helena from seabirds to cetaceans and from fish to all the different types of marine invertebrates.

The project has also completed 90 survey dives, recording both the abundance and distribution of different fish and invertebrate species found in the inshore waters all around St Helena. Over the forthcoming months information will also be collected on the different marine habitats with the use of side-scan sonar to compliment the dive surveys and gather seabed information over larger areas. Here's hoping the seas remain calm.

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Bornella Sea Slug

Credit Marine Team St Helena Government.



Rising from the ashes: South Asia's vultures show the first signs of recovering after more than a decade of decline

(18-018)

In the early 1990s populations of three vulture species in South Asia were numbered in the tens-of-millions: the most numerous large birds of prey in the world that provided a crucial eco-system service through consuming large numbers of cattle carcasses in this predominantly Hindu region. The introduction of a veterinary pain-killer – diclofenac – in the mid 1990s, which is used to treat Asia's large livestock populations, dramatically altered this system and in just over ten years vulture numbers crashed. Between 1992 and 2007, the Indian population of Oriental white-backed vulture, decreased by more than 99.9%. In a race to prevent their extinction conservation organisations searched for the cause of the

population declines. In 2003, researchers from the Peregrine Fund and Ornithological Society of Pakistan found the cause: diclofenac use in livestock was widespread and vultures died from consuming cattle treated with this drug shortly prior to their death.

From 2001 the Darwin Initiative has supported a large programme of work to understand and implement conservation solutions for the vulture decline in South Asia. The Royal Society for the Protection of Birds, Zoological Society of London and International Centre for Birds of Prey, partnering the Bombay Natural History Society in India and Bird Conservation Nepal, initially established rescue centres in India to treat sick birds, but following the discovery that diclofenac was the cause, these were converted and expanded in to conservation breeding centres to maintain and breed vultures while numbers crashed in the wild. By 2012 three centres in India and one in Nepal held 332 birds with 62 of these bred in captivity.



Vulture family Credit Vibhu Prakash BNHS Vulture conservation breeding centres in India and Nepal have to date bred 62 birds of all three critically endangered vulture species, including this family group of Oriental white-backed vultures at Pinjore, Haryana, India.

In the early 1990s populations of three vulture species were in decline. Having an ark of vultures in captivity was vital, but finding solutions for the problem of diclofenac in the environment was equally important. Following a worldwide call to zoo veterinarians and raptor rehabilitation centres on the treatment of vultures with veterinary drugs the project worked with the Indian Veterinary Research Institute and researchers from South Africa and Namibia in 2005 to establish that another livestock drug – meloxicam – was safe for vultures. As meloxicam was already off patent, South Asia's pharmaceutical industry was able to manufacture this drug for sale in the region. The numbers of companies making meloxicam in India increased from one company prior to the project's meloxicam safety testing to at least 50 brands by 2010. As this safe drug was becoming established, advocacy efforts intensified and the governments of India, Nepal and Pakistan banned the manufacture and importation of veterinary diclofenac in mid 2006, providing the crucial legal basis for eliminating diclofenac.

Assessing Ascension Island's Marine Biodiversity (EIDCF012)

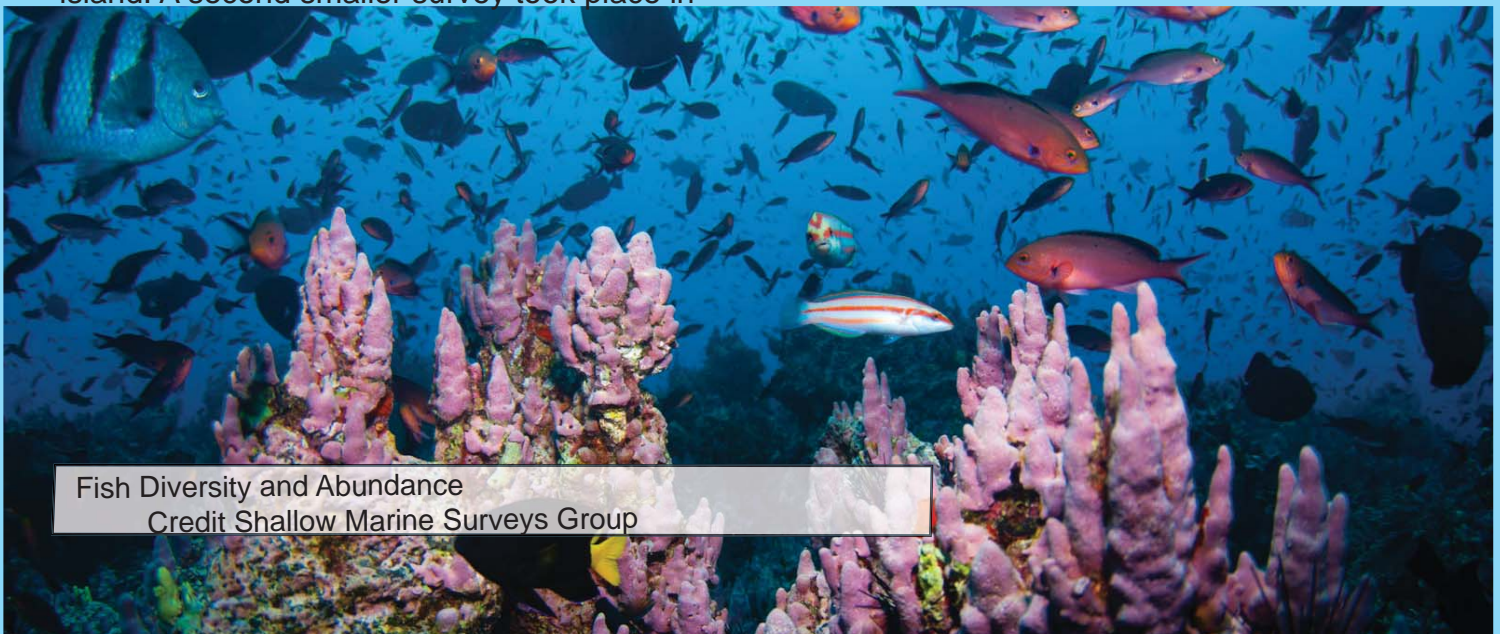
In August, 2012, over twenty scientists and amateur naturalists descended on Ascension Island. Although they were brought to the small outpost in the Atlantic Ocean from many parts of the world they worked together as a team with a single purpose: to spend three weeks measuring, photographing, collecting and cataloguing the wide diversity of marine life found on the variety of habitats fringing the island. A second smaller survey took place in

with diclofenac contamination decreasing from 10-11% prior to the 2006 ban to 2-3% in 2010. More encouraging still, separate surveys of the three critically endangered species of vultures in India, Nepal and Pakistan have shown that after a decade of steep decline, vulture numbers have stabilised, albeit at extremely low levels, and may even have begun to increase.

Much remains to be done before vulture numbers are secure. The potential for another untested veterinary drug to be as toxic as diclofenac remains a constant threat. Small numbers of vultures remain across the region and the Darwin Initiative is supporting local conservationists to create 'Vulture Safe Zones' where the elimination of diclofenac and protection of nesting colonies provides a safe area for the birds. As the effectiveness of these areas increases and as diclofenac and other threats are eliminated, these areas are likely to be key sites for releasing young vultures from the breeding centres – a full circle in the project's progress and another key step for restoring vulture populations across the region.

May 2013 with a smaller contingent of twelve scientists mainly from the Falkland Islands.

This remarkable and ambitious international effort was fully supported by the Ascension Island Government with members of the Ascension Island Conservation Office taking part in the survey. The expedition logistics benefited greatly with assistance from British Forces South Atlantic Islands who also contributed divers to the effort. The Ascension Island Dive Club also provided divers and invaluable local knowledge to assist the team.



Fish Diversity and Abundance
Credit Shallow Marine Surveys Group

The effort was coordinated by the Falkland Islands based Shallow Marine Surveys Group (SMSG), a community based non-profit organisation founded in 2006 to promote marine research in the South Atlantic and its partner, the newly formed South Atlantic Environmental Research Institute (SAERI). SMSG has had great success to date with a number of surveys around the Falkland Islands resulting in new species and numerous scientific publications. Our most recent expedition to the islands of South Georgia was also a great success with significant international participation.

We adapted successful protocols from our previous work, (quantitative photo-quadrats, collections, macro-photography) and employed established methods (belt transects, fish counts). Our experts identified all georeferenced samples taken, to the lowest taxonomic level, during the surveys and these are being used to generate habitat classification schemes. Some species required specialist equipment and expertise to identify and these were collected and sent to experts in those fields. One of the primary objectives was to assess the community structure and abundance of fish fauna over different habitats around the Island using underwater visual census. This methodology utilised three divers, two for counting fish and the other to photograph

0.25m² quadrats in order to determine the density and % area cover of small vagile and sessile invertebrates.

The surveys have resulted in a much needed and improved understanding of the near shore environment around Ascension with highlights including many new species records and potentially new species leading to a better understanding of the biogeography of the Island. As well as reports to Darwin Initiative and Ascension Island Government (AIG), the team have organised a special issue in a scientific journal which will provide a comprehensive record of the work conducted. This work will feed into another Darwin Project being conducted on Ascension 'Implementing a Darwin Initiative Biodiversity Action Plan for Ascension Island'.

In partnership with AIG, the group will be applying for a full Darwin PLUS Grant that will fill temporal, spatial and bathymetric marine biodiversity gaps. It will also examine near shore and offshore fisheries on the Island to inform a system of marine spatial planning and provide a strategy for sustainable fisheries management.

We would like to thank AIG, AIG's Conservation Centre, Colin Wells and Ascension Island Dive club for their invaluable continued support.



Squirrel Fish
Credit Shallow Marine Surveys Group

The Darwin Initiative aims to promote biodiversity conservation and sustainable use of resources around the world including the UK's Overseas Territories. The Darwin Initiative projects work with local partners to help countries rich in biodiversity but poor in resources to fulfil their commitments under the CBD, CMS and CITES. The initiative is funded and administered by the UK Government's Department for Environment Food and Rural Affairs (Defra). Since 1992, the Darwin Initiative has committed over £97million to over 830 projects in over 155 countries.

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For more information on the Darwin Initiative see <http://darwin.defra.gov.uk>

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