

# August 2014 Newsletter: UK Overseas Territories



The Darwin Initiative supports developing countries to conserve biodiversity and reduce poverty. The Darwin Initiative (funded by DEFRA, DFID and FCO), provides grants for projects working in developing countries and UK Overseas Territories (OTs).

**Projects support:**

- the Convention on Biological Diversity (CBD)
- the Nagoya Protocol on Access and Benefit-Sharing (ABS)
- the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA)
- the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)

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# A word from the Darwin Initiative

## UKOTs Edition of the newsletter

We asked for articles to focus on islands since this year is the International Year of Small Island Developing States. With the Convention on Biological Diversity's COP 12 coming up in the Republic of Korea in October we wanted to be able to showcase the excellent work being undertaken with Darwin funding in small island states.

Due to the excellent response for articles we've split our usual newsletter into 2 – a UK Overseas Territories edition and the rest of the world in a separate edition. We hope you find this useful for sharing stories of work in the UKOTs with interested colleagues.

## Darwin Plus

All funding for the UKOTs is now channelled through the Darwin Plus fund. We closed to new applications on 4th August and yet again we've received a host of excellent applications. Our Committee is now hard at work reviewing

these applications and will have the hard job of recommending who gets funding. As you can see from the articles in this edition of the newsletter they will have impressive footsteps to follow.

Working in the UKOTs is never easy with low populations, limited capacity (both financial and human resources) to undertake work and remote locations making work costly and practically challenging. However what these articles highlight is the enthusiasm for nature and biodiversity that is prevalent throughout the UKOTs. It's this enthusiasm that ensures many of these ventures (many of whom rely heavily on volunteers) have long-lasting impact.

Look out for a publication coming soon from the Darwin Initiative that focuses on the work that has been carried out on islands which will no doubt feature heavily the UK Overseas Territories.

For more information on Darwin Plus funding please [click here](#).



Silver shark at Egmont atoll.  
Credit J Turner

## Newsletter contacts

### **The Darwin Initiative Secretariat (Defra)**

To contact us:

The Darwin Secretariat is based in Defra and includes Clare Hamilton, Sally Cunningham and Huw Joynson.

If you have any general queries about how the Darwin Initiative operates please e-mail us at [darwin@defra.gsi.gov.uk](mailto:darwin@defra.gsi.gov.uk)

For any queries on project applications or existing projects please contact our Darwin Administrators (LTS International) at

[darwin-applications@ltsi.co.uk](mailto:darwin-applications@ltsi.co.uk) or [darwin-projects@ltsi.co.uk](mailto:darwin-projects@ltsi.co.uk)

This newsletter is produced quarterly. To include an article on your project please contact us

[Darwin-Newsletter@ltsi.co.uk](mailto:Darwin-Newsletter@ltsi.co.uk)

### **Publicity and referencing Darwin and Defra**

We remind projects that if they are publicising their work then it is important that they make every effort to mention Darwin funding. This is important as it helps us to ensure the Darwin Initiative retains a high profile and helps us to secure continued Government funding.



# The Darwin Expert Committee - An insider's perspective

Government Committees can have a rather stuffy image - formal, bowler hats, out of touch with the real world. However, that doesn't mean that they are all the same and it's good to have the chance now to tell you a bit about one that isn't like that at all.

Perhaps though I should begin by explaining how I came to be on the Committee myself. As head of the Darwin secretariat in Defra for six years until 2012, I advised Ministers on policy and finance issues relating to the Darwin Initiative, and also worked closely with the Darwin Expert Committee (DEC) Chairman to ensure that the Committee were aware of Ministerial priorities.

When I retired I was genuinely keen to play much more golf (which I have), and maybe learn to ride a unicycle (which I haven't yet), but I also thought that of all the things I'd done in Government Darwin had probably been the most enjoyable and the most worthwhile. So I applied and duly became one of the external Committee members.

There are currently 18 on the Committee. Appointments are for three years, and are often renewed for a further three but seldom beyond that - in order to keep bringing on fresh talent and skills.

It's a prestigious committee. Although it's unpaid, and the workload is substantial, there has never been any problem in securing high quality applicants.

The Committee doesn't have any role in terms of policy development. Its job is simply to assess the applications that are made each year. It is for Ministers to set the priorities for each round, and then for Defra to issue the call for applications. Only then do the Committee get involved.

It's a tough job. Funds are limited, and it can be very hard to judge whether to fund a plant project in Kenya rather than a wetlands project in Bangladesh. But however tempted we might be to fund something a bit different, we have to make sure that the ultimate decision is based solely on the quality of the applications before us.

So that's who we are and what we do. Why do we do it? That's easy - because we all strongly believe that this is one of the best, most effective and valuable of all Government programmes.

For evidence, look no further than these Darwin newsletters, which always have some fantastic examples of the wonderful work that's being done. No wonder that successive Ministers from different parties have described it as '*the jewel in the Department's crown*'.

Martin Brasher, Darwin Expert Committee Member

# *Overseas Territories Project News*



Displaying male on BBI Credit: S Weber

Species of *Felimida* nudibranch – still to be described Credit EMD



## Protecting St Helena Island's marine biodiversity

As you submerge into the ocean around St Helena a new world opens up, contrasting to the volcanic island above surface.

At a first glance the habitat is generally large boulders and bedrock with occasional sandy patches, not the same coral reefs of the tropics but unique in their own right. A mini forest of black feather star arms protrudes from most cracks or crevices in the rocks, covered in several different species of seaweed from the bright red *Wranglia* to the soft pink plumes of *Asparagopsis*.

In the shallows, the rocks are covered in the encrusting anemone *Palythoa*, there are patches of star coral with its intricate texture and under ledges you find flower gardens of the endemic orange cup coral. Caves and archways provide opportunity to see spiny lobster, fragile gorgonians, an array of colourful sponges and shoals of glasseye snapper and squirrelfish.

The Darwin-funded marine biodiversity and mapping project has spent two years and many hundreds of dives discovering and documenting the habitats, flora and fauna of the sub-tropical waters of St Helena. In the process of creating a species list for the island, over 120 new records and over 14 new species have been revealed and are currently being described. Side scan and underwater visual surveys have assessed numerous habitat types and combined with abundance surveys this information forms the baseline on which future management decisions will be made.

But knowing what is there is not enough. Policies and legislation need to be in place to protect the virtually pristine marine ecosystem. Diving with devil rays soaring overhead or snorkelling with whalesharks are just some of

the tourism draws to this small isolated island.

As part of this Darwin project the marine section of the St Helena Government have brought into force a policy on interacting with these magnificent creatures, to protect them from harassment thereby allowing people to enjoy seeing these creatures in the wild for years to come.

The project has facilitated high levels of public engagement and outreach, resulting in a dramatically increased number of marine sighting reports, valuable data for informing the policies that have been created. For example the data on cetacean and whale sightings has fed into the policy on underwater blasting, in particular protecting the humpback whales and their calves during their seasonal visits to St Helena. Two pieces of legislation have also been drawn up including regulations for spearfishing and protection of wrecks and marine archaeological heritage ordinance (which also protects the marine life in and near these structures).

But none of the achievements of this Darwin project would have been possible without the enthusiasm and dedication of the local marine section staff. Their willingness to learn and commitment to protecting the marine environment have resulted in the wealth of discoveries and many management strategies being put into place. Working with stakeholders, local businesses, the general public, tourists and the islands children has developed a deep appreciation of St Helena's unique marine life, creating custodians to protect it long into the future.

**For more information [click here](#) or contact Tony Weighell [tony.weighell@jncc.gov.uk](mailto:tony.weighell@jncc.gov.uk)**



REU student selects nursery-reared staghorn corals to be outplanted to two sites as part of her field experiment. Credit K Peach

## Coral nursery project in Little Cayman: enhancing resilience and natural capacity of coral reefs in the UKOTs

Staghorn coral populations have been devastated over recent decades as a result of disease, bleaching, and hurricane damage. Central Caribbean Marine Institute (CCMI) is working with the Cayman Islands Department of Environment to enhance local populations of the critically endangered staghorn coral (*Acropora cervicornis*). On the remote island of Little Cayman, a coral nursery programme is propagating colony fragments, which will be transplanted back to the local reefs.

In addition to directly increasing the local abundance of staghorn coral on Little Cayman's reefs, the nursery also provides an opportunity to research methods for improving existing staghorn restoration strategies and developing new conservation approaches. Three such projects are currently underway at CCMI's Little Cayman Research Centre in conjunction with the National Science Foundation's Research Experiences for Undergraduates programme.

The first project investigates the role of site selection on growth and survivorship of planted nursery-reared staghorn corals. Scientists have planted approximately 120 colonies

to two geographically sites over the past two years, with varying levels of success. CCMI's research team is currently focused on measuring environmental factors such as surface condition, sedimentation rate, temperature, and light, to determine which site-related factors have the most profound effects on planting success. Two other laboratory-based experiments are looking at the impacts of climate change on staghorn corals. Environmental conditions and predicted variations due to climate change will be used to design new strategies for planting nursery grown coral. CCMI's goal is to help staghorn coral flourish in a constantly changing coral reef habitat.

**For more information [click here](#) or contact Carrie Manfrino [manfrino@reefresearch.org](mailto:manfrino@reefresearch.org)**





# Multi-disciplinary research and international collaboration to rescue the Caicos pine forests

In May 2014 a team of seven researchers from the Royal Botanic Gardens Kew (Kew) travelled to the Turks and Caicos Islands (TCI) for the first of several field trips for the project '*Caicos pine forests: mitigation for climate change and invasive species*'. The project is working with local partner, the Department of Environment & Maritime Affairs (DEMA).

The pine forests in TCI are under severe threat of disappearing forever if the keystone species the Caicos pine goes locally extinct. This is the only native pine tree in the islands, and without any pines there will be no pine forest ecosystem and many other species of fauna and flora will be negatively affected. In the past decade, a severe infestation by the non-native and pine-specific pine tortoise scale insect (*Toumeyella parvicornis*) has killed the majority of pines in TCI, devastating the local pineyards. High level of infestation in all pine populations, low number of individual pines and threats from sea-level rise in these low-lying islands, means there is need for urgent action if the Caicos pine is to survive into the future.

Essential work to monitor the TCI pineyards and establish ex-situ pine collections has been on-going through a long-term collaboration between Kew and TCI partners. However, further scientific knowledge about the species and its habitat was needed to inform future recovery plans. This is where the new Darwin Plus project comes into action.

Findings on mycorrhizal associations (where a fungus colonises the roots of the host plant), water relations, chemical resistance to pests, population genetics, propagation and cultivation, seed storage behaviour, population viability, and effects of storm surges and sea-level rise will be combined and applied to create several protocols to guide the future survival and restoration of the Caicos pine forests.

The project got off to a good start with three weeks of intensive and productive fieldwork. Positive outcomes include:

- Large numbers of collections across the islands: 261 DNA samples of pines and 19 other species, 166 samples of fungus colonised roots, 31 sticky traps with insects, 32 samples of pine volatiles (organic compounds emitted into the air) and 35 samples of dried pine needles.
- Approximately 1000 pine seeds were sown in the TCI project nursery and 462 records for pine trees in the existing permanent monitoring plots were updated.
- Initial data for population viability and water stress studies were gathered and a seed viability experiment was laid out.
- Healthy, pest resistant pine trees and beneficial insects preying on the scale insect (e.g. ladybirds and parasitic wasps) were observed and recorded. Insect samples, including some new insects found on pine trees were sent to the Food and Environment Research Agency in the UK for identification.
- Engagement with the local community during the International Day for Biological Diversity activities on North Caicos. Practical demonstrations of science applied to local plant conservation were given by the team, highlighting the importance of the Caicos pine related to biodiversity and ecosystem services.

The team is looking forward to heading back to TCI for more fieldwork later in the year.

For more information [click here](#) or contact Martin Hamilton [m.hamilton@kew.org](mailto:m.hamilton@kew.org)



## Bermuda Invasive Lionfish Control Initiative

The summer field season is well under way for researchers from the Bermuda Invasive Lionfish Control Initiative.

Scientists from the Bermuda Institute of Ocean Sciences, Bermuda Zoological Society, Ocean Support Foundation, University of Massachusetts at Dartmouth and the Bermuda Government Departments of Environmental Protection and Conservation Services are surveying reefs ranging from 10 – 60m depth for invasive lionfish and analyzing their impact on reef communities. “Shallow” dives involve diving to 10m, 20m and 30m, whilst deeper dives go to 45-60m.

On each survey, lionfish abundance is counted in a 10m x 25m area of the reef, while transect surveys are conducted to assess prey fish diversity and abundance. Surveys on deep reefs follow the same research protocol however due to the depth, the use of technical decompression diving is required.

All lionfish encountered are removed from the reef and back on shore are analyzed and samples taken. We have discovered dense aggregations of lionfish on deep reefs whilst in contrast they have been consistently absent from the 10m sites. Our ability to dive these reefs, to actively remove lionfish, and to study the potential prey fish populations in a poorly studied reef zone is a critical component to understanding the magnitude of their impact and how we can control this invasive population.

Recently, the Bermuda Institute of Ocean Sciences hosted the annual Groundswell Lionfish Tournament, Eat'em to Beat'em. Based on the findings of the Darwin Plus

research project, local lionfish cullers were able to target areas of high abundance, resulting in the highest number of fish removed in the five years that the tournament has been held.

Discussing the success of the tournament, Dr. Goodbody-Gringley stated *“We are thrilled with the turnout for this important event and are excited to be able to encourage the local community to become actively involved with controlling the invasive lionfish population in Bermuda.*

*The success of the tournament truly highlights the growing awareness of the Bermudian community to this critical issue and we hope that through continued outreach events, the findings of our research will ultimately contribute to increased local participation in lionfish extirpation and reef conservation.”*

**For more information [click here](#) or contact Gretchen Goodbody-Gringley**

**[gretchen.goodbody-gringley@bios.edu](mailto:gretchen.goodbody-gringley@bios.edu)**

Golden sail spider (*Argyrodes mellisi*)  
unique to St Helena and only found in  
the Peaks National Park. Credit: R. Key

## Bugs on the Brink– Invertebrate conservation on St Helena

St Helena is home to over 400 unique bugs that are found nowhere else in the world – that is more species than the UK and all of the other UK Overseas Territories put together. Unfortunately many of these species are extremely rare and highly endangered and St Helena's invertebrate conservation team faces the challenging task of bringing these species back from the brink of extinction. Funded by the Darwin Initiative and supported by Buglife in the UK, we are striving to advance invertebrate conservation on one of the most remote islands in the world.

Since February 2013, the St Helena National Trust has been collecting data to create a database of all the islands invertebrate species. As a result we can now map species to show where invertebrate communities can be found, and establish relationships between invertebrate species and the plant communities they inhabit. This will support the development of best practice for rehabilitating the islands invertebrate fauna.

The Nature Conservation Division of St Helena Government is incorporating information from the database into government policies on planning and habitat management of the Nature Conservation Areas on the island. For example, beetle species, representing 6% of all endemic invertebrate species, need decaying wood to survive. The continuation of deadwood habitats, particularly of the islands endemic trees which are also under threat, is crucial to their survival.

The trust has also been promoting the project amongst the schools on the island - inspiring the local community is crucial to our success. Over the last 12 months the trust has worked with over 200 school children, opening up the magical world of bugs and helping them learn about the environment.

Habitat loss and invasive species represent the biggest threat to native and endemic invertebrates. The Eastern Arid Area is home to a large concentration of the islands endemic invertebrate fauna, and has been described as "*an extraordinary hotspot of endemism*". As the flattest area of the island however, it is the most obvious site to build the islands first airport. The St Helena National Trust is using specialist knowledge developed through this project to find ways of mitigating against loss of endemic invertebrate species. In September the Centre for Ecology and Hydrology will join the project to investigate the role of pollinators in local habitats and to help to develop a holistic approach to ecosystem management.

'Bugs on the Brink' is a partnership between Buglife, Saint Helena National Trust, Saint Helena Government and the Centre for Ecology and Hydrology.

**For more information click here [www.buglife.org.uk/bugs-brink](http://www.buglife.org.uk/bugs-brink) or contact Alice Farr [Alice.Farr@buglife.org.uk](mailto:Alice.Farr@buglife.org.uk)**



David Parker (UKHO) discussing survey plans with BVI Governor Boyd McCleary. Credit David Parker, UKHO

## British Virgin Islands Marine Protected Areas & hydrographic survey capacity building

Anyone spending time at sea, whether for business or for leisure, will be familiar with the charts showing water depths and sailing directions. The United Kingdom Hydrographic Office (UKHO) publishes over 3,500 navigational charts worldwide. These charts are based on best available data, however in some areas the best available data are based on 19th century lead line observations. A lead line is a length of thin rope (with tie marks at intervals to assist with measurement) with a plummet, generally made of lead, at its end. Lead lines were swung or cast to measure water depth.

The “sailing capital of the world”, the British Virgin Islands (BVI), is one of the UK Overseas Territories where charts still rely heavily on lead line observations from mid-19th and early 20th century.

Technology has moved on from using lead lines to observe depths. Sonar systems can map entire swathes of the seabed and produce highly accurate maps which can be trusted by mariners and contribute to saving lives at sea. Whereas in early days these systems were primarily used for military and charting applications, in recent years they have also proven highly valuable to a range of marine science disciplines. In the UK and many other countries around the world, these systems are used to characterise the nature of the seabed and develop habitat maps. These maps can be used for a range of management purposes, from planning, to infrastructure and economic development, as well as the assessment of marine biodiversity and the management of marine protected areas.

This project brings together the Centre for Environment, Fisheries and Aquaculture Science (CEFAS), the United Kingdom Hydrographic Office (UKHO) and National Parks

Trust of the Virgin Islands (NPT). The UKHO are world experts in hydrographic surveys and charting, The project will bring state-of-the-art 3D seabed mapping technology to the BVI to undertake surveys to update the charts around parts of the islands, and provide habitat maps as tools for local managers.

In June 2014 a stakeholder event was held in BVI. Opened by BVI's Deputy Prime Minister and the Minister for Natural Resources & Labour, this high level and broad organisational representation, demonstrates how the data and project will be valuable to a range of local stakeholders. The group agreed to an area of around 27km<sup>2</sup> in the Sir Francis Drake Channel as the focus of survey work. The area covers the region's prime dive location (RMS Rhone Marine Park) and unsurveyed deep waters of the Sir Francis Drake Channel, an important shipping access route to Road Town harbour and spawning and nursery grounds. Our team was also invited to meet the BVI Governor who in recognising the importance of the work to the local area was keen to learn more about the project, and will be following our progress with interest.

As we write the survey is well underway. In the next newsletter we hope to show you the preliminary results from the hydrographic survey, as well as some underwater imagery which will be collected later in August. Whereas most of the shallow waters around the BVI have been visited by divers, the deeper sites beyond the reach of divers may still be home to some undiscovered species which we hope to find using underwater video equipment.

**For more information [click here](#) or contact Koen Vanstaen [Koen.vanstaen@cefas.co.uk](mailto:Koen.vanstaen@cefas.co.uk) or follow us on Twitter [@CefasGovUK](#)**



Lobster Pueruli  
Credit H Latham

## Marine monitoring around the world's most remote inhabited island

The last Darwin Initiative Newsletter saw an update from the Tristan da Cunha Darwin Plus Project detailing the successful completion of a shallow water survey of Gough Island. We have just completed an extended stay on Tristan progressing further work to increase understanding of the shallow marine ecosystem of the Tristan da Cunha archipelago. This includes research on little known juvenile stages of the Tristan rock lobster *Jasus tristani*, investigating linkages in the Tristan food web, and establishing long-term monitoring for sub-tidal and inter-tidal habitats.

One of the first successes was the deployment of collectors on Tristan, Inaccessible and Nightingale islands to trap pueruli (early juvenile stage of lobster development) as they settle out of the plankton. The abundance of any adult lobster population is primarily dependent on the recruitment, survival, and growth of its larval and juvenile stages. Within a couple of months collectors were able to acquire epiphytic (living on the surface of plants) fauna and flora. These collectors are an on-going project and will help to identify seasonality, good years for recruitment, and predicting lobster stocks in future years.

The next step, is to determine interactions and food web linkages. Due to its importance to the island (the rock lobster is the cornerstone of Tristan's economy) establishing the diet preferences of Tristan rock lobster was a key question. Feeding experiments and sampling (as part of a larger suite of Tristan marine species) are providing the opportunity to conduct analysis of carbon

and nitrogen chemical elements as food sources are eaten and assimilated. Comparison of chemical elements of potential predators and prey can indicate important dietary preferences. Around 150 tissue samples now await processing in the UK.

The marine habitats of Tristan da Cunha are unique and particularly vulnerable to climate change, non-native introductions and maritime disasters. To monitor potential changes in marine communities around the islands, various monitoring methods have been developed and trialed. Monitoring sites have been identified and training has been provided to Tristan islanders. It was important that the design of any long-term monitoring programme was easily repeatable by local people allowing it to be continued beyond the end of the funding period. Involvement of Tristanians in the project is paramount and a presentation was given early on in the project to share photos and videos of the marine life of Tristan and Gough, and provide the wider island community with information on the Darwin Project. Tristan divers have participated in the monitoring and puerulus sampling work, and are continuing the monitoring through the southern winter months until the next team of project biologists arrive in September.

**For more information [click here](#) or contact Claire Stringer [clare.stringer@rspb.org.uk](mailto:clare.stringer@rspb.org.uk)**

## Ensuring engagement in Cayman's enhanced marine protected area system

The Cayman Islands are fortunate to have some of the highest marine biodiversity in the Caribbean, benefitting from 27 years of in-situ marine conservation. Despite this, there are significant pressures on the marine environment from coastal development, invasive species, and fisheries and tourism impacts. This Darwin Post Project follows on from the main project "Darwin initiative to enhance an established marine protected area system" that aimed to increase No-take protection from 15% to ~50% of representative reef habitat.

Through detailed field study and extensive public consultations, four key research areas were highlighted as integral to the success of the new marine protected area (MPA) system and are being addressed by the Post Project. This article will focus on one of these key areas: the sustainability of concessionary fishing slots near MPA boundaries through monitoring of the "spill-over" effect.

MPAs are understood to be a key tool in marine conservation management, not only as a safeguard against detrimental anthropogenic activity, but because the increase in species biomass and abundance creates a "spill-over" effect on MPA boundaries that can then be sustainably exploited.

To increase public support and engagement in an enhanced MPA system, a team from Bangor University are working with the Department of Environment in the Cayman Islands gathering valuable baseline data. This includes an underwater visual census of fish biomass and abundance within the proposed MPA boundaries, and into fishable areas outside the MPA boundaries around all three islands. This primary data will form the basis for future long-term monitoring and inform the sustainable use of these concessionary fishing areas.

Preliminary results from the underwater visual census suggest that overall carnivorous fish biomass is highly variable around Grand Cayman most likely owing to the effective protection of the Nassau grouper populations around that island and effective marine park management.

To date 23 sites have been assessed in Little Cayman and 19 in Grand Cayman with more to follow in August. Approximately 36 carnivorous and 19 herbivorous fish species have been observed during the surveys, which corresponds well with previous diversity studies conducted in the Cayman Islands. The team are also conducting interviews with fishers to gather information on their method, catch and valuable socio-economic information.

Understanding the behavioural patterns of local fishers and the factors that drive unsustainable exploitation of marine resources is key to designing a successful MPA system that can benefit all stakeholders.

The final round of consultations for the Cayman Islands enhanced MPA system is scheduled for September of this year. It is expected that data from the overspill study will help in gaining the support of local fishers by demonstrating the benefits of an enhanced MPA system. These concessionary fishable areas will be managed to ensure that MPA overspill is not overexploited, sustainable populations of fish remain to support the incomes of future generations of the poorest fishers who cannot access more distant fishing areas.

**For more information [click here](#) or contact John Turner [j.turner@bangor.ac.uk](mailto:j.turner@bangor.ac.uk)**



Recovering BRUV onto the longboat Pitcairn  
Credit R Irving

## Initial findings of underwater video of reef fishes at Pitcairn

Given their extremely isolated location and difficulties of access, the Pitcairn Islands' marine habitats are one of the UK Overseas Territories least known ecosystems.

Tourism and fisheries currently represent the primary mainstays of the local economy, drawing upon the natural wealth and cultural heritage of the Islands, but to date these have not been fully-realised and scientific evidence for fisheries management remains insufficient for decision-making.

Global fishing pressures on migratory species, especially tuna and billfish, have resulted in commercial fishing fleets increasingly approaching the Pitcairn Government to lease their fishing rights. This project aims to produce a fully-operational fisheries and marine management plan that is ecosystem-based and sustainable, which is crucial to providing a secure future for the economic benefit of the Island community and protection of the unique marine biodiversity of the Pitcairn Islands.

This was to be our first trial of using Baited Remote Underwater Video cameras (BRUVs) at Pitcairn. We had five of the BRUV frames made on the island and we bought out small GoPro video cameras to allow two to be set up on each frame as a stereo pair. This would allow individual fish caught by the cameras to be measured accurately, providing us with an indication of the diversity, abundance and size of the reef fish species around the island. The cameras would primarily capture those species that are attracted by bait, as a metre-long bait arm sticking out in front of the cameras held mashed up pilchards contained in a wire mesh envelope. Pilchards do not occur naturally at Pitcairn, but we were keen to ensure the same bait was used here as had been used at other sites in the world, for


the purposes of comparing our results.

The five frames were arranged on the deck of the longboat in a line, each with a buoy attached by a length of rope. We dropped them at different depths ranging from shallow (12 - 15 m), mid-depth (20 - 25 m) and deeper depth (30 - 35 m). The camera housings are only guaranteed to 40 m depth, so we were wary of dropping them any deeper, even though we knew we were likely to find larger fish at these deeper depths. Each drop had to be at least 300 m away from any other, to avoid influencing the fish population local to each drop site.

Once back on dry land reviewing video footage the first thing to strike us was the clarity of the water: the waters around these islands are known to be some of the clearest in the world, unaffected by coastal pollution and very low in nutrients. The second thing was that, in less than 30 seconds of the frame settling on the seabed, the bait was surrounded by a throng of nanwe (*Kyphosus pacificus*), a sea chubb which is the island's most prolific fish species. Other highlights which we recorded on other drops included octopuses, moray eels, a variety of groupers and the occasional shark.

All of this information will be analysed, interpreted and included in the marine management plan for the Pitcairn Islands. We're looking forward to continuing our work on this beautiful island and would like to thank all of the islanders for their kind hospitality and assistance during our short stay .

**For more information [click here](#) or contact Terry Dawson [t.p.dawson@dundee.ac.uk](mailto:t.p.dawson@dundee.ac.uk)**



Manta rays at Middle  
Island, Diego Garcia  
Credit J Turner

## Darwin Initiative to strengthen the World's largest Marine Protected Area, Chagos Archipelago

In the previous edition of the Darwin Newsletter, we reported on the recent Darwin Science and Conservation Expedition to British Indian Ocean Territory (BIOT) in March–April 2014. Since our return, we have been undertaking preliminary analysis of the data, and can now highlight some of the findings.

Approximately 250 dives were conducted at 29 sites on six atolls to survey species, habitats and communities on the coral reefs, and 15 islands of ecological importance were also surveyed.

Overall most reef sites appeared quite healthy with low disease prevalence. However, five disease types were identified. White syndrome was documented throughout the archipelago, with low overall prevalence, but locally severe at several sites. This disease appeared to target large and older *Acropora*, a stony coral, which is of concern given this group's important reef-building status. These stony coral colonies are now less abundant on most reef terraces throughout the atolls, and at present, we do not know whether they have perished due to old age, bleaching, disease, or storms, or a combination of these factors, or how their resilience has been affected. Dead colonies of *Acropora* are being moved down the reef slopes by storm action, and many juvenile corals that have settled upon them are also being lost.

Coral cover data has been collected at long-term monitoring sites, building on data first collected in 1978 and again in 1996, and then more regularly between 2006 to 2014. Our concerns are that 2014 looks like being a very warm in the Indian Ocean, and we are anticipating further coral bleaching and subsequent mortality this year, potentially on a scale equivalent to 1998. Temperature

loggers are currently recording temperature at two hourly intervals at three depths on each atoll. These loggers are checked and replaced on each expedition to ensure a long term temperature data is collected.

143 species of coral were documented during the 2014 expedition, 32 of which have not previously been reported from Chagos, and 16 of which are outside their known ranges.

Fish abundance was generally higher than observed elsewhere in the Western Indian Ocean (WIO), particularly for herbivores such as parrotfish and surgeon fish, but certain key taxa were absent, and overall biomass was not as high as expected. Total species counts were in the order of 102 per site, compared with 135-150 in Cabo Delgado, Mozambique and Mafia island, Tanzania.

Despite known poaching, reef sharks (especially Silver sharks) were relatively common and seen on every dive, which is now a rare observation in the WIO, and some spectacular manta rays were observed, although not as frequently as in 2006.

These important findings are helping us understand the unexpected wide variability in species populations in British Indian Ocean Territory, and underline the importance of the Chagos Marine Protected Area. The findings will contribute to the Chagos Management Plan, and plans are already underway for a 2015 expedition, planned to coincide with the peak period of seawater warming.

**For more information [click here](#) or contact John Turner [j.turner@bangor.ac.uk](mailto:j.turner@bangor.ac.uk)**