Newsletter

February 2018

St Helena Butterfly Fish, Credit: Marine Section, ENRD, St Helena Government

DARWIN INITIATIVE

The Darwin Initiative supports developing countries to conserve biodiversity and reduce poverty. Funded by the UK Government, the Darwin Initiative 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 Fauna and Flora (CITES)

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Funded by UK Government

DARWIN INITIATIVE

darwininitiative.org.uk

A happy survey team,
Credit: Christina Saylor, Blue Ventures

Contents

Tristan da Cunha, Credit: Antje Steinfurth

Publicity and information about the Darwin Initiative

For more information on the Darwin Initiative please visit **gov.uk/government/groups/the-darwin-initiative**

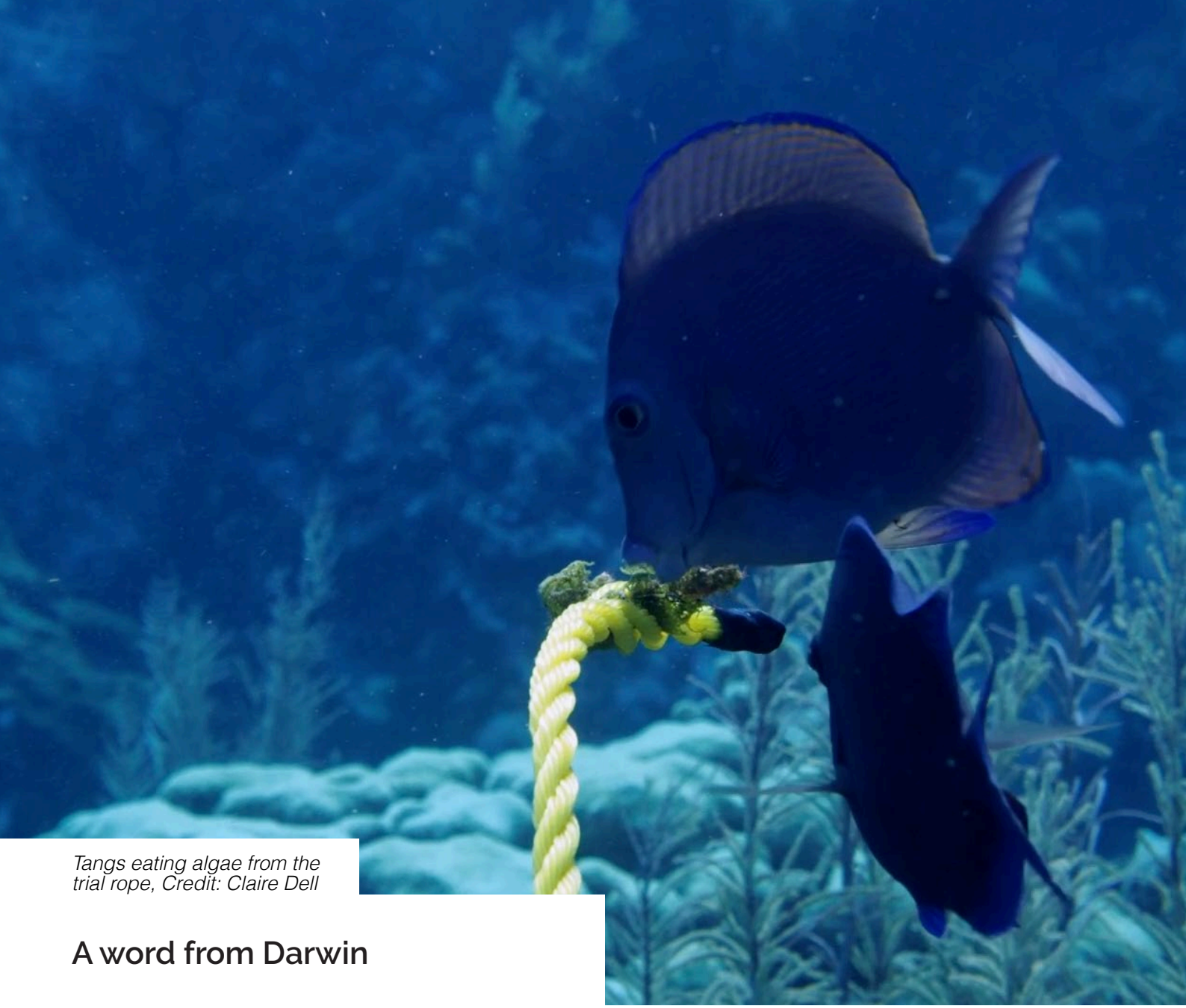
For further details about current and completed Darwin Initiative projects, including their final application forms, please visit **darwininitiative.org.uk**

We also have a blog, that includes news and thoughts on issues being tackled by the Darwin Initiative – both at the project and programme level. You can read it here **darwininitiativeuk.wordpress.com**

We're also keen to share other Darwin project blogs. If you have a blog you'd like to share on our website, please get in touch at **darwin-newsletter@ltsi.co.uk**

Publicity and referencing Darwin Initiative

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



Tangs eating algae from the trial rope, Credit: Claire Dell

A word from Darwin

This edition of the newsletter is themed around Sustainable Development Goal 14 "Conserve and sustainably use the oceans, seas and marine resources for sustainable development".

Oceans cover three quarters of the Earth's surface and support the livelihoods of over three billion people. However, ocean ecosystems are under threat, with as much as 40% the world's oceans negatively impacted by human activities.

Many Darwin Initiative and Darwin Plus projects are working towards the targets of this goal. The articles featured below highlight how some of our projects are working towards:

- Sustainably managing marine and coastal ecosystems
- Increasing the level of protection for ocean habitats
- Improving the sustainability of fisheries and minimising the impacts of overharvesting
- Providing access to markets for small scale fishers
- Increasing scientific knowledge and the capacity for marine research in developing countries

2017 marked the 25th Anniversary of Darwin – and one of our **previous newsletters** featured just a few of the highlights from over the years!

A recent event to celebrate the Anniversary held at the Royal Society in London featured a show reel documenting what the Darwin Initiative has achieved over the last 25 years – find it here: **https://www.youtube.com/user/defrauk**

Cownose rays being caught by nets in Tanjung Luar, Credit: Rifky (Indonesia Nature Films Society)

Sustainably managing shark fishing for livelihoods and food security in Indonesia

Lying at the heart of the Coral Triangle, and spanning more than 6 million km^2 of ocean and 17,000 islands, Indonesia is a global hotspot for marine biodiversity with high levels of shark richness and endemism. It is also the world's largest shark fishing nation, with average annual catch exceeding 100,000 tonnes per year.

Shark fisheries have existed in Indonesia for centuries, providing an important source of livelihoods and food security for coastal communities. Fisheries are often small-scale, mixed-species and difficult to monitor due to their informal nature and widespread distribution throughout the archipelago. A rise in targeted and opportunistic shark fishing has taken place in recent decades in response to growing demand for shark products. High value fins are exported to international markets, while non-fin products including meat and skin are consumed domestically. This million-dollar industry employs thousands of people, from fishers to processors to traders, and holds significant social value as a tradition, culture and 'safety-net' source of animal protein.

Sharks and their cousins are now recognised as one of the world's most threatened vertebrate groups, with public sentiment shifting towards promoting their protection. As a result, Indonesia's shark fisheries are increasingly in the spotlight.

Tanjung Luar, a small village in Lombok, West Nusa Tenggara province, has drawn attention because of its open shark landings, proximity to high-end tourism resorts, and negative portrayal of local fishers in the international media. More than 6,000 individual sharks and rays across 82 different species are landed in Tanjung Luar each year, by a targeted long-line fishing fleet of roughly 50 vessels. Catch is dominated by silky shark (*Carcharhinus falciformis*), dusky shark (*Carcharhinus obscurus*), spinner shark (*Carcharhinus brevipinna*), scalloped hammerheads (*Sphyrna lewini*) and blue sharks (*Prionace glauca*), several of which have recently received increased protection under a range of international conventions, notably the Convention on the International Trade of Endangered Species (CITES) and the Convention on Migratory Species (CMS). High grade shark fins from some of these species can fetch more than USD $100 per kg for the first buyer. This high price, and a lack of other legal, sustainable alternatives, makes implementing shark conservation in Tanjung Luar extremely challenging.

> "A rise in targeted and opportunistic shark fishing has taken place in recent decades in response to growing demand for shark products"

In a lesser known village in Aceh province, at the northern tip of Sumatra, fishermen targeting shrimps and reef-fish accidentally catch juvenile scalloped hammerheads (*Sphyrna lewini*) in gill nets. The juveniles are low value – fetching less than USD $5 per individual for local consumption – but are often taken in high

Colourful boats in Tanjung Luar harbour, Credit: Hollie Booth, WCS

numbers. Local fishers acknowledge that catching juvenile sharks is unsustainable, but have limited options for reducing fishing mortality due to the high death rates of the shark bycatch.

The Wildlife Conservation Society (WCS) Indonesia, with financial support from the Darwin Initiative, is seeking to balance the complex trade-offs between shark conservation and socioeconomics through a nuanced, pragmatic, and ethical approach. We support the government and fishing communities to implement fisheries management and marine protected area interventions at the local level, aiming to improve the status of shark and ray populations while securing the livelihoods of local communities who are highly dependent on marine resources. In Tanjung Luar we are helping to identify and incentivise the adoption of more selective and sustainable fishing practices, while also reducing barriers to more sustainable livelihoods. In Aceh we support the establishment of a local shark sanctuary to protect hammerhead shark nursery grounds, and are working with traditional leaders to manage marine resources. We believe that our site-based efforts, which acknowledge complexity, build mutual understanding, encourage participative decision-making, and incentivise sustainability, will set an example for shark conservation efforts in other parts of Indonesia, and throughout the world.

Article written by members of the WCS Indonesia Programme: Muhammad Ichsan, B. M. Simeon, W. P. Lestari, Efin Muttaqin and Hollie Booth. For more information on project 22-008 click **here** or contact Project Co-Leader Hollie Booth, **hbooth@wcs.org**

Lady with fish in Tanjung Luar, Credit: Hollie Booth, WCS

Brown noddy,
Credit: Samantha Cherrett

Understanding the pelagic ecosystem supporting St Helena's fisheries and marine tourism

St Helena can be described as one of the most remote islands in the world. Located in the central south Atlantic gyre, it is a 47 square mile anomaly in an otherwise far reaching expanse of almost uninterrupted open water.

Islands such as this can act as productivity hotspots by changing the ocean circulation around them, as well as seeding the ocean with nutrients from the land itself. St Helena has long seen the results of this through the presence of globally important megafauna, such as humpback whales, whale sharks and commercially important tuna species. On a smaller scale, St Helena is also home to many endemic marine species hidden amongst its impressively biodiverse inshore waters.

The St Helena marine environment supports commercial and recreational fishing activities, marine wildlife tours, SCUBA diving, snorkelling and pleasure cruises, as well as providing a stopover for passing yachts. Since the successful commencement of weekly flights to St Helena's airport in October 2017, tourism numbers are at an all-time high with associated demands on the marine environment greater than ever; a demand that is only expected to increase.

St Helena has long been committed to protecting its marine environment and, in early 2017, declared its 200 nautical mile maritime zone a category VI Marine Protected Area and developed a Marine Management Plan focused on sustainability and protection. Support from the Darwin Initiative made this possible by funding the initial research into sustainably developing and managing the islands fisheries and marine tourism.

A key-part of ensuring sustainability is to understand the pelagic ecosystem and how seasonal and long-term changes in that system will impact the abundance and distribution of the marine life on which the economy of the island depends. To that end, the Darwin Initiative has provided further funding to support the research needed to answer these questions. This project is investigating the marine ecosystem from the foundations up; investigating how ocean physics drive seasonality, how seasonality influences productivity, what organisms fill the gap between marine plants and large mega fauna and how they interact, both with each other and with their environment.

This project boils down to needing to know why the marine environment is the way it is, why the marine species come here and what might happen if anything changes, be it through climatic change or through direct human interaction.

It's a big task, made all the more challenging by the remote location. Local boat operators do more than drive the scientist to where they need to sample. They use their years of experience to help across all aspects of work, from catching bait fish, like mackerel, to safely navigating and deploying equipment in the notoriously rough waters on the windward side of the island.

The Darwin Initiative has helped create a project run, in part, by the community, for the community; to keep St Helena's marine tourism flourishing, to help fishermen keep fishing for years to come, to protect St Helena's biodiversity, and to conserve its marine habitats for future generations to enjoy.

For more information on project DPLUS070 click **here** or contact Project Leader Annalea Beard, **annalea-beard@enrd.gov.sh**

Community purse seine fishers pulling in their catch of anchovies, Credit: WCS Myanmar

Advancing fisheries co-management to secure coastal livelihoods and conserve marine biodiversity in Burma (Myanmar)

Around the world fish stocks are declining. This is particularly concerning in developing countries like Burma (Myanmar), where about half the country's nearly 60 million people live in coastal regions and are directly reliant on fisheries for their livelihoods and food security. While surveys have identified an 80 to 90 percent decline in Burma (Myanmar)'s marine fish stocks over the last few decades, there are some encouraging trends that may help reverse this situation in the world's ninth largest fishing power.

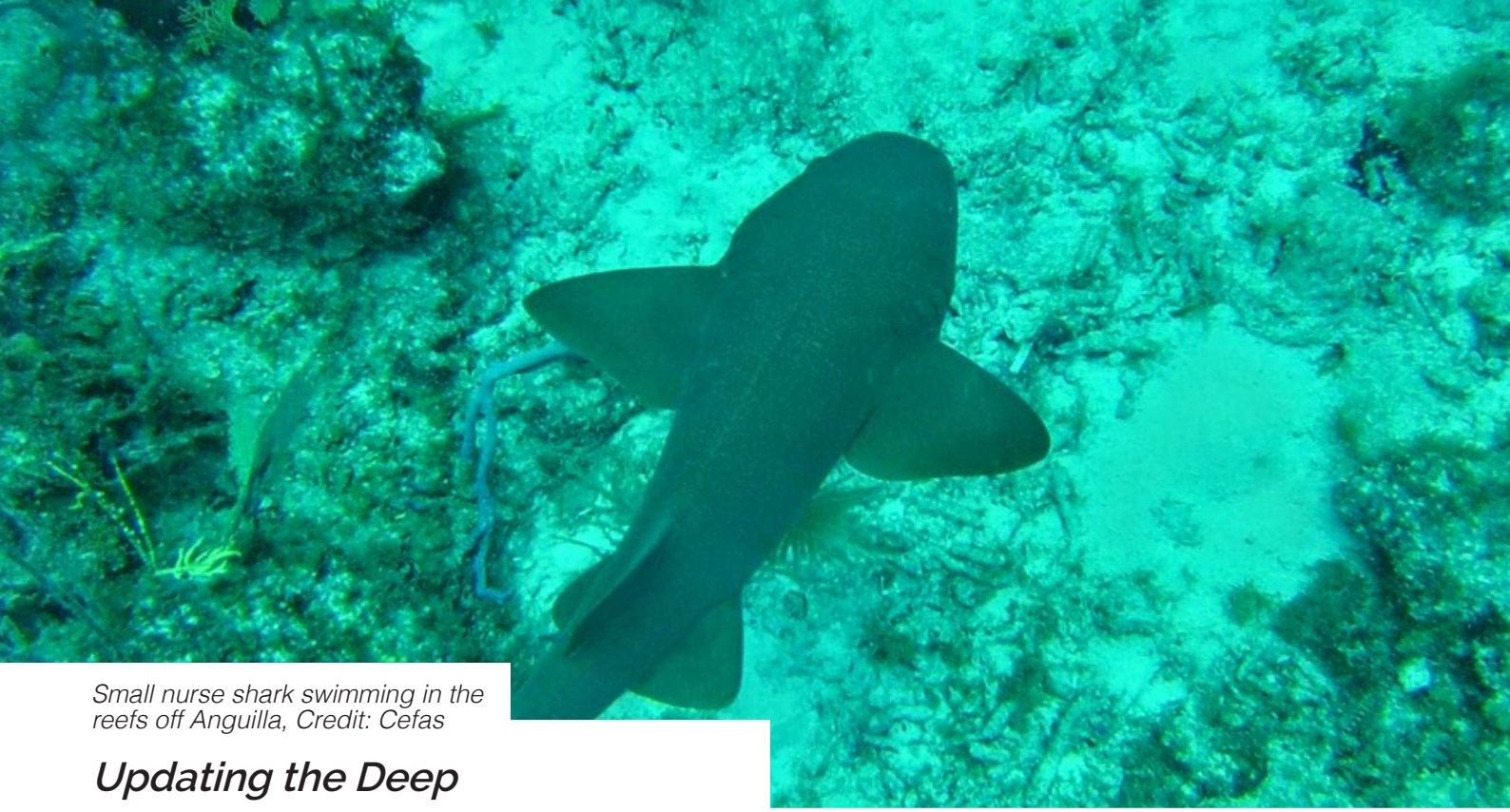
As part of the country's ongoing reforms, the Government of Burma (Myanmar) is decentralising natural resource management to state and regional levels. New laws are being developed that are allowing for community involvement and co-management in the fisheries sector, involving greater cooperation between communities and government officials and enabling local people to have greater control over their local resources - and thereby deriving greater benefits from them.

To demonstrate this new co-management approach, our team at The Wildlife Conservation Society (WCS) Myanmar is working with the Department of Fisheries and local partners to craft a model for co-management. Working closely with the **Rakhine Coastal Region Conservation Association** and **Pyoe Pin**, technical partners like the **University of Exeter**, and with support from the **UK's Darwin Initiative**, we are assisting 10 coastal fishing communities in the Kyeintali area of southern Rakhine State to pilot a co-management model for their inshore fisheries. Our initial efforts have focused on understanding the communities' socioeconomic situation and working with them to analyse their current fishing practices. We did this by mapping existing fishing grounds and compiling information on preferred gear types, target fish species, and fishing activities each season.

We then helped the communities identify a co-management area and establish a committee comprising male and female representatives from each of the participating villages. The area extends across the inshore zone (10 nautical miles from shore) and includes locally-designated areas for protection, such as no take zones, seasonally-closed areas, and turtle nesting beaches. As a next step, we will assist the committee to propose their co-management area to the Department of Fisheries for formal recognition. This will further strengthen the communities' rights over these local resources while aiding them in enforcing community regulations and prohibiting incursions from offshore commercial fishing vessels.

While we continue to support the committee - assisting them in developing and implementing an effective co-management plan and building stronger connections with the Department of Fisheries - we have also begun to identify potential new sites where future co-management arrangements can be replicated. Our long-term goal is to increase fish stocks, conserve biodiversity, and reduce poverty in Burma (Myanmar)'s rural communities by improving sustainable fisheries policies and practices that will eventually benefit thousands of fisheries along the 2,800 km coastline. With support from the Darwin Initiative, we are on our way to achieving this vision.

For more information on project 23-024 click **here** or contact Project Leader Barry Flaming, **bflaming@wcs.org**



Small nurse shark swimming in the reefs off Anguilla, Credit: Cefas

Updating the Deep

Tropical seas around the world support a vast array of species and habitats; from colourful coral reefs to extensive seagrass meadows and fine white sand expanses. These seas also support a significant proportion of the world's population with an estimated 1.3 billion people living on tropical coasts. Many depend on the adjacent seas for food and their livelihoods.

The pressures from human activities can also have detrimental effects on the tropical ecosystems, with well documented cases of pollution, overfishing, and climate change. Management of marine areas, including the sustainable use of the seas and the setting up of Marine Protected Areas (MPA), is a key step in reducing the impact of human activities on the environment and achieving the targets of UN Sustainable Development Goal 14.

When implementing management solutions to benefit ecosystems but which may restrict human activities or access, it is important to be able to measure success. Data are key to establish an evidence baseline from which it is then possible to monitor the environment and say whether an activity or management measure is having an effect, and where necessary adjust the management solution.

In 2016 a consortium of organisations was awarded a Darwin Plus award to assess the marine ecosystems and build a baseline for future monitoring around the Caribbean island of Anguilla. The consortium included the Centre for Environment, Fisheries and Aquaculture Science (Cefas), Environment Systems Ltd, Newcastle University, United Kingdom Hydrographic Office (UKHO) and the Department of Environment, Anguilla. The aim of the project was to map the distribution and extent of the different underwater habitats, including the valuable coral and seagrass beds, within the shallow waters around the island (down to 20 m). With shipping a significant activity around the island, the project set out to accurately map the main channel for shipping to ensure safe access to the island and reduce the risk of associated environmental disasters.

Charts of the waters around Anguilla may look modern, showing a spread of depth observations and winding contours and symbols indicating the sediment and habitat type. It is not until you drill down into the data behind the chart that you find out that most of these depths were recorded over 150 years ago, using a lump of lead on the end of a piece of rope.

“It is not until you drill down into the data behind the chart that you find out that most of these depths were recorded over 150 years ago, using a lump of lead on the end of a piece of rope.”

Today, seabed depths are recorded using an array of high-tech methods ranging from sonar, light and passive systems. In this project two separate methods of seabed mapping were used by the team to map the depths and habitats around Anguilla. The first used a ship based method of collecting high resolution data on the seabed. The multi-beam echo sounder used over 200 beams of

A team of volunteers setting up the boat ready for surveying the deep, Credit: Alison Pettafor

sonar to create an image of the seabed which is built up as the vessel moves along a track. These beams of sound can tell us not only how deep the seabed is but also give a relative measure of how hard and rough it is. As this is only a relative measure this needs to be supported by ground-truthing data in the form of seabed video and imagery.

The second method uses remote sensing data from different satellites to create a map of depth and habitats using the relative absorption of different colours of light by the sea and the seabed. This fairly new method of seabed mapping still requires ground-truthing imagery but does not require the long periods of vessel time which a sonar survey needs. The shorter survey time means the assessment can be carried out at short notice with the data processing occurring in a few hours. This makes it especially useful in areas prone to extreme weather events, such as hurricanes, allowing the rapid assessment of changes in depths and habitats which may affect shipping, fisheries and coastal management. This method is also something which can be done relatively easy without any specialist equipment or programs. All that is required is an underwater camera, and a GIS (geographic information system) program to calculate and create the data.

A sonar image of an unchartered wreck found in Sandy Ground, Anguilla, Credit: Cefas

The new maps and charts along with the training provided in producing them have given the Government of Anguilla the tools it needs to carry on its important work in preserving the marine environment in a sustainable way and achieving the UN Sustainable Development Goals. Our previous Darwin Plus project in the British Virgin Islands, delivering similar data, tools and capabilities has already shown several management actions that have increased protection of important biodiversity features.

Article written by Simeon Archer-Rand and Koen Vanstaen. For more information on project DPLUS045 click **here** or contact Project Leader Koen Vanstaen, **koen.vanstaen@cefas.co.uk**

Nassau Grouper - traditionally an important target of commercial spearfishers, Credit: Alex Tewfik

Conservation and socio-economic benefits of a marine protected area at Glover's Atoll, Belize

Marine protected areas (MPAs) are now common. They have evoked considerable public interest and have become one of the more popular tools within an ecosystem-based management approach to balance environmental health and biodiversity conservation, with socio-economic needs of fishing communities across the world's oceans.

Areas within MPAs where all extractive use is prohibited are traditionally referred to as 'no-take areas'. These may be embedded within larger marine reserves that include areas for legal extraction of marine resources. However in Belize, the term 'replenishment zone' (RZ) has recently been adopted in place of 'no-take zone' to emphasize the potential benefits to small-scale fisheries (SSF) based livelihoods, both within the RZ and in surrounding fishing areas. The term 'replenishment zone' has a less negative connotation for resource users concerned about being restricted from fishing in traditional waters.

The benefits associated with RZs include conservation of biodiversity, improved fisheries yields, and protection of ecosystem structure and function. The ecological basis for benefits to target species from RZs begins with the development of a high density of large, mature, and highly fecund (fertile) individuals within the RZ. Once such densities are in place, wider benefits may occur through the net export of larvae ('recruitment effect') and the net emigration of post-settlement animals ('spillover effect') from the RZ.

This Darwin project led by the WCS Belize Programme works with fishers in Belize to ensure the long-term sustainability of the fisheries they rely on, particularly queen conch and Caribbean spiny lobster. The cooperation of local fishers is crucial, and so their perception of the role of these protected areas is pivotal to project success. Interventions are focused on the Glover's Reef Atoll which has an area of 350 km2 and lies approximately 42 km east of the central Belizean mainland. This atoll is 1 of 7 protected areas that comprise the Belize Barrier Reef Reserve System, inscribed as a UNESCO World Heritage Site in 1996.

A recent study, conducted as part of the project and published in the international journal Marine Ecology Progress Series, examined changes in populations of a range of key species at the Glover's Reef Marine Reserve (GRMR). The study compared a series of lagoon patch reefs in the RZ with those in the general use zone (GUZ), where fishing is allowed, and estimated changes in overall density, biomass, and size of focal species. Results were then looked at in the context of changes in catch over a seven year time period.

Study findings demonstrate the positive impact of protection within the RZ. Importantly they also identify associated increases in catch per unit of effort (CPUE) within the GUZ, and the benefits of RZs for SSF livelihoods. The focal species of this study included conch and lobster, which are the basis of the two most important SSF in Belize and throughout the Caribbean region. Commercially important fish species included in the study were black grouper, Nassau grouper, mutton snapper, hogfish, and queen triggerfish, as well as six common parrotfish that have been banned from harvest in Belize since 2009 given their importance as reef herbivores.

A free diver searches for Queen Conch within Glover's atoll lagoon, Credit: Alex Tewfik

Interestingly, the study demonstrated that the increases of commercially important species and, perhaps more importantly, the positive trends in catch outside of the RZ, are not due to habitat differences between the RZ and GUZ. The major reef structural components have been in decline for some time across the region and this study raises questions about how marine conservation can best be achieved in the face of wider challenges, such as the increasing cover of nutrient-loving macroalgae.

Despite this, the benefits observed following the establishment and enforcement of the RZ at Glover's Atoll have been supported by a broader set of fisheries conservation strategies, such as size limits, closed seasons, and species bans. The sustainability of this approach will be assured by continuing long-term community consultations that support the core objectives for the management of GRMR, enhancing economic benefits for Belizean fishers.

The results of this research will also be used to inform the ever evolving conservation and management strategies employed by WCS across Belize. Ultimately the aim is to achieve a balance between biodiversity and ecosystem services protection, including fisheries and tourism-based livelihoods. Doing so will help to secure the future of the UNESCO World Heritage Site, the Belize Barrier Reef System, and will generate findings with broader applicability across the Mesoamerican Reef.

Spiny lobster is the most important fishery and the largest seafood export for Belize, Credit: Alex Tewfik

A more comprehensive account of this research discussed in this article is available in:

Alexander Tewfik, Elizabeth A. Babcock, Janet Gibson, Virginia R. Burns Perez, Samantha Strindberg. 2017. Benefits of a replenishment zone revealed through trends in focal species at Glover's Atoll, Belize. Marine Ecology Progress Series 580: 37–56.

For more information on project 22-014 click **here** or contact Alexander Tewfik, **atewfik@wcs.org**

Monda and team conducting a survey, Credit: Christina Saylor, Blue Ventures

Collaborating to save seagrass: communities in Timor-Leste embrace a new opportunity for conservation

Monda Costa stands chest deep in the sea. The baking mid-morning sun illuminates the blue water as she peers at a square on the seafloor. Two others from Monda's home island of Ataúro and a **Blue Ventures volunteer** assess the same ground.

Where an untrained eye would only see drab plants, the team recognises and records two species of seagrass - *Thalassia hemprichii* and *Syringodium isoetifolium*. Their work is part of a community-based monitoring (CBM) programme established by Blue Ventures to involve Ataúro's residents in collecting baseline data on seagrass beds - a first step in longer-term efforts to empower communities to protect these and other threatened habitats.

Ataúro Island is in Timor-Leste, which lies within the famed Coral Triangle. So called for its incredibly diverse and teeming reefs, the Coral Triangle has long supported coastal people, like Monda and her family, with its rich resources. The area is also a magnetic destination for scuba divers and other tourists who come to see the spectacular reefs bustling with bright fish and other alluring creatures. Yet without seagrass, these reefs could not flourish.

Seagrasses are flowering plants that form meadows in shallow waters. These meadows are ecological superstars. They trap carbon and produce oxygen, act as nurseries for young reef fish and provide grazing grounds for crowd-pleasing animals like green turtles and dugongs.

Protecting these valuable habitats is a priority in Timor-Leste, but scientists, community members and decision-makers need more information about the location, composition and use of existing seagrass beds.

Fourteen people from local villages, half of whom are women, have come to take part in seagrass surveys on this particular morning. They are eager to participate and with good reason. On Ataúro Island, as in other coastal areas, resources are dwindling as global and local factors affect the health of marine ecosystems and demand changes from coastal communities.

“On Ataúro Island, as in other coastal areas, resources are dwindling as global and local factors affect the health of marine ecosystems and demand changes from coastal communities”

In Timor-Leste, the power for change lies within each community. Establishing locally-managed marine areas is **a decision made and enforced by villages** through the customary law of tara bandu. Informed voices are a critical part of this decision-making.

“I can now tell my community about why seagrass is important for the fish and why it's good to protect the seagrass beds. Seagrasses provide food for fish, turtles and other animals. And one day more tourists will come and want to see the seagrass and the fish and turtles,” says Monda. “We don't want people from outside to decide how our resources are used. We need to control and protect our resources.”

Nick Piludu, Blue Ventures' Country Manager, in Timor-Leste explains why engaging communities in monitoring is important:

"We work with local communities to develop ways to manage their marine resources sustainably by involving them in monitoring and supporting them to identify alternative livelihoods, which is important to ensure that conservation can make financial sense. Together with our other initiatives, the CBM programme on Ataúro helps communities to understand and be in charge of their own natural resources."

> "We don't want people from outside to decide how our resources are used. We need to control and protect our resources"

CBM participants receive training on the ecological role and the economic value of seagrass meadows. They also learn technical skills for conducting surveys - from laying measuring tape on the seafloor to identifying species and sediment types. Training is voluntary, but once they pass certification tests, surveyors are paid for their time.

Blue Ventures' Conservation Assistant Jenny House, who is leading the CBM programme, notes that augmenting and tailoring training is critical to helping participants succeed.

"We want the CBM programme on Ataúro to be accessible to as many community members as possible. Some, for example, have less confidence in applying mathematical concepts while others are not skilled swimmers. So we spend time practising percentage calculations and conducting swimming lessons with those who need it," says Jenny.

"It's challenging, but we have seen a strong commitment. People on Ataúro are embracing this opportunity to become involved in conservation."

This tailoring is particularly important because it ensures women can participate. Traditionally, Timorese women have had fewer opportunities than men to earn an income or be active voices in community decision-making. When asked why she participates, Monda is quick and sure:

"The seagrass monitoring programme gives me, as a woman, an opportunity to participate in an activity that is important to the community."

The benefits of Ataúro's CBM programme align with Timor-Leste's commitment to SDG 14 - conserve and sustainably use the ocean, seas and marine resources for sustainable development. By implementing a science-based management plan, the communities on Ataúro will be better equipped to improve ocean health, and the increase in scientific knowledge and research capacity in both men and women will contribute to the sustainable development of Timor-Leste.

Article written by Blue Ventures volunteer **Christina Saylor**. For more information on project 24-012 click **here** or contact Project Leader Alasdair Harris, **al@blueventures.org**

A BV volunteer from Singapore with CBM surveyors, Credit: Christina Saylor

An octopus export company's agent showing an example of premium value catch, Credit: Timur Jack-Kadioglu, Mwambao

Supporting effective co-management in the Pemba Channel Conservation Area

Of the two islands making up the Zanzibar archipelago, the less populated and developed Pemba Island can be considered an oceanic island, as it is 50 km off the mainland and separated by a 700 metre-deep channel. It hosts some of the richest marine biodiversity in Tanzania and the East African coast with its extensive reefs and mangroves, including turtles, dolphins, and occasional dugongs and whales. Pemba Channel MPA ("PECCA"), stretching the entire West coast of the island, aims to safeguard these habitats and species.

Marine life is also one of the main sources of subsistence and income for relatively remote coastal communities, who have witnessed reduced fish catches due to overexploitation and damaging fishing practices – such as the use of destructive drag-nets or dynamite fishing.

Since 2015, with initial funding from *SmartFish* (a programme implemented by the Indian Ocean Commission), Fauna & Flora International (FFI) has been working with the NGO **Mwambao Coastal Community Network** (Mwambao) and the Department of Fisheries Development to provide training and advice to help fishing communities protect their fisheries and marine habitats, and become leaders in community-driven marine conservation in Pemba. This work began on the remote islet of Kisiwa Panza, where we worked to trial a temporary octopus fishing closure to help recover stocks, build support for local marine conservation, thus contributing to the management of PECCA at a sea-scape level.

The quick and impressive results of this work led neighbouring communities to request support for similar actions. In 2017, Darwin Initiative funding has allowed Mwambao to hire a local staff member permanently based on Pemba to work on strengthening governance, as well as giving us scope to expand to more communities. Since last year 4 closures have been supported across two communities, reducing fishing pressure across 311 ha. Thanks to community data recorders, who regularly monitor the individual weights of octopus caught, we have robust evidence to show that closing areas to fishing increases total octopus catches threefold. Recent community-led in-water monitoring activities also indicated that some juvenile fish densities are higher in the closed areas than outside (including important species for regulating sea urchin proliferation), so we are beginning to see broader biodiversity benefits.

Crossing the channel between main Pemba island and Kisiwa Panza, Credit: Hannah Becker, FFI

The embarking point from Kisiwa Panza, Credit: Tanguy Nicolas, FFI

Improved knowledge on sustainable fishing practices, increasing fishing returns, and better access to markets for their catches, creates strong incentives for local communities to act collectively and engage in the management of their fishing grounds. For instance, some decided to share the benefits of the increased prices during the opening of their temporary closure to fund the village school. These empowered fishing committees are increasingly supported by the government of Zanzibar – who is starting to recognise the opportunities of co-management and the specific role of communities in achieving more effective marine management across Pemba, for example, supporting enforcement of fishing regulations by patrolling their local fishing grounds.

> “Marine life is also one of the main sources of subsistence and income for relatively remote coastal communities, who have witnessed reduced fish catches due to overexploitation and damaging fishing practices – such as the use of destructive drag-nets or dynamite fishing”

While we have made great progress, there is still work to be done. A new fishers' committee has been elected in Kisiwa Panza; after a few recent trainings and community discussions they are now considering various options to implement new management measures.

Now that a few pioneering communities are convinced about the benefits of managing their area and fishing more sustainably, we plan to support new neighbouring communities and then consider how local management efforts can be coordinated.

Darwin Initiative support will allow us to better understand and provide more clarity about enforcement responsibilities and legislative processes for the fishers' committees and local authorities through training and the production of tools to facilitate this co-management dynamic. This forms a critical component of the project needed to help resolve some conflicts with those fishers who are not following the rules and to ensure all management is legal. Addressing these hurdles will form a major part of our ongoing work.

Article written by Tanguy Nicolas and Nicola Frost. For more information on project 24-008 click **here** or contact Project Leader Nicola Frost, **nicola.frost@fauna-flora.org**

CCMI's IYOR outreach Jan 2018, to engage local stakeholders in protecting Coral Reefs, Credit: Maggie Jackson

The Central Caribbean Marine Institute (CCMI) launches International Year of the Reef (IYOR)

In order to achieve the UN Sustainable Development Goal 14 (SDG), "Conserve and sustainably use the oceans, seas and marine resources for sustainable development," global leaders and scientists must provide and communicate a deeper understanding of the complex interspecies dynamics that determine the balance of life under the sea.

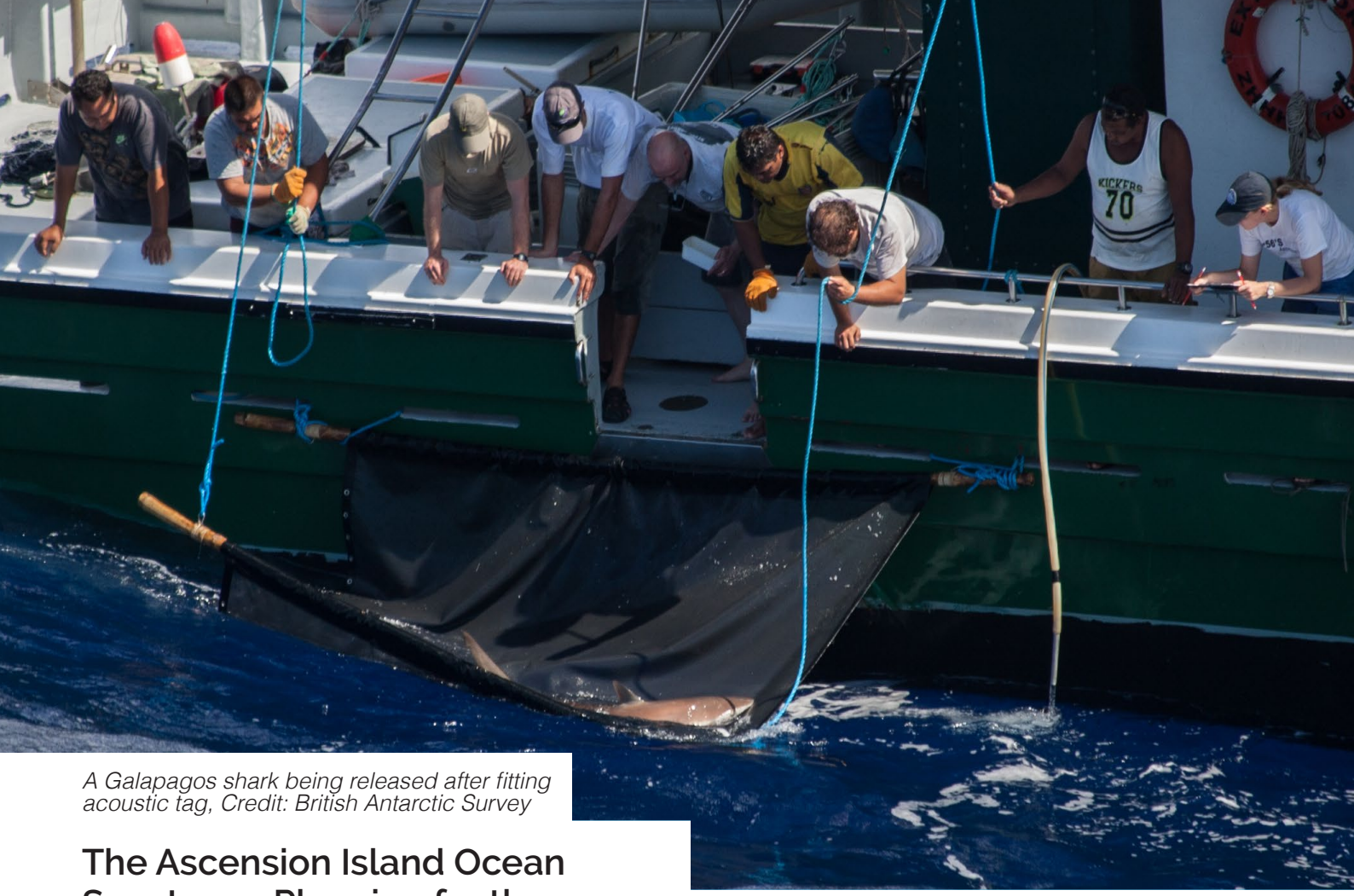
CCMI's Dr. Manfrino posited in the United Nations Chronicle article last summer **"Can We Save Coral Reefs?"** that much more aggressive action is needed on a societal level in order to reduce negative human impacts on coral reefs. In response to the SDG#14, CCMI has developed a range of impactful outreach activities to support Manfrino's stance on coral reefs during this third International Year of the Reef (IYOR). IYOR 2018 is an excellent opportunity to boost public, private, and governmental efforts to ensure that our seas and especially coral reefs are protected via sustainable efforts and regulations which benefit our society on numerous levels.

One area of CCMI's research, funded through Darwin Plus (and the Alexandria Trust) is examining which key herbivorous fish species on Caribbean coral reefs are consuming the most problematic species of algae. Careful evaluations of 11 dominant fish species have led to a new discovery that both chubs and certain species of parrotfish are eating the largest volumes (biomass) of algae over large areas. At a time when climate change is pushing competitive interactions to a tipping point, protecting these species provides additional resilience to the coral reef ecosystem as a whole. The work is a collaborative effort between CCMI (led by Dr. Claire Dell), the Cayman Islands Department of Environment and the Smithsonian Institute Marine Conservation Programme and will lead to a draft biodiversity action plan for key species. Dell is working with local fishermen and stakeholders to engage the community in a dialogue that hopes to find new solutions to age old problems.

In addition to maintaining over 25% of all marine species, healthy coral reefs provide a powerful physical barrier that shields coastal communities from over 90% of the wave energy generated by storms. Corals create the framework and calcareous algae that cements reefs together. As the reef structure degrades, lagoon habitats become open to ocean waves, and mangroves and shorelines erode. In the end, protecting key species on the reef relies on our community of stakeholders making informed decisions based on good data. The CCMI Herbivorous Fish Darwin project will be featured in the CCMI's Reef Lecture Series in April 2018 in the Cayman Islands. We are asking citizen scientists and tourists to join our "IYOR - Zero Impact" campaign which describes how we as individuals can help protect coral reefs for the future.

For more information about CCMI's IYOR activity, please click here: **https://reefresearch.org/get-involved/iyor2018/**. For more info on the Herbivorous Fish Project: **https://reefresearch.org/what-we-do/research/improving-resilience/**

For more information on project DPLUS061 click **here** or contact Project Leader Carrie Manfrino, **manfrino@reefresearch.org**



A Galapagos shark being released after fitting acoustic tag, Credit: British Antarctic Survey

The Ascension Island Ocean Sanctuary: Planning for the Atlantic's largest marine reserve

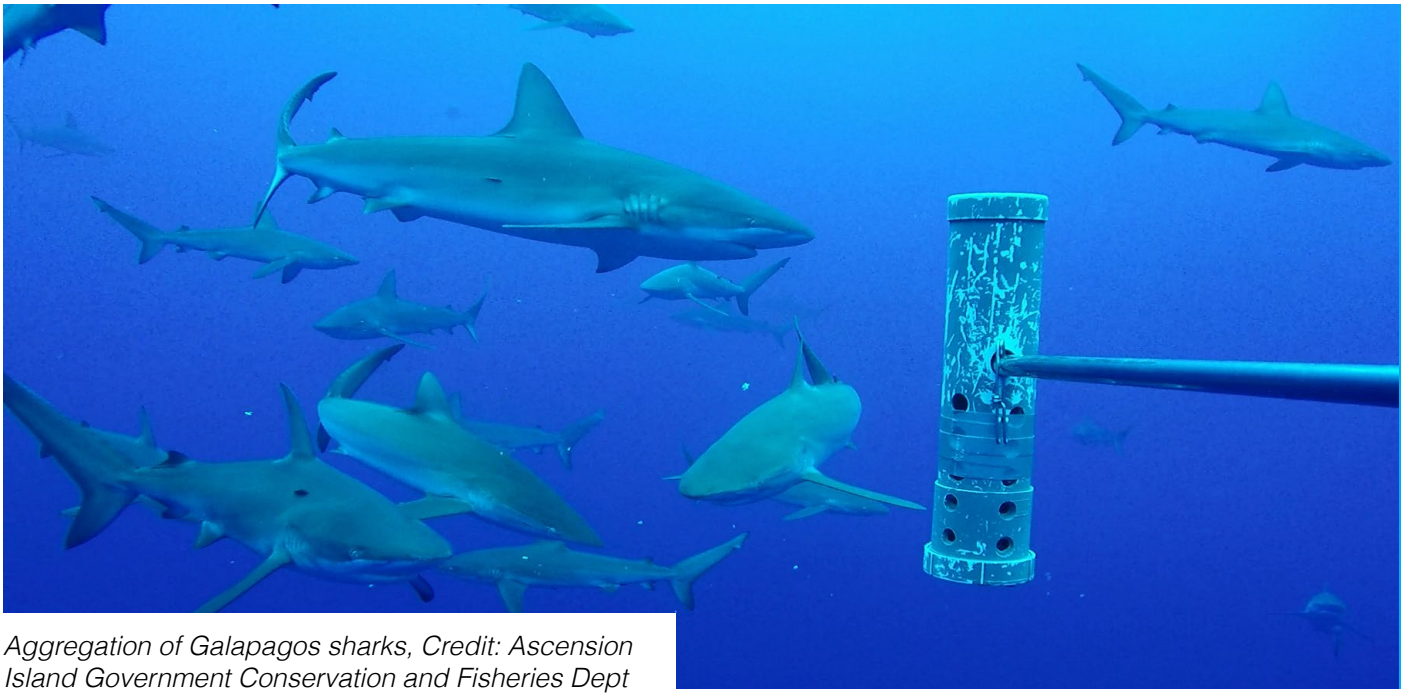
Although many people would struggle to find it on a map, the remote UK Overseas Territory of Ascension Island is on the verge of entering the 'big league' of ocean conservation, joining such notable company as the Great Barrier Reef and the Galapagos Islands as home to one of the world's largest marine reserves.

The intention to close at least 50% of Ascension's 440,000 km^2 exclusive economic zone (EEZ) to all forms of commercial fishing by 2019 was formally announced by the UK Government at the UN Our Oceans summit in September 2016 and will establish the largest fully-no-take marine protected area (MPA) in the Atlantic Ocean. The licensed offshore tuna fishery that had operated intermittently since 1988 was suspended and subsequently re-opened in the northern half of the EEZ under more stringent license conditions while long-term decisions on the location, size and financing of a future MPA could be taken.

Providing the scientific and technical data to support these decisions is currently the focus of a two-and-a-half year Darwin Plus project led by the Ascension Island Government Conservation & Fisheries Department and the University of Exeter and supported by a multitude of partner organisations. The Ascension Island Ocean Sanctuary (ASIOS) Project aims to address many of the challenges and controversies common to all remote, large-scale MPAs: How can it be enforced? How effectively will it conserve the highly mobile species of the open ocean? How do we measure its success? The project is also responding to the mandate of local and UK Government stakeholders to assess whether an economically-viable and well-managed fishery can co-exist with a future MPA in a portion of the EEZ, and, if so, which areas should be protected.

With the support of international partners and collaborators, the ASIOS project has already compiled electronic tracking data for 15 species of shark, fish, birds and turtles. This has begun to provide insights into how marine megafauna use Ascension Island's EEZ and how they may benefit from different scales of marine protection (please see the **project's online tracking map**). As one might expect, not all species stand to benefit equally. Some nomadic species such as blue marlin and blue shark appear to be only transient visitors to Ascension's waters, and to any future marine reserve, while others, including Galapagos sharks and even tunas, spend long periods around the Island and its outlying seamounts where they may be highly amenable to protection.

Oceanic islands and seamounts are known to be hotspots of abundance and diversity for pelagic species and are obvious focal points for the creation of marine reserves. In order to better understand the scale of their



Aggregation of Galapagos sharks, Credit: Ascension Island Government Conservation and Fisheries Dept

'bio-aggregating' effect, in May 2017 the ASIOS project team joined forces with National Geographic Pristine Seas and the British Antarctic Survey on an EU BEST-funded expedition to survey the biodiversity of three previously unstudied seamounts lying 260-320 km to the south and west of Ascension. Arriving amidst a flotilla of silky and Galapagos sharks, few were left in any doubt that these were special places, worthy of protection.
To determine how large an area needs protecting, the expedition set out to measure how the abundance and diversity of marine life at all levels of the food chain varies with distance from each mount, as well as mapping the movements of individual top predators associated with them. These datasets, now in the latter stages of analysis, will hopefully provide a rare insight into the "biodiversity footprint" of a tropical seamount system that can contribute to MPA planning on Ascension and beyond.

> "Although many people would struggle to find it on a map, the remote UK Overseas Territory of Ascension Island is on the verge of entering the 'big league' of ocean conservation, joining such notable company as the Great Barrier Reef and the Galapagos Islands as home to one of the world's largest marine reserves."

At the time of writing, many of the ASIOS team are on-board the offshore patrol and research vessel that is chartered annually by the Ascension Island Government with funding from Darwin Plus and the UK Foreign and Commonwealth Office. The patrol is guided by cutting-edge, satellite-based vessel detection systems that help to identify and intercept illegal fishers not transmitting on the 'automatic identification systems' required of large, ocean-going craft. Through a new collaboration with the NERC Earth Observation Data Acquisition and Analysis Service (NEODAAS) and Plymouth Marine Laboratory, the vessel is also being guided by meteorological satellites which can track the ever-shifting mosaic of fronts, eddies and water masses that constitute the habitats of the open ocean. It is hoped that by studying these features scientists can gain a better understanding of the distribution of life in the vast expanse of the EEZ that is not adjacent to islands and seamounts, allowing them to identify important areas for inclusion within a marine reserve.

With less than two years until designation there is still much to be done; however, with the support of Darwin Plus, the European Union's BEST 2.0 initiative and other donors, the Ascension Island Ocean Sanctuary promises to put the Territory firmly on the map as a global leader in MPA science and management.

For more information on project DPLUS063 click **here** or contact Project Leader Sam Weber, **sam.weber@ascension.gov.ac**

Northern Rockhopper penguin, or pinnamin, as the locals on Tristan da Cunha call their penguins, Credit: Antje Steinfurth

General project updates

Northern Rockhoppers on Alex (Middle) Island with Nightingale Island in the background, Credit: Antje Steinfurth

Helping to protect one of the UKOTs' most iconic, yet threatened, species – the Northern Rockhopper penguin

Tristan da Cunha is the UK's remotest overseas territory and home to one of the UKOTs most iconic yet threatened species – the Northern Rockhopper penguin *Eudyptes moseleyi*, or pinnamin, as the locals call their penguins.

Tucked away in the South Atlantic Ocean, mid-way between South Africa and South America, lies Tristan da Cunha. From the compelling human history to the unique flora and fauna, these islands have captured the hearts of many visitors.

Approximately 85% of the world's Northern Rockhopper penguins are found in the islands, which makes the species' stronghold fall within the boundaries of the UK Overseas territory. This claim to fame however comes with some responsibility as it means that just one single catastrophe could prove disastrous to the global population.

This message was driven home in March 2011 when the cargo ship MS Oliva ran aground off the north-western coast of Nightingale Island. Approximately 1,500 tons of fuel and heavy crude oil escaped from the ship, encircling Nightingale, and adjacent Middle (or Alex) islands, the breeding sites of almost half the world's Northern Rockhopper population.

Even though the oil spill had nothing to do with past population declines nor might it be responsible for the fluctuations that followed, what the catastrophe did reveal and highlight in a most striking manner was how little is known about this Endangered species, and that basic but vital information on the species' general ecology had been almost totally lacking.

Surveys carried out by the Tristan Conservation Department have provided an important and valuable tool to estimate annual population sizes, but are of little help identifying factors and understanding the mechanisms that are driving population trends and dynamics. This is crucial for any decision-making and the design of an adequate conservation programme.

> "Northern Rockhopper penguin numbers are in decline and it is our job to find out why"

In 2015, the RSPB partnered with the Tristan Conservation Department, the British Antarctic Survey, the Royal Zoological Society of Scotland and the South African Department of Environmental Affairs, and was awarded funding from Darwin Plus, coinciding with the 5th anniversary of the oil spill, and *Project Pinnamin* was born.

Using a combination of traditional observation and cutting-edge tracking tools, *Project Pinnamin* aims to investigate the penguins' marine ecology, breeding biology and population dynamics to help understand the potential impact of any natural and/or anthropogenic

George Swain, Riaan Repetto, and Matthew Green on Alex (Middle) Island after the annual penguin census, Credit: Antje Steinfurth

threats to this population. To do so, we have been gathering tracking data from Nightingale, Gough and Inaccessible islands during different years and phases of the penguin's annual cycle to quantify temporal and spatial habitat preference and assist in determining whether there is a need to improve and/or design and implement long-term conservation strategies, including areas of marine protection in Tristan waters. Our data have shown that the islands' Exclusive Fishing Zone is an important foraging area for the Northern Rockhopper penguin, predominantly during the breeding season when adults are most constrained to forage close to their nests.

Results were presented at two workshops held in July 2017 at the RSPB and the UK's Foreign and Commonwealth Office to inform the stakeholders involved in implementing and managing the Blue Belt marine conservation zones around the UK Overseas Territories, including the Tristan da Cunha government, Marine Management Organisation and Cefas – the Centre for Environment, Fisheries and Aquaculture Science.

Before *Project Pinnamin* comes to an end in March 2018, we held a two-day workshop at Edinburgh Zoo, to write a new Species Action Plan for the conservation of Northern Rockhopper penguins. The overarching objective was to develop research and conservation objectives and actions for the Northern Rockhopper penguin to ensure populations in the Atlantic and Indian Ocean populations can thrive into the future.

"Conserving nature, preserving cultures"

Since people settled on Tristan in the early 1800s, the penguins have played a key role in the island's traditions. While, without doubt, science and research plays a crucial role in the conservation of the species, it is only the local community who can achieve lasting conservation success.

Article written by Antje Steinfurth. For more information on project DPLUS053 click **here** or contact Project Leader Andy Schofield, **andy.schofield@rspb.org.uk**

Penguin chick a few days after hatching, Credit: Antje Steinfurth

Fishers and their prize - a big scalloped hamerhead, Credit: Rifky (Indonesia Nature Films Society)

Newsletter Contacts

The Darwin Initiative Secretariat (Defra)

The Darwin Initiative Secretariat (Defra) The Darwin Secretariat is based in Defra and includes Claire Millar, Fiona Charlesworth, Duncan Robertson, Siriol Leach and Shaluki Perera.

If you have any general queries about how the Darwin Initiative operates please e-mail us at **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** or **darwin-projects@ltsi.co.uk**

This newsletter is produced quarterly. To include an article on your project please contact us at **darwin-newsletter@ltsi.co.uk**

The UK Government's Darwin Initiative aims to promote biodiversity conservation and sustainable use of resources around the world including the UK's Overseas Territories. Since 1992, the Darwin Initiative has committed over £140 million to 1,055 projects in 159 countries.