



Blue Belt Programme

Annual Update for Financial Year 2018/19



Marine
Management
Organisation



Centre for Environment
Fisheries & Aquaculture
Science



Funded by
UK Government



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Introduction

The Blue Belt Programme supports the delivery of the UK government's commitment to enhance marine protection for over four million square kilometres of marine environment across the UK Overseas Territories (UKOTs).

The programme is providing up to £20 million between 2016 and 2020 to:

- **Improve scientific understanding of the marine environment**
- **Develop and implement evidence-based, tailored marine management strategies, including novel and effective approaches to surveillance and enforcement across these very remote and sparsely populated areas**
- **Ensure management is sustainable and long term**

The Blue Belt Programme is assisting the UKOTs to enhance or develop cost-effective strategies to ensure the long-term sustainable management of their vast marine areas. Management strategies will be based on an enhanced understanding of the marine environments from surveys and data collection and be underpinned by appropriate governance structures. Importantly, this will support UKOT communities in sustainably developing their local economies whilst

also protecting vulnerable ecosystems which support rich marine life. The design of the marine protection measures will be evidence-based and in accordance with the priorities of territory governments and views of local stakeholders.

The programme is supported by an innovative partnership between two world leading agencies of the UK Government, the Centre for Environment, Fisheries and Aquaculture Science (Cefas) and the Marine Management Organisation (MMO). In partnership with the UKOTs the Blue Belt delivery partners have developed schemes of work to help them understand their marine environments, design appropriate marine management and protection strategies, and develop effective monitoring, surveillance and enforcement strategies.

Through the Blue Belt programme, the UKOTs are able to access resources and long-term scientific, management, monitoring and surveillance expertise, both from the UK and in situ, as well as benefiting from economies of scale for practical

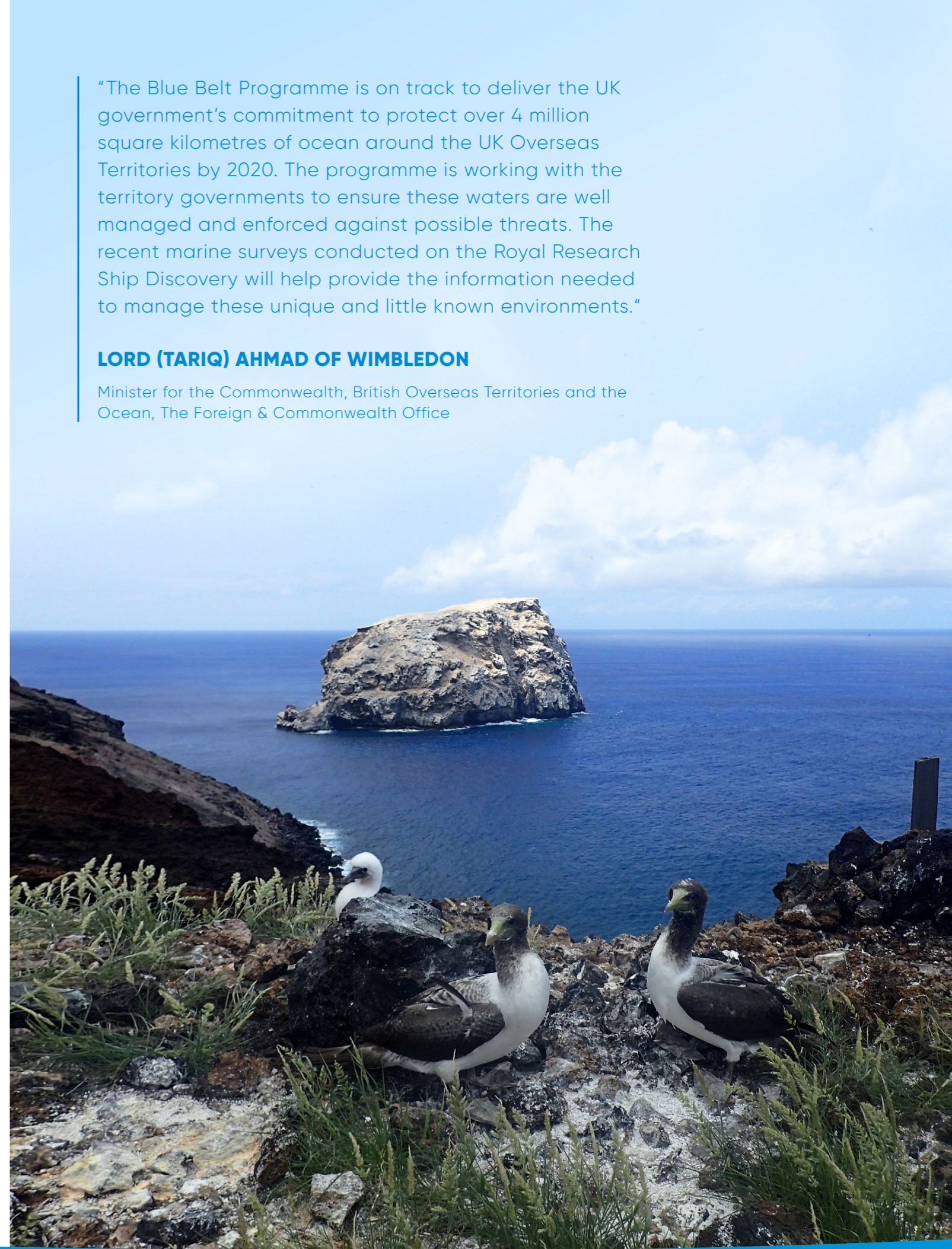
surveillance and technology solutions. By pooling capability the partnership will achieve a legacy that will protect a wealth of globally significant diversity, from vast penguin colonies in South Georgia & the South Sandwich Islands to the marine turtles of Ascension Island. Since its initiation, the Blue Belt Programme has made substantial advances working with stakeholders (including UKOT-specific work by non-government organisations) to identify and conduct priority work commitments.

The focus now is to utilise the evidence gathered to inform and produce protection and enforcement strategies, working closely with each UKOT. This publication describes what the Blue Belt Programme has achieved over the last year and sets out our important activities for the coming year. It demonstrates our achievements within individual territories as well as the cross-cutting work we are doing across all the territories, such as engaging with the Regional Fisheries Management Organisations (RFMOs) to better manage fish stocks that straddle national boundaries.

“The Blue Belt Programme is on track to deliver the UK government's commitment to protect over 4 million square kilometres of ocean around the UK Overseas Territories by 2020. The programme is working with the territory governments to ensure these waters are well managed and enforced against possible threats. The recent marine surveys conducted on the Royal Research Ship Discovery will help provide the information needed to manage these unique and little known environments.”

LORD (TARIQ) AHMAD OF WIMBLEDON

Minister for the Commonwealth, British Overseas Territories and the Ocean, The Foreign & Commonwealth Office



Ascension Island



Ascension Island is situated in the tropical South Atlantic and its 445,390 km² Exclusive Economic Zone (EEZ) has historically been an important area for commercial tuna fishing. The Ascension Island Government has agreed to establish a Marine Protected Area (MPA) that will permanently close at least 50% of the island's waters to commercial fishing. The Blue Belt Programme has been supporting Ascension Island Government in the process of identifying possible MPA configurations. A designation of the MPA and associated management plan is expected before the end of 2019.



A fairy tern bird on Ascension Island

Strengthening governance

To ensure that the legal framework for a proposed Ascension Island MPA is fit for purpose the Blue Belt team have been working with the Ascension Island Government to amend the existing primary legislation and to prepare

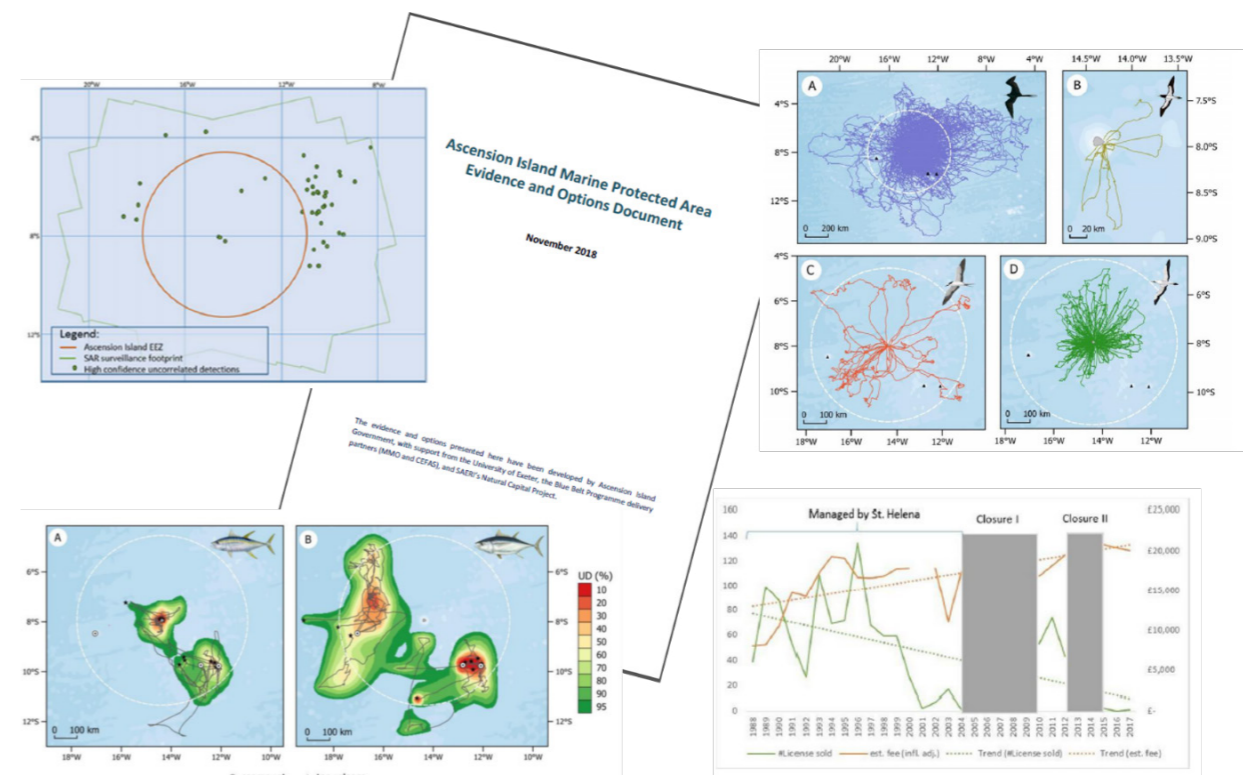
secondary legislation which will create and underpin the new MPA.

Understanding and protecting biodiversity

Working closely with the Conservation and Fisheries Department and Exeter University researchers, the Blue Belt Programme has supported the development of an Ascension Island Government 'evidence and options' report. The report includes information on marine biodiversity research, an economic assessment of the current longline fishery and an assessment of the level and costs of managing commercial fisheries. In February 2019, the finalised report and feedback from stakeholders was presented to the Ascension Island Council to help inform their decision on an appropriate MPA.



A green turtle returning to the sea after nesting



Ascension Island Government 'evidence and options' report

To support the MPA design and designation process outlined in the evidence and options report the Blue Belt Programme undertook two major studies. The first was an assessment of the future economic viability of the existing big-eye tuna fishery, the second study was an evaluation of the minimum recommended management, compliance and enforcement costs that would be incurred under a range of management scenarios for Ascension waters.



A sooty tern bird on Ascension Island



Blue marlin successfully tagged and released on Ascension Island

The Blue Belt team provided expertise to the AIG Conservation and Fisheries Department with research surveys in Ascension waters. During the fisheries survey, several blue marlins were fitted with satellite tags and the team recovered 13 acoustic receivers from Gratton Seamount, one of Ascension Island's most important marine habitats. The information from the tags and the acoustic receivers will show how species use marine habitats within the Ascension Island EEZ.



Licensed longline fishing vessel in Ascension Island waters

Supporting compliance and enforcement

The Blue Belt team provided support during the monitoring of licensed fishing vessels that were operating within the Ascension Island Exclusive Economic Zone (EEZ), assisted with fisheries patrols and provided advice and feedback on the Ascension Island Government Inshore Fisheries Advisory Council (IFAC). The IFAC was formed by the Ascension Island Conservation and Fisheries Department to help increase public engagement and define monitoring and management strategies for important inshore species, targeted by both recreational and sports fishermen.



English Bay, Ascension Island

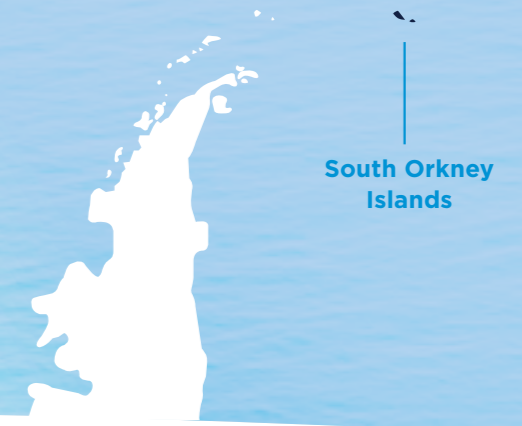
"The Overseas Territories are all at different stages in protecting their marine environments and face different challenges and opportunities. I think the strength of the Blue Belt Programme is that it is flexible and driven by the needs of the territory. On Ascension we have greatly benefitted from the support provided by our Blue Belt partners to ensure decision makers on the island have been presented with comprehensive information and considered all the potential options as they determine what form of marine protection to recommend. The advice and training they have provided on stock monitoring and fisheries enforcement have been invaluable."

Diane Baum, Ascension Island Government Conservation and Fisheries Director

Work Plans 2019–2020

- Support Ascension Island Government (AIG) in the preparation and implementation of a marine management and monitoring plan and Marine Protected Area (MPA) legislation
- Support AIG in the MPA designation process
- Provide advice to AIG on the development of inshore fisheries management frameworks
- Assess existing and new technologies in relation to future fisheries enforcement and surveillance initiatives

British Antarctic Territory



South Orkney Islands



A chinstrap penguin

The waters around the British Antarctic Territory are amongst the most productive in the Southern Ocean, supporting large populations of krill, which, in turn feed larger predators, such as baleen whales, penguins and seals. A fishery for Antarctic krill operates during the austral summer, and there is a small research fishery for the valuable Antarctic toothfish. Both are managed by an international body, the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR). The first CCAMLR Marine Protected Area was created near the South Orkneys in 2009, based on a scientific rationale presented by the UK.

Supporting sustainable fisheries management

Over the past year, the Blue Belt Programme has undertaken a comprehensive review of fishing activity in the region to help inform management strategies. The team have also developed algorithms for satellite surveillance and explored alternative surveillance tools in the region.

"The Southern Ocean around Antarctica is a hostile environment, and we lack a detailed understanding of the systems, habitats and species within it. The Blue Belt Programme has provided the opportunity to build our scientific understanding of the region, and has provided vital surveillance tools to protect this vast area."

Ben Merrick, HM Commissioner for the British Antarctic Territory

Work Plans 2019–2020

- Support for the South Orkneys Southern Shelf MPA review conducted by CCAMLR in 2019
- Continue the collaborative partnership with the British Antarctic Survey on marine science and advice on management in the British Antarctic Territory region

British Indian Ocean Territory



Turtle cove in Diego Garcia



Turtle cove in Diego Garcia

The British Indian Ocean Territory (BIOT) is situated in the central Indian Ocean and made up of 58 islands and atolls. The archipelago is surrounded by a 640,000 km² maritime zone which was declared a 'no-take' Marine Protected Area (MPA) in April 2010. A low level of recreational fishing is allowed around Diego Garcia. The territory contains some large reefs and, to date, the marine environment remains largely unexplored. The UK remains committed to implementing the United Nations Convention on the Law of the Sea (UNCLOS) Arbitral Award of 2015.

Strengthening governance

The Blue Belt Programme has been supporting the BIOT Administration to develop a draft Conservation Management Plan (CMP) building on the outcomes from a workshop held in March 2018. This sets out a strategic and risk based approach to conserve, protect and manage the unique environment of BIOT. The BIOT Administration are using this information to guide future conservation efforts to maintain and improve the natural environment.

"The BIOT Administration is grateful for the continued support from the Blue Belt Programme in helping us to tackle one of biggest environmental threats facing BIOT which is Illegal, Unregulated and Unreported (IUU) fishing. Our enforcement capacity has been enhanced through the use of satellite surveillance funded by Blue Belt and we have also benefitted from valuable scientific support through assessments of water quality to inform future management actions with the aim of providing the highest standards of environmental protection."

BIOT Administration



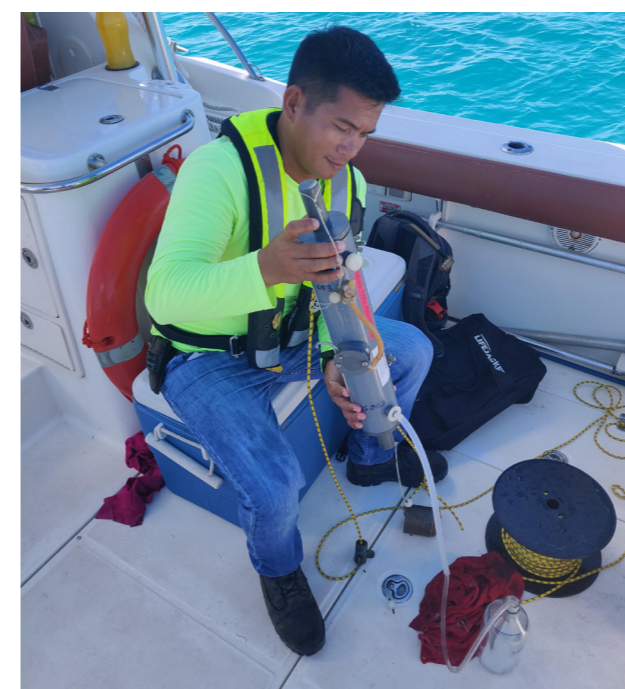
Blue Belt team were supported by the Royal Marines



A Blue Belt scientist preparing passive samplers

Managing the impacts of other human activities

Blue Belt Programme scientists worked with BIOT environment officers to survey the waters around Diego Garcia in March 2019. The team collected water samples within the lagoon and on the outer coasts of the atoll. The samples will be tested for heavy metals, nutrients, dissolved oxygen, turbidity and more. This information will contribute to a baseline dataset that will help the BIOT Administration manage the water quality within the lagoon and around Diego Garcia.

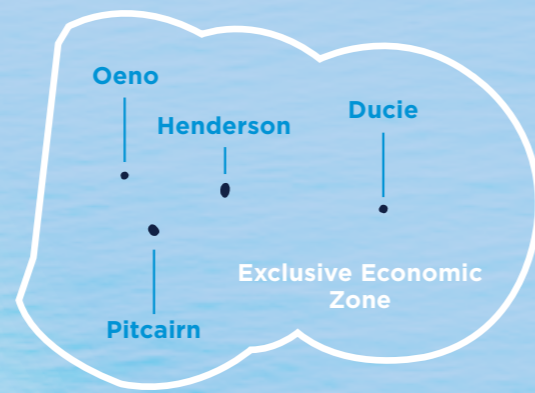


The Blue Belt Programme worked with BIOT support staff during the survey

Work Plans 2019–2020

- Work with BIOT Administration to implement high-priority conservation management measures
- Work with the Maritime and Coastguard Agency to provide advice on a marine pollution response plan using vessel movement data to highlight areas of high collision risk
- Process and report on the water samples collected in March 2019 and make recommendations on the future monitoring of the waters around Diego Garcia
- Work with the BIOT Administration and other stakeholders to develop data management strategies for the territory

Pitcairn Islands



Whitebar Surgeon fish in Pitcairn waters



The Pitcairn Islands are an isolated archipelago located in the South Pacific and are made up of four islands with only one being inhabited. The Pitcairn Exclusive Economic Zone (EEZ) covers an area of 834,000 km² and was declared a no-take Marine Protected Area (MPA) in 2016. Artisanal fishing rights are still held by the small island population of 45 to 50 residents within 12 nautical miles of the islands and within a specified area between Pitcairn (the inhabited island) and the nearby '40 Mile Reef'.



Blue Belt Programme's Emily Hardman briefing the Pitcairn Island Council



A hermit crab on Pitcairn Island

Strengthening governance

Although the Pitcairn Islands designated their MPA in 2016, the requisite legislation has not been put in place. The Blue Belt Programme has provided advice on the drafting of new Marine Conservation Regulations to ensure effective management of the MPA.

The Blue Belt Programme has also supported the development of a MPA management plan and provided training for local staff on MPA management planning.



The Blue Belt programme made recommendations for a code of conduct for whale watching

Managing other human activities

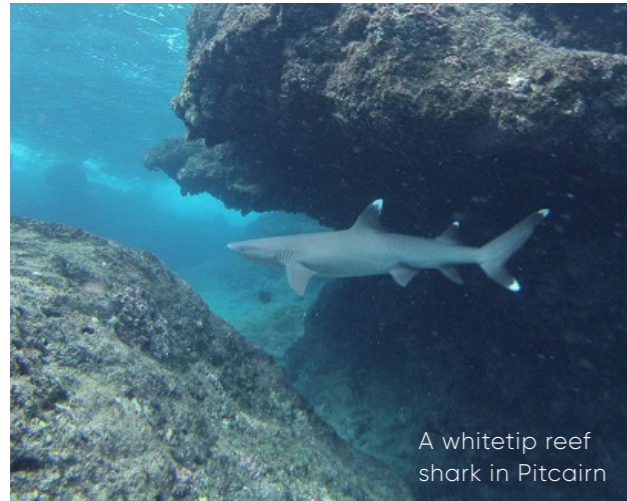
In recent years, there has been growing interest from the local community in providing whale watching trips for tourists to see the humpback whales between May and October. The Blue Belt Programme undertook a review of activity after the government of the Pitcairn Islands flagged a specific need for support. The team reviewed best practice around the world and developed a code of conduct and guidance for whale watching in the Pitcairn Islands. These have been provided as hard copies on island and on the Pitcairn Islands tourism website. Later this year training will be provided for boat operators and other members of the local community to ensure that the code of conduct is effectively implemented.

Supporting compliance and enforcement

Surveillance of the Pitcairn MPA has indicated that the threat of Illegal, Unreported and Unregulated (IUU) fishing is low, however it is necessary to provide appropriate enforcement training in case any illegal activity is detected. The Blue Belt team have conducted training with local staff on intelligence recording to help identify any illegal fishing within the MPA and guidance on evidence gathering to support a prosecution if appropriate.



The Blue Belt Programme's Emily Hardman during a workshop in Pitcairn, August 2018



A whitetip reef shark in Pitcairn

Understanding and protecting biodiversity

High resolution satellite data covering Pitcairn has been acquired to support future habitat surveys. The satellite images show distinct differences in the seabed around the island, which will be further explored using underwater video and stills images in 2019-2020 to create a comprehensive habitat map. Together with bathymetry data collected from around the island, the information will be collated to identify areas of shallow or particularly sensitive habitats where anchoring or other seabed activities should be carefully managed.

“The Blue Belt Programme has been extremely valuable for the Pitcairn Islands. I hope that this type of programme continues in the future bring areas of expertise together for the benefit of all UK Overseas Territories.”

Michele Christian, Government of Pitcairn Islands

Work Plans 2019-2020

- Finalise the Marine Protected Area (MPA) management plan, working with the Island Council and stakeholders
- Process data from the underwater camera survey to potentially identify sensitive habitats where anchoring or other seabed activities should be prohibited
- Work collaboratively with Government of the Pitcairn Islands and Pew Charitable Trusts to investigate plastics waste on Henderson Island following on from the joint funded Henderson Expedition
- Support the Government of the Pitcairn Islands to design and implement a monitoring programme for important species and habitats and to assess the effectiveness of the MPA
- Train local staff and community members in marine ecology and fisheries
- Provide training for boat operators and other members of the local community to ensure that the whale watching code of conduct is effectively implemented

St Helena



Masked booby bird in St Helena

St Helena is an isolated island in the tropical South Atlantic, surrounded by a 445,000 km² Exclusive Economic Zone (EEZ), which includes 17 known seamounts. The St Helena Government (SHG) declared a sustainable use MPA in the entire EEZ in September 2016. The Blue Belt Programme is working with the SHG to fully implement the MPA by ensuring the necessary legislation is in place, gathering scientific data on the marine environment, supporting sustainable management of fisheries and other human activities, building local capacity, and improving compliance and enforcement.

Strengthening governance

Although St Helena has designated a sustainable use MPA, the Fisheries Limits Ordinance (FLO) needs revision to fully implement the commitments made in the marine management plan. The Blue Belt Programme has assisted SHG with this work

and funded an on-island legal draftsman post to develop the new Fisheries Ordinance.

Understanding and protecting biodiversity

There is limited information available on the biodiversity of the St Helena marine environment, particularly offshore species and habitats, such as the seamounts. The Blue Belt Programme collected biological, physical and chemical data in the St Helena EEZ during research surveys on James Clark Ross in 2018 and more recently during the Discovery 100. Work is continuing to analyse samples and data collected during these research surveys.



A viper fish collected during Discovery 100

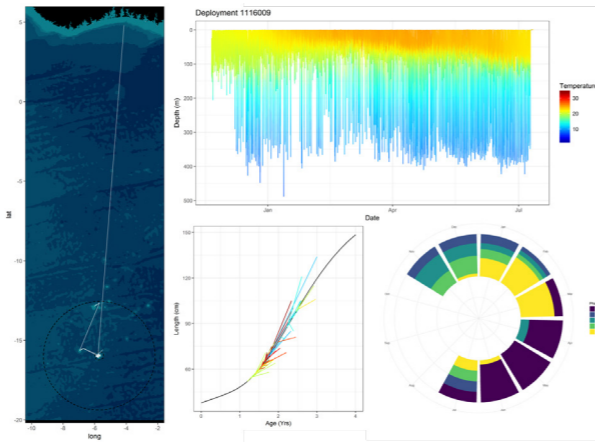
Supporting sustainable fisheries management

St Helena has three principal fisheries: a pole and line tuna fishery, an inshore fishery for grouper and an inshore fishery for spiny and stump lobster. The Blue Belt Programme has undertaken a review of St Helena fisheries to help develop the fisheries policy and future management.

Yellowfin and bigeye tuna are the main target species of the tuna fishery, with skipjack caught seasonally. These tuna stocks are migratory and managed on a pan-Atlantic basis by the International Commission for the Conservation of Atlantic Tunas (ICCAT). St Helena, with the help of the Blue Belt Programme, is now providing valuable scientific data to support this management. Working with the St Helena Government (SHG) and Stanford University, the existing Blue Belt Programme tuna tagging programme has been closely aligned with the ICCAT tagging programme, with over 3,000 tuna and wahoo tagged since December 2015. The results indicate that whilst St Helena's yellowfin tuna have links with fishing grounds off the Ivory Coast, they remain within St Helena waters for extended periods to feed and grow. To help address the question of retention, the team have recently deployed inshore and seamount acoustic listening stations to help monitor fish movements.



Blue Belt's Serena Wright working with local fishermen to tag a tuna



The tuna tags provide data on temperature, pressure, light, movement and tuna growth

Training is a major focus of the tuna tagging programme. Local staff and fisherman have been taught how to tag and effectively document tuna releases and recaptures around St Helena. Without the support and knowledge of the local community the tagging programme would not be possible. The Blue Belt Programme continues to work with the SHG to enhance their fisheries and data management collection, ensuring they meet requirements under ICCAT.

In the case of grouper and lobster there is little or no data on stock sustainability. In close co-operation with the SHG Marine Section team, the Blue Belt Programme has established packages of scientific work to assess the status of grouper stocks. This includes tagging, age determination and reproductive ecology work, with the tagging undertaken by local staff trained and funded by the Blue Belt Programme. A comprehensive review has been conducted to detail the current understanding of the species, which will feed into the design of monitoring and assessment studies.



Managing other human activities

In addition to fishing, other human activities occur in the St Helena Exclusive Economic Zone (EEZ) that could influence the marine environment. These include waste water discharges, sand extraction and marine tourism.

In 2018-2019, the Blue Belt team reviewed the risks to the marine environment of these activities to help SHG understand the potential effects on the MPA. The team also reviewed the existing legislation, regulatory and management frameworks in place and made recommendations on how these activities could be effectively managed to ensure that they are compatible with the marine management plan.

The team is now working with the SHG to develop management strategies based on these recommendations and to provide advice on the establishment and implementation of these new systems. The Blue Belt Programme has been supporting the SHG with revisions to the Environmental Policy for Marine Species Interaction Activities and the Marine Tour Operator Environmental Accreditation Scheme. These initiatives aim to minimise the negative influence of human activities on marine megafauna such as whale sharks and humpback whales.

Supporting compliance and enforcement

The Blue Belt Programme has provided funding for a Marine Enforcement Officer on St Helena to support the implementation of the new fisheries ordinance and the environmental protection ordinance. The officer will also carry out training on the island and work alongside a local officer to build capacity and ensure effective compliance continues in the long term.

The local community raised concerns about potential illegal unregulated unreported fishing activity. The intelligence hub at the National Maritime Intelligence Centre established special contact channels for the local St Helena fishing community to report any suspicious activities to enable the team to cross-reference reported intelligence with satellite and other data.



James Bay, St Helena

Building capacity

The Blue Belt Programme is funding the new laboratory development in St Helena to enable safe and effective marine science studies and monitoring on the island. This facility will be developed in conjunction with a marine visitor centre funded by the Blue Marine Foundation and managed by St Helena National Trust. The SHG hopes this new laboratory will be a centre for excellence and southern ocean hub for marine science.

The Blue Belt Programme were delighted to appoint a Blue Belt Coordinator on St Helena in December 2018. Elizabeth Clingham is a St Helenian with considerable experience of working in St Helena's marine environment and fisheries sectors. She is working closely with the Blue Belt Programme, the St Helena Government (SHG) and other stakeholders to help the programme achieve its objectives. In March 2019, Elizabeth, staff from the SHG Marine Section and the St Helena National Trust visited the Blue Belt team in the UK for a busy schedule of meetings and training.



A drawing of the new laboratory in St Helena, which the Blue Belt Programme is supporting



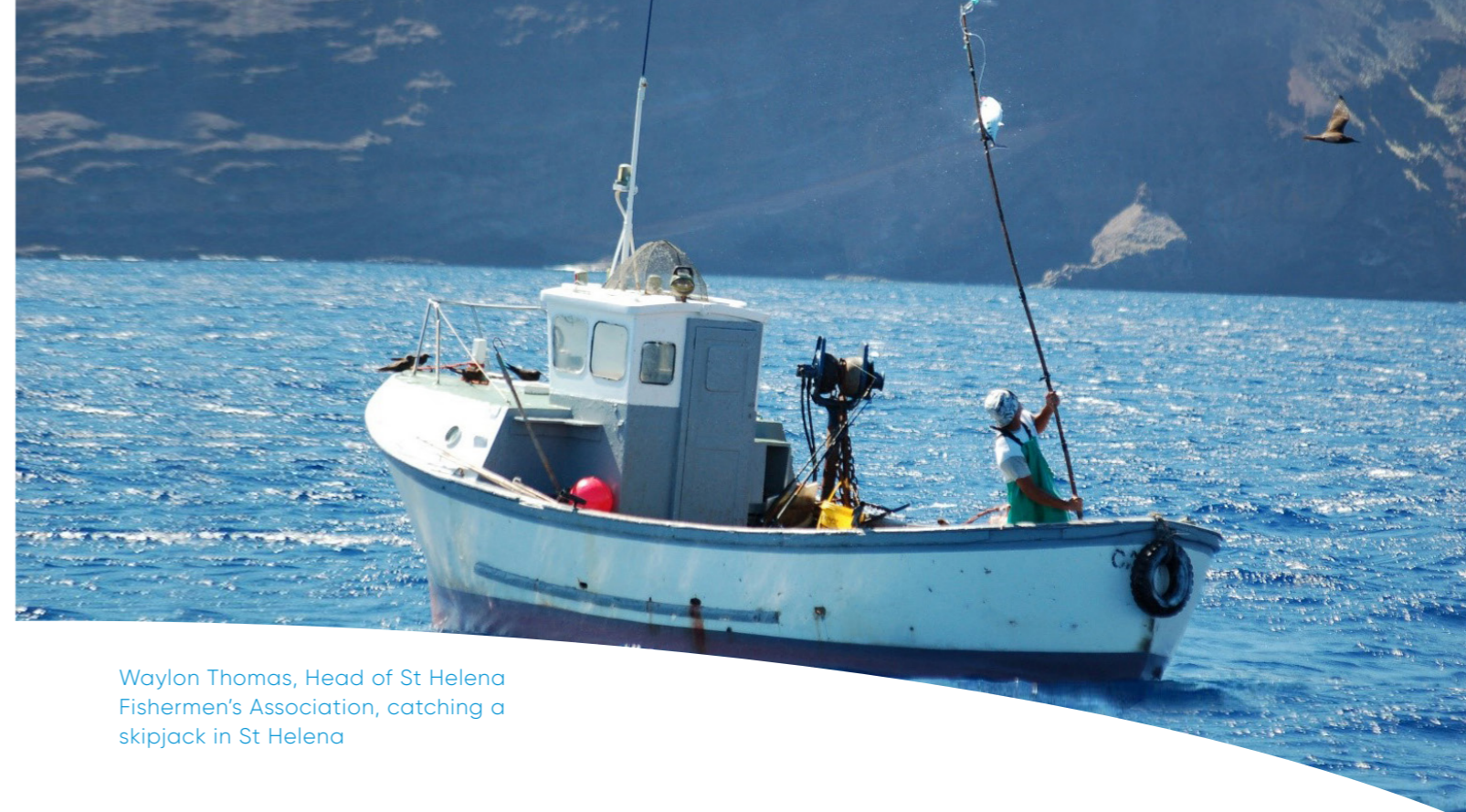
A whale shark in St Helena

"The Blue Belt programme has made a significant contribution to St Helena. It has enabled us to carry out new areas of research, which has furthered our understanding of the marine environment, and in turn has helped us to manage it better. It has given many Saints the opportunity to gain new skills and provided new equipment to enable them to utilise those skills. We are greatly looking forward to the development of the new laboratory, which will greatly improve the scientific research we are able to undertake on island."

Rhys Hobbs, Head of Marine Section, Environment and Natural Resources Directorate, St Helena Government

"Blue Belt has significantly raised the profile of the marine environment and its uses on island. The local community including fishermen and other stakeholders are always keen to know how things are progressing and continue to show immense support to the programme."

Elizabeth Clingham, St. Helena Blue Belt Manager, St Helena Government

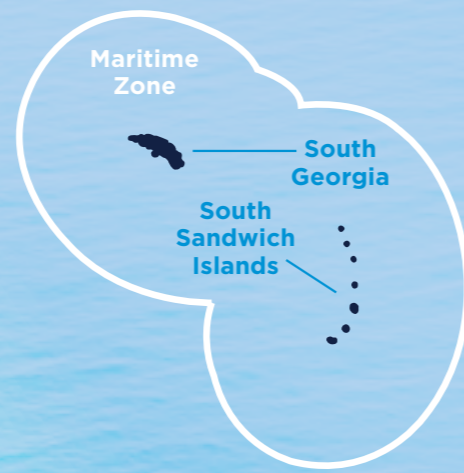


Waylon Thomas, Head of St Helena Fishermen's Association, catching a skipjack in St Helena

Work Plans 2019–2020

- Support the revision of the marine management plan to include new information policies and management strategies for the island's principal human activities
- Support development of new regulations under the Environmental Protection Ordinance for marine developments and commercial marine recreation within the Marine Protected Area (MPA) through the provision of additional drafting support
- Assist the development of the marine accreditation scheme for marine tourism operators on the island
- Provide reports to enhance our understanding of biodiversity of the marine environment and impacts of anthropogenic activities
- Support the SHG to update maps of the inshore habitats to better inform the marine management plan and underpin the assessment of sand extraction on the marine environment
- Process and analyse samples collected from Discovery 100 to characterise the marine environment
- Conduct inshore and offshore tuna tagging and analysis as part of the Blue Belt and International Commission for the Conservation of Atlantic Tunas (ICCAT) projects
- Work with SHG to build improved laboratory facilities and provide specialist training for SHG staff
- Work with SHG to develop fisheries legislation to allow effective management of their waters

South Georgia and the South Sandwich Islands



South Georgia and the South Sandwich Islands (SGSSI) are a sub-Antarctic archipelago in the Atlantic sector of the Southern Ocean. In 2012, 1.07 million km² of the Maritime Zone was declared a sustainable use Marine Protected Area (MPA), including no-take areas around all the islands and seasonal closures designed to protect SGSSI's exceptional wildlife. Further protective measures were put in place in 2018 after the first five-year review of the MPA. Sustainable fisheries for toothfish, icefish and krill, managed in accordance with the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), are internationally recognised as outstanding examples of ecosystem based fisheries management.

Strengthening governance

In 2017 and 2018, the Blue Belt Programme supported the Government of SGSSI during its first five-year review of the MPA. The review considered how the scientific understanding of the Maritime Zone had developed since the designation of the MPA and it assessed the effectiveness of current management and monitoring measures. The priorities for upcoming scientific research and monitoring were also considered, factoring in the evidence of ecosystem change and future threats such as climate change.

Based on the review and submissions from

stakeholders, the Government of SGSSI announced further enhancements to the MPA in 2018. These changes included extensions to the current no-take zones protecting 23% of the maritime area, temporal closures to protect breeding wildlife and further environmental protections such as a ban on the carriage of heavy fuel oils and a prohibition on commercial mineral and hydrocarbon extraction.

The Blue Belt Programme has also supported the Government of SGSSI in drafting and reviewing legislation updates and policy notes.



Understanding and protecting biodiversity

The MPA review highlighted an important information gap in the composition and distribution of benthic fauna and krill around the South Sandwich Islands. To address this, the Blue Belt Programme conducted a major survey on RRS Discovery around the islands, deploying a deep-water fibre optic camera system

and collecting benthic samples throughout the island chain. Further information on the survey is on page 25.



Supporting sustainable fisheries management

It is important to understand the potential influence of longline fishing on benthic fauna in SGSSI for future management considerations and as part of the Marine Stewardship Council certification. To improve our understanding of this interaction the Blue Belt Programme purchased miniature wildlife cameras, movement sensors, temperature loggers and four deep-water longline cameras.

The data loggers and cameras are deployed on benthic toothfish longlines during fishing operations at SGSSI.

So far, the equipment, and several other miniature cameras deployed by the UK fishing industry, have captured over 100 fishing operations. This novel approach to monitoring benthic interactions of fishing gear will provide important information on the impact of fishing operations, which will be used to advise the government of SGSSI over the coming year.

Supporting compliance and enforcement

The Blue Belt Programme has developed a formal procedure for gathering and recording information on fishing vessel

activities when undertaking aerial enforcement. This type of enforcement is critical for monitoring and enforcing vast maritime areas, supporting the fight against illegal, unreported and unregulated fishing.

"The marine environment of the SGSSI is critical to the territory's prosperity. It supports rich and diverse ecosystems that attract cruise ship visitors from around the world as well as sustaining a fishery that has been externally certified as being managed to the highest possible standards. Delivering world-class governance is a driving passion and the Blue Belt programme has directly supported our strategic aim of evidence-based environmental decision-making. This year's highlights include the introduction of significant enhancements to the SGSSI Marine Protected Area and support for two scientific research cruises to the South Sandwich Islands."

Nigel Phillips CBE, HM Commissioner for South Georgia and the South Sandwich Islands

Work Plans 2019–2020

- Report and advise on the findings of the Discovery 99 expedition investigating the South Sandwich Islands' benthic diversity
- Analyse the data collected by the longline deep-water cameras, miniature cameras and sensors
- Support planned updates to the Fisheries (Conservation & Management) Ordinance
- Continue satellite surveillance monitoring of risk areas and seasons

Tristan da Cunha



Tristan da Cunha is an isolated archipelago in the South Atlantic, comprising four islands and an Exclusive Economic Zone (EEZ) of 754,000 km². Tristan's waters are highly productive due to their location straddling the sub-tropical convergence and the presence of rich nutrient upwellings. As part of the Blue Belt Programme, the Tristan da Cunha government has committed to developing and implementing a marine protection strategy for its EEZ by 2020.

Strengthening governance

In July 2018, Blue Belt partners, stakeholders from the Foreign and Commonwealth Office, British Antarctic Survey and the Royal Society for the Protection of Birds attended workshops to develop management options for Tristan da Cunha. Since then the Blue Belt Programme has provided the Tristan Government and the Island Council with advice on potential management options and accompanying legal frameworks.

Understanding and protecting biodiversity

Initial analysis from the Blue Belt funded surveys (on the James Clark Ross in March 2018 and on the RRS Discovery in March–April 2019) suggests there are three biologically important ecosystems within the Tristan EEZ which should be considered within any marine protection strategy. These are the inshore ecosystems

around islands, the seamount ecosystems, and the offshore deep-water areas that constitute the majority of the EEZ. The main threats to these ecosystems come from the incidental bycatch of seabirds during longline fishing, the risk of marine pollution incidents from ship traffic and the damage caused to vulnerable marine ecosystems by unsustainable fishing methods.

In partnership with other organisations, the Blue Belt Programme is supporting Tristan Conservation Department staff to better understand the inshore marine biodiversity around the islands of the Tristan da Cunha archipelago. The team are using baited remote underwater video cameras to highlight seasonal differences in marine biodiversity around Tristan. Offshore, the focus has been on the Tristan seamounts that bisect the Tristan EEZ from north west to south east. There are four main seamounts that host vulnerable marine fauna, including deep-water coral and sponges, which in turn create important fish habitats.



The new Conservation R.I.B. used for inshore biodiversity monitoring, with the island of Tristan da Cunha in the background.



Rodney Green (Tristan Fishery Department), Iain Woolgar (Berthon Boat Company) and Bryan Goodsir-Thompson (Cefas) inspecting the Wave Dancer in Lymington during her refurbishment.

Supporting sustainable fisheries management

Currently, fisheries for lobster and bluenose warehou operate within the Tristan EEZ. The bluenose warehou fishery that operates on the seamounts has been a particular focus for the Blue Belt Programme. Preliminary advice on the management of the bluenose fishery was provided to help establish sustainable catch limits. The team also made recommendations to reduce the effect of fishing on the fragile benthic ecosystems associated with the seamounts.

This advice led Tristan Island Council to close the longline fishery for a season to protect foraging seabirds on the Tristan seamounts and enhanced fishing licence conditions to mitigate environmental effects in the immediate short-term.

The Blue Belt Programme is also developing a stock assessment for the bluenose and further evaluating the impacts of both longline and bottom trawl fishing. This is a high priority for Tristan da Cunha as fish that aggregate over seamounts, such as bluenose, can be overexploited rapidly and both longline and trawl fishing have impacts on the marine ecosystem.

The Marine Stewardship Council certified lobster fishery that operates around Tristan is conducted by Tristan island fishers using inshore boats. The FV Geo Searcher fishes the other three islands of the group. The British Antarctic Survey is leading a study on ocean currents to help understand lobster larval dispersal and settlement, and the Blue Belt Programme has provided advice on lobster handling for tagging studies. This will enable a tagging study led by the Tristan Fishery Department and supported by the RSPB through Darwin Plus funds.

A fisheries management plan will take these factors into consideration and underpin the marine protection strategy decided upon by the Island Council.

Managing the impacts of other human activities

The close passage of vessels to islands in the Tristan archipelago represents significant threat to Tristan waters. In 2011, the MV Oliva grounding and subsequent spill of oil, lubricants and soya bean cargo temporarily closed the lobster fishery and effected hundreds of northern rockhopper penguins. The team are helping the Tristan government to establish voluntary vessel traffic management scheme to reduce the risk of future incidents.

The Blue Belt Programme has commissioned a detailed analysis of shipping vessel hotspots and areas most at risk of ship collisions. This information will be used to declare a "voluntary area to avoid" so that vessels navigating through Tristan waters are aware of the fragile environment they are approaching and can adopt a safer course further away from the islands.

The team have provided guidance to Tristan da Cunha council and wider community on the options and implications of different marine protection

strategies. It was widely recognised that there is a need to balance the protection of Tristan's waters with the need to continue and manage human activity, specifically fishing, which is the backbone of the local economy.

Supporting compliance and enforcement

After being transported to the UK from Tristan da Cunha in 2018, the fishery patrol vessel Wave Dancer is undergoing a full Blue Belt funded refurbishment at Berthon Marine in Lymington. Rodney Green, Tristan Fishery Department Assistant Director and Wave Dancer coxswain, has visited the UK to participate in the refurbishment and receive training in all aspects of vessel maintenance so that the patrol vessel is kept in good condition once back on island. Whilst in the UK Rodney has also undertaken fisheries enforcement training and gained experience of at-sea inspections with the Royal Navy and Inshore Fisheries and Conservation Authorities.

Building capacity

Inshore marine monitoring by the Conservation Department has benefited from a replacement Rigid Inflatable Boat (R.I.B.) that Blue Belt provided as part of an infrastructure improvement project in 2018. The previous Conservation Department R.I.B. Arctic Tern was no longer serviceable after years of work in the dynamic waters around the island. Trevor Glass Director of Conservation was thrilled with the new R.I.B. and commented: "she's a real beauty, perfect for the conditions around Tristan and has so much space. She's excellent for our camera deployments and the new engines are so economical on fuel it makes a real difference."

"Tristan is still on track to declare its marine protection regime by 2020. Decisions by the Tristan community on the design will be informed by the science and evidence from many partners, including from the second Blue Belt funded research trip last March which took place on the RRS Discovery. In the last year the programme has funded training in the UK for islanders working on vessel maintenance, fisheries management and enforcement. We're also thankful to the Blue Belt for providing us with a new boat for conservation work, for funding local monitoring and tagging programmes and for the ongoing refurbishment of our fisheries patrol vessel."

Sean Burns, Administrator, Tristan da Cunha Island Council

Work Plans 2019–2020

- Use the evidence gathered on the RRS James Clark Ross and RRS Discovery to produce a marine biodiversity assessment for Tristan
- Finalise the first bluenose warehou stock assessment
- Develop a bluenose management plan for the seamounts
- Complete the refurbishment of the Wave Dancer patrol vessel
- Agree and develop a marine protection strategy for Tristan da Cunha
- Support the Island Council and the St Helena Attorney General to develop and enact legislation to underpin the marine protection strategy the Island Council decides to adopt
- Develop a ship traffic management scheme, including a voluntary area to avoid, to reduce the risk of emergency incidents

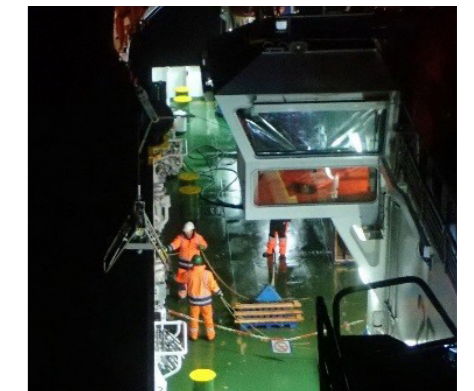
Discovery 99 to South Georgia and the South Sandwich Islands



The Blue Belt Programme team before the start of the expedition



Anemone captured using deep-water cameras near Montagu Bank



Lowering the deep-water cameras near Zavodovski Island

In 2012, the Government of South Georgia and the South Sandwich Islands (GSGSSI) declared a sustainable use Marine Protected Area (MPA) across over 1 million km² of the Scotia Sea within its maritime zone, which was further enhanced in 2019. The GSGSSI MPA monitoring and development requires scientific information that will describe the benthic ecological processes in several sites including the data poor area around the South Sandwich Islands.

The Blue Belt Programme chartered the RRS Discovery to undertake a scientific survey around the South Sandwich Islands in February - March 2019. The Discovery 99 survey examined the biodiversity and distribution of benthic species and their potential vulnerability to licensed longline research fisheries. The Blue Belt Programme worked with other academic research teams from the Universities of Essex,

Bristol and Oxford during the expedition.

Five islands across the active volcanic island system were selected for sampling. At each island the Blue Belt Programme's deep water camera system and benthic trawls were used to survey the species distribution and diversity on the seabed from 200 m to 2200 m.

In total, over 4,000 still images were acquired along with 30 hours of video. Benthic sampling provided a collection of more than 500 specimens, which were photographed, catalogued and preserved. The specimens will be donated to the Natural History Museum and be made available to the wider scientific community. The specimens will be used for future sub-Antarctic research studies.

The scientists completed 67 hours of marine mammal observations, covering 803

nautical miles, with 567 observations of 15 species recorded. The most frequent marine mammals were fur seals and humpback whales with sightings of hourglass dolphins, pilot, fin, sei, minke and beaked whales less common. The team also had a memorable close encounter with the magnificent blue whale.

Scientists are now beginning the process of analysing all the data to provide input to the GSGSSI MPA monitoring and management process. Research by the Blue Belt Programme will be focused on the data collected during the camera surveys. The findings from the survey will feed into several other projects at the Universities of Essex, Bristol and Oxford.

The data collected will be used to provide advice to the Government of South Georgia and the South Sandwich Islands on the effectiveness of current management measures.

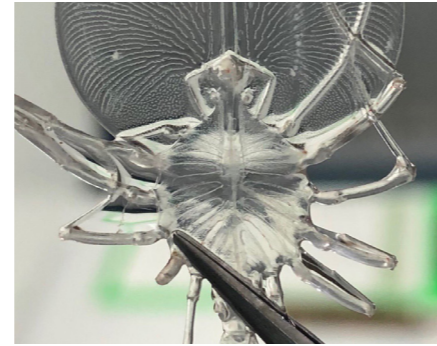
Discovery 100 to Tristan da Cunha and St Helena



There was a live stream to the expedition during two public outreach events at the Natural History Museum



A local team from Tristan da Cunha fisheries department joined the scientific team for part of the survey



A Tristan lobster larvae collected during the survey, one of 3,629 specimens collected in total

In March–April 2019, the Blue Belt Programme and the British Antarctic Survey (BAS) led a marine survey around Tristan da Cunha and St Helena. The survey, known as Discovery 100, took place on board the RRS Discovery and was a follow up to the 2018 survey on the RRS James Clark Ross. The aim of the survey was to improve understanding of the different marine ecosystems present within Tristan da Cunha and St Helena.

In the Tristan Exclusive Economic Zone (EEZ), work focused upon the seamounts, where deep-water fishing occurs. The team visited the McNish and RSA seamounts where recent fishing activity had taken place. The survey used a range of techniques including seafloor mapping, deployment of scientific mid water trawls and deep-water camera surveys. The aim of these activities was to understand the importance of the seamount habitats

for commercial species and determine the likely impacts of historic fishing.

After 11 days work in Tristan da Cunha waters the crew headed to St Helena for the second leg of science operations. Scientists and observers from both Tristan da Cunha and St Helena joined the surveys.

In St Helena the team's work focused on the importance of the island and seamounts for fisheries. They concentrated on mid-water ecosystems where tuna, the main commercial species of St Helena, live. The RRS Discovery surveyed the nearshore area around St Helena and the Bonaparte and Cardno seamounts. Scientists collected oceanographic and biological samples to try to understand the local food webs and environmental conditions favoured by tunas such as yellowfin and bigeye.

A wide range of exciting species were caught and

identified by Blue Belt Programme, BAS and Natural History Museum scientists. These included deep sea fish species such as the spook fish, slanes viper fish and inflated rat tails. A range of octopus and squid species were also caught, these included the cockeyed squid and the ghost octopus.

Seabed bathymetry was collected over the seamount complexes of both Tristan da Cunha and St Helena. The seabed images collected illustrated the shape and location of these habitats which have been shown to be biodiversity hotspots.

During the survey a total of 3629 specimens were identified and preserved. The Discovery 100 collection will now be housed in the Natural History Museum. The collection will be available to scientific specialists worldwide to undertake more detailed studies on the species caught during the survey.

Cross-territory management

Much of the work of the Blue Belt Programme can be applied across the UK Overseas Territories (UKOTs). The programme works in partnership with agencies, non-government organisations, local people and many others to help UKOTs develop, implement and enforce marine management strategies within their maritime zones.

Monitoring and enforcement: combatting illegal unregulated and unreported fishing

The Blue Belt Programme has developed an intelligence-led, risk-based approach to monitoring, control and surveillance around the Blue Belt UKOTs.

Intelligence

Intelligence is information about a potential offence that is assessed and reviewed. For example, information may be received about the sighting of fishing gear inside a UKOT Exclusive Economic Zone (EEZ). Officers from the MMO's Central Intelligence Team analyse, develop and disseminate intelligence around the UKOTs. This supports the work of MMO officers based in the National Maritime Information Centre (NMIC).

NMIC and the intelligence officer monitor the marine Automatic Identification System (AIS). In addition to AIS, a variety of different intelligence systems are used around the Blue Belt UKOTs, building up a near-real time analysis of risks to marine zones. Monitoring happens daily, ensuring suspicious activity is detected and investigated as soon as possible.

Risk

The Blue Belt Programme created baseline compliance risk profiles for each Blue Belt UKOT in 2017–18. Since then, the team has regularly refined the profiles. The risk profiles provide detail of the specific Illegal, Unreported and Unregulated Fishing (IUU) threats posed to each UKOT. The programme relies on the expert advice of the officers and fishermen in the UKOTs to anticipate where and when IUU fishing is likely to happen.

Based on new intelligence, the Blue Belt team refined the individual UKOT risk profiles. This year an extensive review was undertaken of satellite surveillance around each UKOT, specifically analysing spatial and temporal patterns of vessels picked up on satellite which have no AIS signal. Knowledge has been developed of important environmental, physical and anthropogenic factors that encourage IUU. This means the team can use surveillance assets, such as satellites, more efficiently. Additional mapping activities enabled the team to review spatial patterns in activity over different temporal scales.

Satellite surveillance

The Blue Belt Programme continues to develop an excellent collaborative relationship with OceanMind (Catapult). The team ran satellite surveillance and AIS monitoring operations over several UKOTs over the past year on a risk basis. The programme worked closely with European Maritime Safety Agency (EMSA) to develop a process to obtain satellite images over the UKOTs on a rapid-reactive basis.

During the surveillance operations conducted over 2018–19, the Blue Belt Programme facilitated live operational support to Ascension Island, St Helena, British Indian Ocean Territory (BIOT) and South Georgia and the South Sandwich Islands to support tasking of patrol vessels. In addition to supplying intelligence to suggest where contacts have been detected, the satellite surveillance was successful in validating instances where there have been no-risk contacts. Aligning the tasking of the patrol vessels with the positions of the satellite imagery led to further improvement in the efficiency of patrol vessels.

Over the past year satellite monitoring developed into an important tool to understand the threat of Illegal, Unreported and Unregulated Fishing (IUU) in the Blue Belt UK Overseas Territories (UKOTs). The monitoring generated some unexpected results, indicating the nature and extent of IUU is different to historic perceptions. This monitoring work demonstrated that whilst in some UKOTs the threat is higher than anticipated, for example in British Indian Ocean Territory (BIOT), in other UKOTs the illegal fishing risk is actually lower, for example, in St Helena.

Since 2018, the MMO has generated a total of 140 intelligence reports, from a range of sources including AIS, various satellite sources and third parties.

Satellite surveillance provides a sophisticated evidence base to allow the Blue Belt team to work with the UKOTs to address the threats. For example through domestic legislation and the Agreement on Port State Measures (PSMA), which is a binding international agreement specifically targeting IUU fishing.

Information is collated in a secure database then fed back into the risk profiling process.

World leading, innovative partnerships:

Working in partnership with OceanMind, the Blue Belt team have begun using Visible Infrared Imagery Radiometer Suite (VIIRS) sensors to detect light emissions at sea, as part of surveillance operations. The Blue Belt Programme has been working with

the National Oceanic and Atmospheric Administration on the application of VIIRS Boat Detection Tool. The Blue Belt team have coordinated trials, using alternative sensors to detect IUU vessel types and other remote sensors, placing the UK Government's Blue Belt Programme at the forefront of international IUU vessel detection.

The future

To support the UKOTs beyond the Blue Belt Programme, the team have worked in conjunction with computer software firm SCISYS Group to develop a prototype satellite surveillance tool. By 2020, the team will further develop the prototype to understand its operational capability. It is unlikely there will be a complete system for the UKOTs to use by 2020 but the team are working with other groups to take work forward beyond this date.



Photo credit: Three Wise Monkeys Productions
The Blue Belt Programme is working in collaboration with ZSL and the Bertarelli Foundation to trial long-range reconnaissance unmanned aerial vehicles for maritime surveillance.

Technology: adding value to compliance and enforcement around the UKOTs

The Blue Belt Programme is working in collaboration with the Zoological Society of London (ZSL) and the Bertarelli Foundation to trial long-range

reconnaissance unmanned aerial vehicles (UAVs) for maritime surveillance. The programme is hoping to expand UAV capability for compliance and enforcement purposes.

Testing highlighted both the potential that drones offer and the challenges associated with the application of technology for gathering evidence in UKOTs. The Blue Belt Programme is working with ZSL developing next steps for further testing and operational deployment.

In January 2019, the Blue Belt Programme hosted a 'Beyond the Blue Belt' technology event at ZSL attended by over 65 people. The event brought together experts from UKOTs, NGOs, academia, and the technology industry to share the technology work the team have been doing, and discuss fisheries compliance and enforcement for the UKOTs and future collaboration.

Feedback from the event will set out a 'roadmap' of opportunities in the short, medium and long term, as new technologies are expected to become available. It will review cross-cutting issues, such as processes for data management and intelligence sharing, alongside any new technology that might be deployed.

The Blue Belt team profiled meteorological conditions for each of the UKOTs, to inform the parameters within which any new technology trialled would need to operate – for example, changes in wind speed, wave height and temperature on a monthly basis.



Photo from the 'Beyond the Blue Belt' technology event at the Zoological Society of London

Regional Fisheries Management Organisations

Regional Fisheries Management Organisations (RFMOs), established under the United Nations Convention on the Law of the Sea (UNCLOS), are responsible for managing migratory, straddling or high seas stocks in the world's oceans. Engagement with RFMOs over the past year has contributed scientifically to the management of the stocks and, in some cases, protecting quota allocations.

The RFMOs have mechanisms to deal with issues of non-compliance by vessels flagged to member states and can blacklist vessels guilty of serious infringements of RFMO regulations.

Over the past year, the Blue Belt Programme established relationships with the compliance officers for all tuna RFMOs relevant to the Blue Belt UKOTs, representing an important conduit for support in investigating and addressing suspected IUU.

The Blue Belt Programme provided assistance and advice to support the UKOTs implementation of ICCAT requirements, including comprehensive reporting

requirements to support the management of ICCAT fisheries.

Contacts and networking

Following on from the extensive flag state (the state in which a vessel is registered) contact initially established in 2017-18, the Blue Belt Programme created and reaffirmed contact with various Fisheries Monitoring Centres (FMCs) of flag states. Recently, the team linked up with Interpol and started investigating mechanisms for applying Port State Measures Agreement (PSMA) to secure an inspection by the port state of a vessel of concern to the UKOTs.

In February 2019, the Blue Belt Programme presented at the Seafood and Fisheries Emerging Technology (SAFET) Conference and Global Fisheries Enforcement Training Workshop (GFETW) in Bangkok, Thailand. These events explored emerging technologies that could improve the conservation and management of world fishing, including in the UKOTs.

The Blue Belt Programme continued to explore routes for additional maritime and aerial surveillance, developing relationships with military contacts from the UK, Australia, New Zealand, USA, Canada and commercial partners.

The Blue Belt team worked with the Joint Nature Conservation Committee (JNCC) and the South Atlantic Environmental Research Institute (SAERI) on the 'South Atlantic Overseas Territories Natural Capital Assessment Project' in St Helena, Ascension and Tristan da Cunha.

JNCC has also undertaken a rapid assessment of the status

of corals in all of the UKOTs. The Blue Belt team is now working with JNCC to identify priorities for the Pitcairn Islands, which could support coral reef conservation in the territory.

Minimise and monitor the risk to the marine environment of invasive, non-native species

The Blue Belt Programme is collaborating with organisations who work in the UKOTs. Work continues with the GB Non-Native Species Secretariat on their Conflict, Stability and Security Fund (CSSF) project 'Tackling Invasive Non-Native Species in the UK Overseas Territories' which aims to improve the biosecurity of all UKOTs. The Blue Belt Programme has supported this work by reviewing the risks of marine invasive non-native species in St Helena, Tristan da Cunha, Ascension, Pitcairn and BIOT and will work in collaboration with the GB Non-Native Species Secretariat to develop UKOT-specific marine biosecurity management frameworks.

Support for development of marine emergency response plans

The Blue Belt team support the Maritime and Coastguard Agency (MCA) to understand UKOTs' capacity to respond to marine pollution emergencies. The Blue Belt team have undertaken initial assessments on the policies and procedures for pollution response and availability of equipment if needed in St Helena, Tristan da Cunha, Ascension, Pitcairn and BIOT.

Work Plans 2019–2020

- Delivery of legislation across the UK Overseas Territories (UKOTs) to support the implementation of marine protection strategies, including updates to existing ordinances and drafting enabling legislation and supporting regulations
- Delivery of bespoke UKOT technology roadmaps, looking at current and future technologies UKOTs may want to adopt or invest in to support the management of their marine waters
- Establishment of compliance and enforcement training resources to support UKOT fishery and enforcement officers including online training packages
- Development of biosecurity plans for each UKOT (as required). Build further links with other agencies (NNSS, JNCC) to deliver the work more efficiently
- Continuation of satellite surveillance, in line with threat profiling
- Implementing mechanisms for better engagement with other surveillance assets such as UK and other nations military/civilian capacity
- Routes and mechanisms in place for following up on Illegal, Unreported and Unregulated Fishing (IUU) through flag and port states



The work undertaken in 2018–19 has brought the UK closer to the target to protect over four million km² of ocean by 2020. The focus of the Blue Belt Programme is to help ensure that by 2020 UKOTs will have enhanced marine protection that is:

- **Designed** – based on the best available scientific knowledge and taking into account current and potential local marine use
- **Legally designated** – in accordance with domestic legislation
- **Effectively managed** – in accordance with comprehensive and locally agreed management plans which bring together scientific baseline information and include an analysis of current and future threats
- **Monitored** – on the basis of cost effective and sustainable plans to ensure the objectives of the designations are being delivered into the long term
- **Enforced** – through effective surveillance and enforcement strategies, on the basis of cost effective solutions to support UKOTs achieve this into the long term.

An important part of the programme will be working with the UKOTs to develop cost effective legacy arrangements for post-2020, recognising that managing, monitoring and enforcing large, remote marine areas is expensive and that many of the UKOTs have limited resources.

The Blue Belt Programme would like to thank all those involved in the production of the Annual Update for Financial Year 2018/19, including contributions from the UKOTs and the use of any third-party images.

For more information about the Blue Belt Programme:

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Blog: marinedevelopments.blog.gov.uk/category/blue-belt

Research: gov.uk/government/publications/the-blue-belt-programme

Cover image taken during the Henderson Expedition, credit: Luke Hosty, Protect Blue