



Department  
for Environment  
Food & Rural Affairs



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## Darwin Plus: Overseas Territories Environment and Climate Fund

### Final Report

**Important note** To be completed with reference to the Reporting Guidance Notes for Project Leaders: it is expected that this report will be a maximum of 20 pages in length, excluding annexes

### Darwin Project Information

Project reference	DPLUS039
Project title	Sustainable development and management of St. Helena's fisheries and marine tourism.
Territory(ies)	St Helena, South Atlantic
Contract holder Institution	Environment and Natural Resources Directorate, St Helena Government
Partner institutions	Plymouth University, South Atlantic Environmental Research Institute, Georgia Aquarium, Mote Marine Laboratory, Ascension Island Government Conservation Department (AIGCD),
Grant value	£461,359
Start/end date of project	April 2015 – June 2018
Project leader name	Mrs Elizabeth Clingham & Mr Gerald Benjamin
Project website/Twitter/blog etc.	Facebook pages: Sustainable development and management of St. Helena's fisheries and marine tourism, Nature conservation, St. Helena, Georgia Aquarium and St. Helena Government
Report author(s) and date	Mrs Elizabeth Clingham, Mr Gerald Benjamin, Mr Rhys Hobbs, Mrs Samantha Cherrett

## 1 Project Overview

St Helena is one of the most remote islands in the world. It is situated in the South Atlantic Ocean 1200 miles from Southern Africa and 1800 miles from South America.



The island’s economy is dependent of British Aid. Until October 2017 access to the island was only possible by ship, but St Helena has now completed construction of an airport to create easier access to the island to help support economic development. It was expected that the airport would have opened during the course of the project be operational but it was delayed due to technical issues. Two important sectors in the island’s long-term goal of self-sufficiency are marine tourism and commercial fishing. The island has long been protected by its isolation, and if development is not adequately informed and managed the islands relatively pristine environment is in jeopardy of being impacted. This Darwin Project is ambitious and aims to achieve the development of monitoring tools, protocols and procedures to support the sustainable management of these two key economic sectors. It aims to fill data gaps that currently exist so that management decisions are made on evidence based advice appropriate to St Helena’s marine ecosystem, society, economic growth and changes that St Helena will be subjected to in the very near futures

## 2 Project Stakeholders/Partners

The final few months have seen the project become far more active in the delivery of “on the ground work”. Project staff worked one to one with fisherman on their boats, were regularly present at the fisheries cold store during collection of biological data, regularly assessing marine tour operators and undertaking tuna conventional and satellite tagging. Commercial and sports fisherman, marine tour operators, industry executives and SHG officials have supported our fisheries science and tagging programmes.

Financial year	total no. fishing trips inshore	number trips bio data recorded inshore	no. observer trips in total	observer trips inshore	observer trips offshore
2017/2018 (3 months)	313	80	34	34	0
Whole project	1621	335	97	90	7

*Table 1: shows the number of fishing trips undertaken by the industry for the year.*

This type of engagement with each stakeholder was specific to the needs of each segment of the marine and fisheries sectors and much of the engagement was on a one to one basis. The project and project staff were also instrumental in developing the island’s Fishing Sector Strategy for 2016-2025.

The local marine tourism community and tourist office have been fully on board with the continuation of the marine environment accreditation scheme, which has also now become part of the “norm” within the industry.

The fisheries community continued to provide challenges. However, most members of the fishing community accepted our weekly observer trips as part of the “norm” and we continued with our one to one engagement with the fisherman as above. Most interesting to note is how fisherman became engaged in the tagging programme, to the extent that they brought

recaptured tags in personally with their data and would not leave until they had all of the details of the fish when it was originally tagged.

Each project partner has delivered in their work areas as proposed. Despite the wide geographic spread of project partners communication has not been an issue. The various partners have added quality to the project outcomes to date and this has already significantly contributed to the long-term sustainable management of St Helena's Marine environment. We have also this year added additional partner support with Stanford University as per our approved change request of March 2017.

Previous annual reports outline work undertaken in the first two years of the project.

### **3 Project Achievements**

#### **3.1 Outputs**

Pre-project there was an absence of dedicated fisheries research & marine tourism management as the local capacity was limited to basic understanding in these areas due to our long history of isolation and lack of exposure to the impacts of development on the marine environment. This project has facilitated a transformation in our understanding of the importance of St Helena fisheries and tourism development towards a much more balanced perspective which is enabling a precautionary approach to be implemented in developments an acceptance of new monitoring measures.

#### **Capacity building - Marine Section staff trained as local fisheries observers (output 1) & Fisheries Science, management and observer outputs (outputs 2 – 5 & 8)**

The project continued to support the capacity building of the local staff through continuous use of skills acquired as previously reported. All work areas continued as planned. Our fisheries science consultant proved an invaluable asset in supporting local capacity and mentoring of staff. As predicted this type of support was the best for the island long-term capacity building. Martin Collins (Marecol Consultancy) (since Dec 2016) was no longer employed as a fisheries consultant but local staff have been able to continue with the collection of all of the project's data requirements. It was also unfortunate that we lost one staff member to overseas employment but this was expected in St Helena – nevertheless we managed to engage the services of a part-time employee to transfer those skill sets to and undertake those work areas which went very smoothly. It was hoped that this will translate into a fulltime SHG post by the end of the project.

To date we have collected 542 (398 tuna species, 120 bait species, 24 other species) otoliths, and assessed 1133 gonads (748 tuna species, 315 bait species, 70 other) from various tuna, bait and ground fish species. A visit to the Ascension Island Conservation fisheries laboratory was undertaken in August 2016.

The visit facilitated inter-island working relationships and shared use of their newly established fisheries lab facilities. Three local marine section staff processed all of the samples collected up to that point, were able to prepare all otoliths for reading and successfully conducted the histological analysis of gonads (it was pleasing to note that 100% of initial gonads assessments were verified through histology). The training St Helena staff received gave us working knowledge and understanding of all elements of how fisheries biological data/specimens are processed and analysed, reinforcing that our sample collection has been undertaken correctly. This was achieved through one to one mentorship of the local staff by the AIMS project team as part of DPLUS project 021. This creates a legacy for continued work in this area.

Our fisheries database is fully operational and is populated as soon as we are in receipt of data and verified accordingly. The database continues to be use and will facilitate long-term collection and analysis of fisheries data.

*Picture: Screenshot of fisheries database.*

Tuna tagging was extremely successful and in total 1034 tags were deployed. The Stanford University team arrived in September 2016 and successfully undertook satellite tagging of 12 tuna and the collection of tissue samples for isotope analysis.

During the course of the project (September 2016), the St Helena Marine Protected Area was established and project staff contributed to the Marine Management Plan, which was published in the St Helena Gazette. Project staff also helped develop the St Helena Fisheries Sector, which was approved in Jan 2017. A fisheries legislative review committee (representation included key stakeholders; local island council, head of ANRD, commercial fishermen, sports fishermen and local Attorney General) was established in May 2016 to review and update St Helena's fisheries related ordinances. A revised Fisheries Ordinance and associated Regulations were drafted to be consistent with the Marine Management Plan. As a result of stakeholder engagement, local fisherman are now more supportive of legislation changes and process aiding understanding and buy-in.

### **Reporting by observers of marine based tourism compliance and human interaction with marine species (Output 6)**

The marine environmental accreditation scheme continued and assessments were undertaken with each operator each month. Assessments are recorded via a checklist and written report and entered into a dedicated marine accreditation database. Operators demonstrated compliance thus far on tour operations however struggled to familiarise themselves with filling in and submitting logbooks. The Project Manager continued to represent marine based initiatives through participation in the island Tourism Development Committee. Our Marine environment accreditation scheme became the template for other accreditation initiatives on island. Under the Environmental Protection Ordinance the accreditation will be a mandatory component of a marine tour operator's licence.

*Picture: Screenshot from marine environmental accreditation scheme assessment database*

### **Establish comprehensive information regarding whale shark and cetaceans in St Helena's waters (including data on identification photos (eco ocean), biological data and tagging (whale sharks only) (Output 7)**

Since dedicated fieldwork began in January 2016 two satellite tags prematurely came off whale sharks as they exceeded the crush depth of tags. Live data tags continued to excite whale sharks followers, notably when one shark surfaced a few hundred metres from the Ascension coast. Acoustic receivers were recovered in May 2016 and has provided some evidence that whale sharks do indeed stay in St Helena waters longer that previously though. As a result of the work generated in year one we were able to get local support from Enterprise St Helena to undertake fieldwork in 2017.

To characterize the whale shark population at St Helena we used a range of techniques during two expeditions to the island in January 2015 and January 2016, including satellite and acoustic telemetry, laser photogrammetry, and computer aided photographic Identification. Results from the expeditions and past records in a SHG sightings database showed that the aggregation is seasonal and strongly focused in the summertime. It consisted of equal numbers of adult male and female whale sharks with an average body length of 9.5m. From 323 encounters, we identified 120 unique individuals during the expeditions, 88% of the total number of unique animals identified at St Helena to date (135). We tracked movements of a subset of animals at, around and away from the island using satellite and acoustic telemetry. The tagged whale sharks typically remained at the island from January to May and then dispersed away into the central Atlantic. We confirmed connectivity between St Helena and Ascension and also Nigeria in the Gulf of Guinea. One tag never reported via satellite but washed up on a beach in Brazil. At St Helena, all tagged animals dived daily and very consistently to maximum depths of around 600m. Away from the island the dives were much deeper; one animal dived beyond the maximum sensor depth of the tag (1,832m) eleven times, and to over 1,000m more than 40 times. The reason for these dives remains unknown. The animals spent about 40% of their time at the surface and around 25% of their time between 20 and 200m depth. The reason for the preference for that depth stratum is also unknown at this point. A preponderance of circumstantial evidence supports the idea that St Helena is a breeding ground for whale sharks, the only one known in the world. It is therefore a critical habitat for the species. An ecotourism code of conduct was put in place by SHG and, assuming the aggregation continues to be reliable year over year, it has tremendous potential to be a

jewel in the tourism crown for the people of St Helena and something that should be treasured and protected accordingly.

### **Marine ecosystem services assessment (Outputs 9 to 11)**

A full ecosystem service valuation has been completed for fisheries and marine tourism activities on St Helena. Fieldwork undertaken in March/April 2016 included a short residency of Plymouth University staff with the Environmental Management Division, a stakeholder workshop and meetings with key representatives to access data sources and build capacity for ecosystem service assessments.

An ecosystem service valuation report was written. This included a quantitative and qualitative valuation of indicators of the social and economic benefits associated with fisheries and tourism activities and assessment against long term trends in the data (where appropriate).

Guidelines to Support the Future Application of Social and Economic Assessment Methods to Inform Marine Management and Planning was developed for St Helena.

Capacity building materials have been developed to share key findings with St Helena Stakeholders through a series of planned webinars in June 2017.

An academic paper for peer review has been written based on the marine ecosystem services assessment for St Helena to present a transferable framework to determine the exposure of ecosystem service benefits to risk of loss (risk exposure) to enable the integration of ecosystem service benefits into decision making for sustainability.

### **3.2 Outcome**

*Project Outcome: Three complimentary work programmes are essential for successful achievement of long-term strategic advances within St Helena's marine management.*

- *Outputs 1 to 5 will establish the local capacity to conduct fisheries science; facilitating the collection of the necessary data for comprehensive stock assessment contributing to a well-managed fishery.*
  - *A Fisheries Database (in MS Access) was developed and local staff trained to enter and extract data. The database is used to submit data to ICCAT and to facilitate data analysis.*
  - *Local staff are trained in fisheries data collection and the fisheries sampling and data collection has been maintained post-project.*
  - *A tuna tagging programme has been established and contributes to the pan-Atlantic tuna tagging programme. The Darwin Plus project has led to a much bigger tuna tagging programme, funded by ICCAT.*
  - *Manuals for data collection, tagging, the fisheries database were developed and continue to be used by the marine team.*
  - *Data from the project has been submitted to ICCAT and contributes to ICCAT's assessment of tuna stocks.*
- *Outputs 6 to 8 will ensure monitoring and compliance of established marine tourism management schemes. Research will be conducted on anthropogenic influences on the marine ecosystem from tourism activities.*
- *Outputs 9 to 11 will assess the ecosystem services and quantify the social and economic benefits associated with developing marine based industries to pre-empt potential risk and facilitate proactive management strategies.*

Based on this statement, we believe that the project outcome has largely been achieved and evidence provided during annual and final reports. A series of project activities have continued beyond the term of the funding period and continue to support marine conservation management.

### **3.3 Long-term strategic outcome(s)**

As outlined throughout this report, several activities and outputs have fed into legislation, policy and management strategies for St Helena and helped address UK Government's Blue Belt priorities (announced during the course of the project). In particular the project has:

- (i) Contributed to the designation of the St Helena Marine Protected Area and associated Marine Management Plan;
- (ii) Supported the development of the St Helena Fisheries Sector Strategy;
- (iii) Established a fisheries science programme, including data collection protocols & observer manuals;
- (iv) Established a tuna-tagging programme that contributes to local and regional (ICCAT) management of tuna stocks;

The project has built relationships both on island and overseas, which will help with future management and protection of the marine environment. Awareness of the impacts on and significance of protection of the marine environment has been raised across island. Some of the work undertaken has been incorporated into core work for marine conservation and continues to gather information to support marine management.

#### **4 Sustainability and Legacy**

Locally the project profile remained high. Within the local community the various schemes (tuna tagging, Whale Shark photo ID submissions, and marine accreditation) created much interest. St Helena's recent MPA designation and development of fisheries sector strategy have both endorsed the need for and commitment to the continuation of the work started as result of this project.

The marine section built stronger working relationships with the fishing industry as we were able to communicate the importance of science in the development of the sector. Many fishermen often see team members and ask for updates. The Marine tourism community accepted the Accreditation Scheme and is proud to be a part of it.

Most importantly the project outputs to date have given marine conservation and fisheries a stronger voice within the SHG and local political arena. The project outputs facilitated the development of four key members of staff in becoming confident and competent fisheries scientists. The establishment of the tuna tagging scheme has been a significant achievement. This programme links to similar initiatives in the Atlantic as a component of the International Commission for the Conservation of Atlantic Tunas tagging programme and will be maintained beyond the life of the project. Increased fisheries science activities added to the profile of St Helena fisheries product and is now been seen as a necessary tool to developing the industry sustainability. International organisations such as the International Pole & Line foundation have also recognised this and this has helped secure new projects to sell the unique St Helena's fisheries narrative and support the development of the sector.

See Link: <http://ipnlf.org/news/st-helena-to-establish-uks-first-one-by-one-only-tuna-fishery>

In July 2017, one staff member from marine conservation was seconded to the St Helena Fisheries Corporation to support the commercial sector activities where the profile of fisheries science and support was raised.

Recently, a webpage dedicated to Darwin Plus projects has been created on the St Helena Government site; <http://www.sainthelena.gov.sh/environment-and-natural-resources/>. Information for this project has been added: <http://www.sainthelena.gov.sh/dplus039-sustainable-development-and-management-of-st-helenas-fisheries-and-marine-tourism/>.

#### **5 Lessons learned**

Stakeholder engagement for a project of this nature must not be underestimated in small communities especially those like St Helena where exposure to environmental pressures on our marine and fisheries sectors are not always visible. This means acceptance or recognition of change is not always an easy message to convey as local stakeholders who tend to look at many issues in a local context rather than a global one and short term goals are often more appealing than long-term ones. Additionally it is local culture for knowledge of these sectors to be guarded closely by some, and local stakeholders who often are not receptive or open to anyone they perceive to be outside of their community. To that end we gave much of our time to help stakeholders understand what we were doing through the project and why we were undertaking the activities. Due to the nature of the work we were able to give the main stakeholders one to one information sessions and feedback. This required much change for

them, especially the fisherman – thankfully the working relations evolved and science has been accepted and co-operation was beneficial and enjoyed.

We also learnt that the original project proposal was over-ambitious and hence the change requests that were reported on in previous reports. In an effort keep our project application budget submission low we unintentionally set key project salaries too low to attract the right people to some of the project's job. In the fishing industry we found from our experience and feedback that it would appear professionals willing to share their practical experience are more readily accepted over academics as facilitators of change.

One of the key lessons also learnt during this project is the importance of training and capacity building visits early on in the project delivery for local staff, which helped to put the work in context creating a reference point and better networking.

Future projects from St Helena will most likely be higher in value to attract the right technical staff and appreciate the number of local staff requirements and that all projects from St Helena need a three month mobilisation phase (as a minimum).

Social media use from any SHG led project is limited by in house IT Policy. SHG computers are not allowed to use sites such as Facebook, Twitter and various blogs which makes social media submission sporadic as they are often done by project staff from home. In addition social media use on St. Helena is still in its infancy and will take time to become a key communication tool.

## **5.1 Monitoring and evaluation**

Financially the project is managed within the SHG financial regulations which allows for accurate management of accounts.

With the creation of the fisheries database and marine accreditation database, queries are run on a need basis and compared against set project targets to ensure that minimum data requirements have been met each month.

The original Darwin application was used as a reference document and regularly reviewed by the project manager to ensure an up to date status. Project status is also reviewed with senior ENRD management.

There has been no effort in this year in co-ordinating all project partners as one group but rather as groups appropriate to the work area that has needed to be undertaken. Project partners produced regular reports which have been provided here and in previous reports to Darwin.

## **5.2 Actions taken in response to annual report reviews**

The annual report (March 2017) asked about the management of the different partners contributions and how the project had delivered it's outcome. The contributions of the different partners was addressed by regular skype calls with each of the partners – as each partners role was discrete and, due to different time zones, teleconferences with all partners were not necessary. Each of the partners visited St Helena and project meetings and stakeholder meetings were held during those visits.

Details of how the project delivered against its planned outcome are detailed above.

## **6 Darwin Identity**

To date the project has had considerable local & international media coverage via newspaper articles and radio interviews and we have created a project specific Facebook page (<https://www.facebook.com/St-Helena-Fisheries-Marine-Tourism-Darwin-Project-1112109018861550/>) and the Georgia Aquarium regularly posted blogs etc. We also hosted our local marine awareness month during the month of March.

The Darwin logo has been used on all published material (posters, press releases, local TV educational videos, activity books) as well as in newspaper articles. When radio interviews

were given reference was always given to the work being funded by the Darwin Initiative. The project continues to be referred to as the Marine Darwin project locally, and the project vehicle is also referred to as the “Darwinator”.

Due to the small population of St Helena and outreach of the project a large percentage of people on island will be familiar with the Darwin Initiative from Government staff, councillors, the general public, school children and stakeholders for the project.

More specifically new work areas such as tuna tagging and whale shark photo ID submissions has required public participation for those that have contributed to our appeals. T-shirts and mugs bearing the Darwin logo and scheme logo have been offered as thank you gifts and often worn with pride by recipients.

Social media sites such as Facebook have been an avenue for posting any of the above publications (see Facebook pages: Nature conservation, St. Helena, Georgia Aquarium and St. Helena Government).

## 7 Finance and administration

### 7.1 Project expenditure

Project spend (indicative since last annual report	2017/18 Grant (£)	2017/18 Total actual Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Others				
<b>TOTAL</b>				

Staff employed (Name and position)	Cost (£)
<b>TOTAL</b>	

Consultancy – description of breakdown of costs	Other items – cost (£)



<b>TOTAL</b>	0
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<b>Capital items – description</b>	<b>Capital items – cost (£)</b>
<b>TOTAL</b>	0

<b>Other items – description</b>	<b>Other items – cost (£)</b>
<b>TOTAL</b>	

## 7.2 Additional funds or in-kind contributions secured

<b>Source of funding for project lifetime</b>	<b>Total (£)</b>
SHG in-kinds (project staff, management time, lab time and overheads)	
SAERI in-kinds	
AIG in-kinds	
Georgia Aquarium in-kinds	
MOTE in-kinds	
Plymouth University in-kinds	
<b>TOTAL</b>	

<b>Source of funding for additional work after project lifetime</b>	<b>Total (£)</b>
<b>TOTAL</b>	

## 7.3 Value for Money

This project offers value for money as it is already aiding core work and other current Darwin Plus, other funded projects and proposed projects by providing baseline data (e.g. for the Blue Belt Programme), equipment and tools for marine and fisheries science.

The project training and capacity building has been invaluable for staff and local stakeholders. Our project partners understand St Helena and therefore any future similar work, or work that could build on this information, can be done without starting from nothing, and without needing to take time to familiarise an organisation with St Helena's unique constraints and challenges.

The project also offers value for money as it covered many areas of marine related work on St Helena. The visual presence on the project in the marine community was an unexpected bonus and raised awareness across St Helena.

## Annex 1 Project's original (or most recently approved) logframe (if your project has a logframe), including indicators, means of verification and assumptions.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
<p><b>Impact:</b>            The project will deliver a baseline for assessing economic and social changes in the marine environment firmly set on a science foundation needed for effective fisheries and marine tourism management. Fishing is an important recreational and commercial activity on St. Helena, so evidence-based decision-making will contribute significantly towards sustainable local economic development.            The project will establish St. Helena's fisheries science and stock assessment framework and build on marine tourism management. It will leave a significant legacy in terms of local capacity, data management systems and national governance to be sustained long after the project.</p>			
<p><b>Outcome:</b>            Three complimentary work programmes are essential for successful achievement of long-term strategic advances within St Helena's marine management. Outputs 1 to 5 will establish the local capacity to conduct fisheries science; facilitating the collection of the necessary data for comprehensive stock assessment contributing to a well-managed fishery.            Outputs 6 to 8 will ensure monitoring and compliance of established marine tourism management schemes.            Research will be conducted on anthropogenic influences on the marine ecosystem from tourism activities.            Outputs 9 to 11 will assess the ecosystem services and quantify the social and economic benefits associated with developing marine based industries to pre-empt potential risk and facilitate proactive management strategies.</p>	Please see details below	Please see details below	Please see details below
<p><b>Output 1</b>            Capacity building - Marine section staff trained as local fisheries observers.</p>	Fisheries scientist appointed. Minimum of 2 local project staff trained by AIG and Falkland Fisheries as observers and in fisheries data and sample collection.	Fisheries consultant contract completed and signed.  Visit to Falkland Island Fisheries undertaken	With new project partners introduced this year; Stanford University and CEFAS local capacity will continue to be enhanced and developed. The local marine team have now been trained in the fisheries data collection, tagging, and as fisheries observers.
<p><b>Output 2</b>            Assessment of inshore and offshore commercial fisheries</p>	Data mining activity completed.	As above.	Logbook submissions from inshore vessels is still and outstanding

<p>undertaken.</p>	<p>Observer database, log book and protocols set up and in place. Observer presence on all local inshore commercial vessels 4 days/month Observer presence on all offshore vessels 1 day/month Database set up and populated. Stock assessment and fisheries management plan produced.</p>	<p>As above: Logbook template produced and issued to fisherman. Protocol set out in “St. Helena fisheries sampling protocol”  As above.  As above. Protocol set out in “St. Helena fisheries sampling protocol”  As above. Fisheries sector strategy completed see link :<a href="http://www.sainthelena.gov.sh/wp-content/uploads/2012/08/St-Helena-Fisheries-Strategy.pdf">http://www.sainthelena.gov.sh/wp-content/uploads/2012/08/St-Helena-Fisheries-Strategy.pdf</a></p>	<p>issue. However, with the development of the fisheries industry under the Fisheries Sector Strategy and a new reporting licensing requirement proposed under the new Fisheries Ordinance it is hoped that more effort can be focused on this issue to encourage logbook entry and submission.  Fisheries Sector Strategy has been endorsed by SHG which set the bases for continuous development of these work areas.</p>
<p><b>Output 3</b> Age growth and reproductive biology of bait and commercial fish species is significantly advanced.</p>	<p>At least 600 otoliths collected in preparation for sectioning, processing, validation and reading 50 gonad samples will be processed for histological examination. To investigate methods to establish growth curves, annual reproductive cycles and age-at-maturity of tuna and bait species.</p>	<p>As above</p>	<p>Otoliths were collected from tuna, grouper and bait species and St Helena staff trained in preparation and reading of otoliths. Reading tuna otoliths is difficult and tuna growth has been estimated from tagging and length frequency data.</p>
<p><b>Output 4</b> By catch risk assessments for seabirds, turtles and sharks in commercial fishing fleet are established.</p>	<p>Observer deployed on fishing vessels. SHG observer receives seabird data collection training from FIG Geospatial analysis of seabird tracking data in conjunction with catch data are conducted to examine potential overlaps. Different fishing methods</p>	<p>As above</p>	<p>The observer programme demonstrated that the pole &amp; line fishery has minimal impact on non-target species. The Marine Management Plan demands 100% observer coverage of any long lining fishing, but there is none currently happening.  Datasets compiled and the necessary data layers will be collated to undertake geospatial</p>

	assessed for by catch levels by observer monitoring.		analysis
<b>Output 5</b> A fisheries management plan for management and on- going monitoring of St. Helena's fishery is developed and implemented	Report produced detailing methodology and management strategies for St Helena fishery. All standard at sea recording forms produced and filed in specific folder.	As above. Fisheries sector strategy completed see link <a href="http://www.sainthelena.gov.sh/wp-content/uploads/2012/08/St-Helena-Fisheries-Strategy.pdf">:http://www.sainthelena.gov.sh/wp-content/uploads/2012/08/St-Helena-Fisheries-Strategy.pdf</a> As Above. Protocol set out in "St. Helena fisheries sampling protocol data sheet etc"	Fisheries Sector Strategy endorsed by SHG showing commitment St. Helena has to developing St. Helena fisheries and fisheries science programs. St. Helena's recent MPA declaration, Marine Management Plan adoption and the support expected from the Blue Belt Initiative further supports ongoing monitoring.
<b>Output 6</b> Reporting by observer of marine based tourism compliance and human interaction with marine species.	1 x local observer appointed. Local observer training in data collection. Each local operator is observed 3 times per season during whale shark tours Each local operator is observed 4 times per year during sports fishing tours Each local operator is observed once each month during dive operation tours. Each local operator is observed twice a year during cetacean tours.	As above.	This work area has already been integrated into recurrent work areas for the marine section.
<b>Output 7</b> Establish comprehensive information system regarding whale shark and cetaceans in St. Helena's waters (including data on identification photos (eco ocean now wildbook), biological data and tagging (whale sharks only)	60 days dedicated to collection of whale shark data during peak season. Successful deployment of 8 satellite tags on whale sharks. Collection of 8 genetic tissue samples Local promotion of photo identification pictures from	Completed. With the support of project partners we actually deployed 30 satellite tags. We also installed a small acoustic array and have deployed 20 Acoustic tags	Georgia Aquarium will conducted analysis of all data collected and a formal report produced of all data findings and production of educational material.

	tourists/locals of whale sharks and cetaceans Collation, analysis and management of photo records (including submission to ECO-OCEAN – see <a href="http://www.whaleshark.org">www.whaleshark.org</a> ) Educational video produced		
<b>Output 8</b> Deployment of mechanical & PSAT tags on marlin and tuna	12 tags deployed	Completed.	Analysis of the PSAT tag and conventional tags has provided new insights into yellowfin tuna behaviour and ecology. Most notably the work has shown extended residency of tuna around the island.
<b>Output 9</b> Application of marine ecosystem services assessment (incl. social and economic benefits)	Delivery of an ecosystem services assessment, including an estimate of the social and economic benefits derived from the ecosystem services.	Completed.	
<b>Output 10</b> Development and application of future marine management scenarios	Management measures that protect ecosystem function whilst generating enhanced social and economic benefits are identified.	Completed.	Key management measures were incorporated into the Marine Management Plan and in the Fisheries Sector Strategy.
<b>Output 11</b> Marine Ecosystem Service Assessment and Marine Planning capacity building programme	A minimum of 10 people trained in ecosystem service assessment to support marine planning and management.	Completed.	The delivery of the capacity building programme focused on marine ecosystem service assessment delivered via webinars
<b>Activities</b> 1.1 Appointment of fisheries scientist 1.2 Appointment of marine tourism observer (local post) 1.3 Training of local project staff in fisheries observer programs, data collection gonad staging and otolith collection, preparation and reading by FIG and AIG. 2.1 Collate and review all fisheries data, including catch and effort data, and any biological or environmental data available for both inshore and offshore catches. 2.2 Establish observer database, produce observer manual 2.3 Review offshore logbooks			

- 2.4 Observer presence on inshore, offshore and sports fishing vessels
- 2.5 Development of predictive models to attempt to explain patterns of distribution and abundance
- 2.6 Deployment of at least 500 mechanical tags and 16 PAT tags on pelagic fish (tuna and marlin) from sport fishing and offshore commercial vessels.
- 2.7 Fisheries management plan produced. Licensing conditions updated where appropriate
- 2.8 Age growth and reproductive biology of main inshore and offshore commercial fish species is significantly advanced.
- 3.1 At least 600 otoliths sectioned, processed, validated and read
- 3.2 At least 600 gonads, assessed for reproductive status. A subsample (50) fixed stained and sectioned. Condition and gonad indices analysed
- 3.3 By catch risk assessments for seabirds, turtles and sharks in commercial fishing fleet are established.
- 4.1 Observer training in seabird data collection
- 4.2 Geospatial analysis of seabird tracking data in conjunction with catch data are conducted to examine potential overlaps
- 4.3 Different fishing methods assessed for by catch levels by observer monitoring.
- 4.4 Section on bycatch (and any necessary mitigation methods) included within fisheries management report. Licensing criteria updated where appropriate.
- 5.1 Plan produced detailing methodology and management strategies for St Helena fishery. Licensing conditions updated where appropriate
- 5.2 Folder exists containing all data recording forms
- 6.1 Marine observer trained.
- 6.2 Assessment of each marine tourism operator (sports fishing, diving, whale shark tours and cetacean trips) conducted with report on compliance and including analysis of data collected.
- 7.1 Deployment of 8 PAT tags on whale sharks.
- 7.2 Collection of biological & photographic data of all whale sharks seen (size, sex, T-zone) and submission to Eco-ocean
- 7.3 Tag data retrieved and analysed by experts. Scientific publication produced
- 7.4 Species action plan created for whale shark.
- 7.5 Cetacean photo records collated and analysed
- 8.1 Tag data retrieved and analysed. Scientific publication produced
- 8.2 Species action plan created for marlin.
- 9.1 Ecosystem services assessment focused on fisheries and tourism activities.
- 9.2 Report describing the methods and results of the ecosystem services assessment, including an assessment of social and economic benefits associated with fisheries and tourism activities.
- 10.1 Local stakeholder workshops to develop realistic scenarios to test the application of a range of plausible future marine management measures.
- 10.2 Recommendations for future marine management measures to protect the marine ecosystem whilst supporting the realisation of social and economic benefits.
- 11.1 Written guidelines to support the future application of social and economic assessment methods to inform marine management and planning
- 11.2 Development of a tailored capacity building programme focused on marine ecosystem service assessment to inform marine management and planning.

## Annex 2 Report of progress and achievements against final project logframe for the life of the project

Project summary	Measurable Indicators	Progress and Achievements for the life of the project
<p>Impact:</p> <p>The project will deliver a baseline for assessing economic and social changes in the marine environment firmly set on a science foundation needed for effective fisheries and marine tourism management. Fishing is an important recreational and commercial activity on St. Helena, so evidence-based decision-making will contribute significantly towards sustainable local economic development.</p> <p>The project will establish St. Helena's fisheries science and stock assessment framework and build on marine tourism management. It will leave a significant legacy in terms of local capacity, data management systems and national governance to be sustained long after the project.</p>		<p>This project has made a positive impact through contributing towards quantifying the impact on our marine biodiversity. We now have the management tools for monitoring the human impact on the marine environment to compare to the biological resources available and their use complimented by ecosystems services assessment which is evidence of the holistic management approach being taken.</p> <p>These tools and protocols are now in place and will be used to facilitate evidence based decision making with regards to management of our marine environment.</p> <p>The science data collected has already added value to St. Helena resources and stakeholder are on board with the management initiatives as a result. As evidence through this described throughout thus report and more specifically indicated in the columns and below.</p>
<p>Outcome</p> <p>Three complimentary work programmes are essential for successful achievement of long-term strategic advances within St Helena's marine management. Outputs 1 to 5 will establish the local capacity to conduct fisheries science; facilitating the collection of the necessary data for comprehensive stock assessment contributing to a well-managed fishery.</p> <p>Outputs 6 to 8 will ensure monitoring and compliance of established marine tourism management schemes. Research will be conducted on anthropogenic influences on the marine ecosystem from tourism activities.</p> <p>Outputs 9 to 11 will assess the ecosystem services and quantify the social and economic benefits associated with developing marine based industries to pre-empt potential risk and facilitate</p>	<p>Please see details below</p>	<p>Please see details below</p>

proactive management strategies.		
Output 1. Capacity building - Marine section staff trained as local fisheries observers.	<p>Fisheries Consultant appointed.</p> <p>Originally: Fisheries Scientist appointed – change request approved.</p> <p>Minimum of 2 local project staff trained by AIG and Falkland Fisheries as observers and in fisheries data and sample collection.</p>	Output completed.
Activity 1.1 Appointment of <i>consultant</i> (originally <i>fisheries scientist</i> – approved change request)		Completed.
Activity 1.2, Appointment of marine observer (local post).		Completed.
Activity 1.3, Training of local project staff in fisheries observer programs, data collection gonad staging and otolith collection, preparation and reading by FIG and AIG.		Completed.
Output 2. Assessment of inshore and offshore commercial fisheries undertaken.	<p>Data mining activity completed.</p> <p>Observer database, log book and protocols set up and in place.</p> <p>Observer presence on all local inshore commercial vessels 4days per month (originally 10 days/month – change request approved)</p> <p>Observer presence on all offshore vessels 1 trip per month (Originally 30% of time – change request approved)</p> <p>Database set up and populated.</p> <p>Stock assessment and fisheries management plan produced.</p>	Output completed.



Activity 2.1. Collate and review all fisheries data, including catch and effort data, and any biological or environmental data available for both inshore and offshore catches.	Completed.
Activity 2.2. Establish observer database, produce observer manual	Completed.
Activity 2.3. Review offshore logbooks	Completed.
Activity 2.4. Observer presence on inshore, offshore and sports fishing vessels	Completed.
Activity 2.5. Geospatial analysis of existing data	Completed.
Activity 2.6. Development of predictive models to attempt to explain patterns of distribution and abundance	Completed.
Activity 2.7. Deployment of at least 500 mechanical tags and 16 PAT tags on pelagic fish (tuna and marlin) from sport fishing and offshore commercial vessels.	Completed.
Activity 2.8. Fisheries management plan produced. Licensing conditions updated where appropriate	Completed.
<p>Output 3. 1. Age growth and reproductive biology of <i>bait</i>* and commercial fish species is significantly advanced.</p> <p>*originally <i>main inshore and offshore</i> – change request approved</p>	<p>At least 600 otoliths samples collected with related length weight and maturity data.</p> <p>50 gonad samples will be processed for histological examination.</p> <p><i>To investigate methods to establish growth curves, annual reproductive cycles and age-at maturity of at least 2 <b>baitfish</b> species established.*</i></p> <p><i>Originally: Growth curves, annual reproductive cycles and age-at maturity of at least 2 commercially exploited inshore fish species established. – change request approved</i></p>

<p>Activity 3.1 At least 600 otoliths collected <u>in preparation for sectioning, processing, validation and reading</u></p> <p>(Originally At least 600 otoliths <u>sectioned, processed, validated and read</u> – change request approved)</p>		Completed.
<p>Activity 3.2 At least 600 gonads, assessed for reproductive status. A subsample (50) fixed stained and sectioned. Condition and gonad indices analysed</p>		Completed.
<p>Activity 3.3 <u>To investigate methods to establish growth curves, annual reproductive cycles and age-at-maturity of tuna and bait species.*</u></p> <p><u>*Originally Establishment of growth curves, annual reproductive cycles and age-at-maturity for at least 2 commercially-exploited species – change request approved.</u></p>		Completed.
<p>Output 4. By catch risk assessments for seabirds, turtles and sharks in commercial fishing fleet are established.</p>	<p>Observer deployed on fishing vessels. SHG observer receives seabird data collection training from FIG</p> <p>Geospatial analysis of seabird tracking data in conjunction with catch data are conducted to examine potential overlaps.</p> <p>Different fishing methods assessed for by catch levels by observer monitoring.</p>	Output completed.
<p>Activity 4.1 Observer training in seabird data collection</p>		Completed.
<p>Activity 4.2, Geospatial analysis of seabird tracking data in conjunction with catch data are conducted to examine potential overlaps</p>		Completed.
<p>Activity 4.3, Different fishing methods assessed for by catch levels by observer monitoring.</p>		Completed.
<p>Activity 4.4 Section on bycatch (and any necessary mitigation methods) included within fisheries management report. Licensing criteria updated where appropriate</p>		Completed.
<p>Output 5. A fisheries management plan for management and on- going monitoring of St. Helena's fishery is developed and implemented.</p>	<p>Report produced detailing methodology and management strategies for St Helena fishery.</p> <p>All standard at sea recording forms produced and filed in specific folder.</p>	Output completed.

Activity 5.1 Plan produced detailing methodology and management strategies for St Helena fishery. Licensing conditions updated where appropriate		Completed.
Activity 5.2, Folder exists containing all data recording forms		Completed.
Output 6. Reporting by observer of marine based tourism compliance and human interaction with marine species..	1 x local observer appointed. Local observer training in data collection. Each local operator is observed 3 times per season during whale shark tours Each local operator is observed once each month during dive operation tours. Each local operator is observed twice a year during cetacean tours.	Output completed.
Activity 6.1 Marine observer trained.		Completed.
Activity 6.2, Assessment of each marine tourism operator (sports fishing, diving, whale shark tours and cetacean trips) conducted with report on compliance and including analysis of data collected		Completed.
Output 7. Establish comprehensive information system regarding whale shark and cetaceans in St. Helena's waters (including data on identification photos (eco ocean), biological data and tagging (whale sharks only)	60 days dedicated to collection of whale shark data during peak season. Successful deployment of 8 satellite tags on whale sharks. Collection of 8 genetic tissue samples Local promotion of photo identification pictures from tourists/locals of whale sharks and cetaceans Collation, analysis and management of photo records (including submission to ECO-OCEAN – see <a href="http://www.whaleshark.org">www.whaleshark.org</a> ) Educational video produced	Completed.
Activity 7.1 Deployment of 8 PAT tags on whale sharks.		Output completed.
Activity 7.2, Collection of biological & photographic data of all whale sharks seen (size, sex, T-zone) and submission to Eco-ocean		Completed.

Activity 7.3, Tag data retrieved and analysed by experts. Scientific publication produced		Completed.
Activity 7.4 Species action plan created for whale shark.		Completed.
Activity 7.4 Cetacean photo records collated and analysed		Completed.
Output 8. Deployment of mechanical & PSAT tags on marlin and tuna	12 PSAT tags deployed. <i>Originally: 16 tags deployed: 8 in winter 8 in summer (change request approved)</i>	Output completed.
Activity 8.1 Tag data retrieved and analysed. Scientific publication produced		Completed. Scientific publication not yet produced.
Activity 8.2, Species action plan created for marlin		Not completed – Marlin not captured therefore not possible.
Output 9. Application of marine ecosystem services assessment (incl. social and economic benefits)	Delivery of an ecosystem services assessment, including an estimate of the social and economic benefits derived from the ecosystem services..	Output completed.
Activity 9.1 Ecosystem services assessment focused on fisheries and tourism activities.		Completed.
Activity 9.2, Report describing the methods and results of the ecosystem services assessment, including an assessment of social and economic benefits associated with fisheries and tourism activities.		Completed.
Output 10. Development and application of future marine management scenarios	Management measures that protect ecosystem function whilst generating enhanced social and economic benefits are identified.	Output completed.
Activity 10.1 Local stakeholder workshops to develop realistic scenarios to test the application of a range of plausible future marine management measures.		Completed.

Activity 10.2, Recommendations for future marine management measures to protect the marine ecosystem whilst supporting the realisation of social and economic benefits.		Completed.
Output 11. Marine Ecosystem Service Assessment and Marine Planning capacity building programme	A minimum of 10 people trained in ecosystem service assessment to support marine planning and management.	Output completed.
Activity 11.1 Written guidelines to support the future application of social and economic assessment methods to inform marine management and planning		Completed.
Activity 11.2, Development of a tailored capacity building programme focused on marine ecosystem service assessment to inform marine management and planning.		Completed.

## Annex 3 Standard Measures

Code	Description	Totals (plus additional detail as required)
<b>Training Measures</b>		
1	Number of (i) students from the UKOTs; and (ii) other students to receive training (including PhD, masters and other training and receiving a qualification or certificate)	0
2	Number of (i) people in UKOTs; and (ii) other people receiving other forms of long-term (>1yr) training not leading to formal qualification	5
3a	Number of (i) people in UKOTs; and (ii) other people receiving other forms of short-term education/training (i.e. not categories 1-5 above)	3
3b	Number of training weeks (i) in UKOTs; (ii) outside UKOTs not leading to formal qualification	80
4	Number of types of training materials produced. Were these materials made available for use by UKOTs?	5
5	Number of UKOT citizens who have increased capacity to manage natural resources as a result of the project	2
<b>Research Measures</b>		
9	Number of species/habitat management plans/strategies (or action plans) produced for/by Governments, public authorities or other implementing agencies in the UKOTs	4
10	Number of formal documents produced to assist work in UKOTs related to species identification, classification and recording.	4
11a	Number of papers published or accepted for publication in peer reviewed journals written by (i) UKOT authors; and (ii) other authors	1
11b	Number of papers published or accepted for publication elsewhere written by (i) UKOT authors; and (ii) other authors	0
12b	Number of computer-based databases enhanced (containing species/genetic information). Were these databases made available for use by UKOTs?	2 (yes)
13a	Number of species reference collections established. Were these collections handed over to UKOTs?	0
13b	Number of species reference collections enhanced. Were these collections handed over to UKOTs?	0

Code	Description	Totals (plus additional detail as required)
<b>Dissemination Measures</b>		
14a	Number of conferences/seminars/workshops/stakeholder meetings organised to present/disseminate findings from UKOT's Darwin project work	10
14b	Number of conferences/seminars/workshops/stakeholder meetings attended at which findings from the Darwin Plus project work will be presented/ disseminated	3
<b>Physical Measures</b>		
20	Estimated value (£s) of physical assets handed over to UKOT(s)	
21	Number of permanent educational/training/research facilities or organisation established in UKOTs	1
22	Number of permanent field plots established in UKOTs	0
23	Value of resources raised from other sources (e.g., in addition to Darwin funding) for project work	0

## Annex 4 Publications

Type * (e.g. journals, manual, CDs)	Detail (title, author, year)	Nationality of lead author	Nationality of institution of lead author	Gender of lead author	Publishers (name, city)	Available from (e.g. weblink, contact address, annex etc)
Ongoing						



## Annex 5 Darwin Contacts

<b>Ref No</b>	DPLUS039
<b>Project Title</b>	Sustainable development and management of St. Helena's fisheries and marine tourism.
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# Annex 6 Supporting Documents