Darwin Plus:
Overseas Territories Environment and Climate Fund
Annual Report

Important note *To be completed with reference to the Reporting Guidance Notes for Project Leaders:*

it is expected that this report will be about 10 pages in length, excluding annexes

Submission Deadline: 30 April

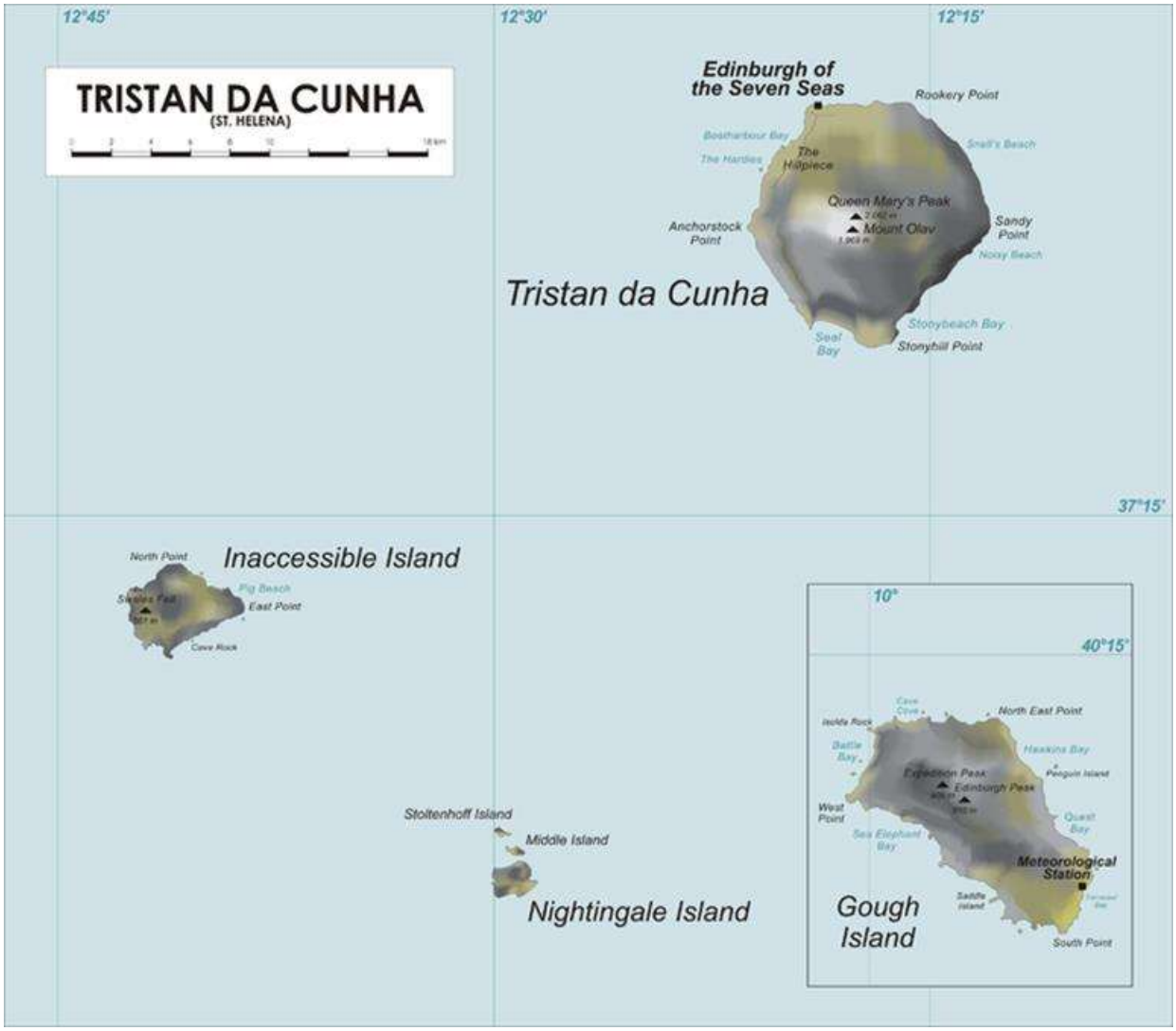
Darwin Plus Project Information

Project Ref Number	DPLUS005
Project Title	Sustainable management of the marine environment and resources of Tristan da Cunha (South Atlantic)
Territory(ies)	Tristan da Cunha (South Atlantic)
Contract Holder Institution	RSPB
Partner Institutions	Tristan da Cunha Government (Fisheries and Conservation departments)
Grant Value	
Start/end date of project	1st July 2013 – 31st July 2016
Reporting period (e.g., Apr 2015-Mar 2016) and number (e.g., AR 1,2)	1st April 2015 – 31st March 2016 (AR 3)
Project Leader	Andy Schofield. (RSPB)
Project website	
Report author and date	Andy Schofield, Robert Mrowicki, Sue Scott, Charles Kilgour and James Glass

1. Project Overview

The Tristan da Cunha rock lobster fishery provides 80-90% of the island's total gross income, enabling Tristan's self-sufficiency. The islands are important in a regional and global context for the conservation of marine wildlife, particularly seabirds, seals and cetaceans which are in turn proving important for developing tourism and therefore adding value to Tristans self sustainability. However, knowledge of the marine ecosystems on which the fishery depends is seriously deficient, making the current reliance on this fishery resource somewhat precarious. Recent stranding of an oil rig and a bulk carrier highlight risks from invasive alien/non-native species, oil pollution, and the need for an appropriate response capacity. The potential ecological impact of climate change is currently unknown and little has been done to date to monitor the situation. These challenges were identified through the RSPB's long working association on Tristan (more than a decade) and through new questions being raised in relation to the fishery through its recent Marine Stewardship Council certification.

This project will enable the Tristan Government to better manage its fisheries resource, and draw existing information on the marine environment together into a marine management plan. The project will enable the Tristan Government to develop the capacity to respond to future marine incidents and to monitor climate change impacts on key species. The project will enhance Islanders' expertise enabling them to continue the work themselves beyond this project.



Map 1. Tristan da Cunha is the world's most remote inhabited island, located almost half-way between South America and South Africa at a latitude of approximately 37.6 degrees South. Gough Island lies some 350 km to the south-east of Tristan at approximately 40 degrees South.

2. Project Progress

2.1 Progress in carrying out project activities

Output 1. Information base for sustainable marine and fishery resource management improved

Shallow subtidal surveys were conducted around Gough island again this year (Jan and Feb), in contrast to previous years when these surveys have been carried out by the visiting marine biologists with the support of the Tristan fisheries department this set of surveys were carried out soley by the diving team of the fisheries dept. This is testament to the excellent training and development that has been given in previous seasons and is proof that Darwin projects aid valuable training and development to small overseas territories. We still await the final results of these surveys but there is no doubt they will compliment the 11 sites around Gough Island that were surveyed in 2014-15 (see AR2), focusing on the south and west sides of the island, which were not accessible during the previous research visit in 2013-14 (see AR1) owing to adverse weather conditions. Although fewer surveys were completed this year compared with the previous year (as a result of the considerably shorter time available), this represents a significant achievement in terms of extending survey coverage around the entire island and filling gaps in species distribution data.

The status of non-native species introduced by the rig grounding at Tristan and the MV Oliva wreck at Nightingale was re-assessed by continued surveys at the respective sites, during which no new non-native species were identified. Additionally, many more specimens of the non-native South American silver porgy (*Diplodes argenteus argenteus*) were noted and obtained at Tristan for gut contents analysis; this species is becoming much more abundant has and is no longer only occasionally been observed during dedicated sampling excursions and is becoming much more abundant in certain areas around the islands making it much easier than in past seasons to obtain sufficient specimens for a more comprehensive analysis of diet overlap with native species.. Recognising the importance of other key species in the dynamics of marine communities around Tristan, monthly sampling has been initiated to begin characterising the reproductive cycles of sea urchins (*Arbacia dufresnii*).

Following previous attempts to observe adult lobster feeding behaviour *ex situ*, an outdoor experimental seawater tank has been set up to maintain lobsters under more 'natural' conditions. This facility has been used to complete a 40-day experiment to test for differences in lobster mortality rate among different tagging methods, the results of which will be used to improve stock assessment models informed by tagging data. Further, a six-week experiment was initiated to examine feeding interactions of lobsters with key prey species (giant kelp *Macrocystis pyrifera* and sea urchins *A. dufresnii*), of which surprisingly little is known. Although this experiment had to be abandoned due to failure of the seawater flow-through system, it will be continued during the next season by staff in the Fisheries Department. This work is being complemented by gut contents analysis using wild-caught specimens. The feeding experiment will also be used to assess the potential for lobster contamination by the anticoagulant agent brodifacoum (in collaboration with researchers at the University of Auckland and Landcare Research, New Zealand), for input into management plans relating to the proposed rodent eradication scheme for Gough.

Output 2. Capacity built for sustainable marine and fishery management

To build upon species identification skills acquired during the previous project phase, Whilst the marine biologist was in situ on the island during Jan-Feb further training was provided to fisheries staff in the form of lectures focusing on the most relevant species and containing additional biological information .More importantly, these skills have been put into practice and consolidated further via direct participation in survey work and data collection which includes self lead dive and data collection around Gough this season mentioned in the previous section.

During this phase of the projectthree Tristan fisheries staff have carried out advanced ocean surveys which have been completed under a range of conditions at all four islands and in particular around the remotest island of Gough. The diving experience of these three islanders was further enhanced by a formal drysuit training session and a diver rescue skills refresher course which is essential if they are going to carry on doing unsupervised subtidal monitoring and surveys beyond the end of the project.

An assessment of the vessel based observer programme operated by the fisheries department on the FV Edinburgh was carried out and a full review was undertaken of last years protocol resulting in an updated format for observer reports and the introduction and training of bycatch monitoring as part of the observers duties. Further training on data handling, analysis and storage were also given to key department employees.

Ensuring fishing vessel operators licensed in Tristan da Cunha waters fish in a responsible manner under strict controls is a vital part of sustainable managing of the marine environment. To help implement these controls project staff worked with the fisheries department to update license agreements and fishing regulations issued by the fisheries department to trawlers and longliners operating in the Tristan da Cunha Maritime Zone. The new regulations were drawn up in accordance with best practice, UK law and Regional Management Fisheries Organisations guidelines and these are now rolled out and standard practice with the Tristan fisheries department.

After the basic GIS training given in previous phases more advanced GIS training was given to department staff who are specialising in these techniques and now are using these techniques which are incorporated into the fisheries dept's present work programme and consolidation of this training is ongoing

Output 3. Capacity increased for marine incident response

Co-operation with the International Tanker Owners Pollution Federation (ITOPF) and the Island was initiated and talks are underway to formalise an agreement. The agreement will provide advice for the future draft marine contingency plan and to help develop training in oil pollution prevention and response.

Advice on available tools to assess oil pollution risks was provided to help facilitate the purchase of suitable shipping data and training was given on the use of a new system set up on the island to monitor shipping traffic (Exact Earth AIS).

Training was provided on monitoring techniques including setting up a monitoring site and sea search surveys can now be used in the event of an oil spill to monitor the marine impacts. These techniques will be used to develop a realistic response plan for an updated draft marine contingency plan before the project has finished. These plans are now well on the way to completion and will be achieved and hopefully in operation by the end of the project but if not then shortly afterwards.

Output 4. Capacity to assess effects of climate change in the marine environment enhanced

Long-term environmental monitoring sites that were established at Tristan during an earlier phase of the project, (1 intertidal and 1 subtidal), Nightingale (1 subtidal) and Inaccessible (1 subtidal), in addition to Gough (2 subtidal) were monitored again this year by the marine biologist and the Tristan fisheries dept. The selection of subtidal sites was based on accessibility (particularly important, given the frequent limitations imposed by adverse weather conditions at Tristan) and the presence of representative habitat types within safe diving limits (boulder/kelp areas, sponge-dominated vertical walls, and shallow algal turf habitats). Fisheries staff have received further training in survey techniques for obtaining quantitative ecological data from the primary habitat types (e.g. line transects and photoquadrats), including direct participation in the first round of surveys conducted at all designated sites. This includes the continued collection of long-term subsurface temperature data using iButton temperature loggers deployed at six sites as in previous phases (see AR2).

For monitoring lobster recruitment variability, an effective design for collectors used to sample settlement-stage lobster larvae (pueruli) has been developed, and arrays of three collectors have been deployed at the subtidal and intertidal monitoring sites at Tristan and the subtidal monitoring site at Nightingale. It is anticipated that the suite of monitoring sites will be expanded in future, although there are logistical limitations on the total number of sites that can be visited on a regular basis (e.g. weather conditions, fuel costs, availability of staff).

A BRUV (Baited Remote Underwater Video) rig was developed to pilot the survey technique for fish species, this included a metal frame that a Go-Pro could be attached to and an arm that held the bait in front of the camera. The survey was completed by watching the video of a 45 minute deployment and recording habitat, fish species observed and their relative abundances. Fish at Tristan are an important predator for juvenile lobster and there is currently no data on their abundance. BRUV surveys may also prove to be a way to get quantitative data on the population of invasive porgy at Tristan which is increasing at a very fast pace. It is hoped that the BRUV system will be a simple solution for the fisheries department to monitor changes in fish assemblages that is not reliant on diving. The kelp and rocky environment make the use of BRUVs challenging but not impossible, the aim is for the fisheries department to further develop the BRUV techniques introduced by the project to find a solution to monitor fish assemblages this way.

Output 5. Marine management plan developed for Tristan da Cunha

This process has now begun after the delays from last year and forms a substantial portion of the remaining workload towards completing outputs and is the main driver for requesting the project extension; the marine ecological baseline and monitoring data will feed directly into the development of a more comprehensive marine management plan that will include:

- Standard Operating Procedures for all monitoring techniques developed by the project
- Results and findings from the initial surveys and data analysis undertaken by the project
- Review of work done so far and recommendations for prioritising the most important surveys
- Marine Monitoring Programme for Tristan da Cunha including annual work plan for monitoring work

2.2 Project support to environmental and/or climate outcomes in the UKOT's

For the Tristan Government to plan for and mitigate against impacts of climate change on the marine environment long term monitor is vital. The process of standardised long term monitoring would have been difficult without the provision of a safe and effective survey craft and the development of the capacity for the fisheries department to carry out ecological surveys. Now these key elements are in place the project can propose a realistic and achievable long term monitoring plan.

Techniques in Sea Search surveys and fixed marine monitoring sites have been developed in line with other Atlantic UKOT's so that the findings can be compared between regions. It will also be easier to implement regional initiatives for all Atlantic UKOT's as the same techniques are being employed and a good working relationship has been developed between them.

Feedback from Tristanians is very positive. The most outstanding achievement is having the first Tristanians dive completely around Gough Island, although in the first year 2014, they were not really regarded as team members. This changed in 2015, when the international team members took them under their wing and trained them to undertake survey work (seasearch), which will continue after the project finishes. This has made a lot of difference and one thing that has been missing from previous projects.

2.3 Progress towards project outputs

Output 1. Information base for sustainable marine and fishery resource management improved

Progress towards completion of the Gough survey report has been delayed by Sue Scott's treatment for cancer; however the report is now at an advanced stage, and completion is expected shortly. The delay also means that information obtained by the second survey from the south and west coasts (which were not surveyed on the first survey due to weather conditions) can be incorporated into the main report, enabling a more complete description. Identification of key groups of invertebrates (sponges, hydroids, molluscs, bryozoans) and coralline algae is completed or ongoing (see appendices).

One of the research questions was to better define biological information of *J tristani* that is vital for improving the effectiveness of stock assessment work for the fishery. The research was able to establish that there is an adverse reaction by *J tristani* to tagging methods currently used to determine growth rates and population size. This enables fisheries managers to make important decisions about the direction of future research and the ongoing tagging programme.

Output 2. Capacity built for sustainable marine and fishery management

While six members of the fisheries department attended species identification lectures, three islanders have been involved in intertidal and subtidal surveys (with two main diving participants). While survey training was provided to conservation staff during the previous project phase, two fisheries staff members are now competent in performing Seasearch

surveys to an appropriate level. Standard Operating Procedures (SOPs) are being written for all project activities to provide a framework for continued survey and monitoring work, to be reviewed by fisheries staff.

The data collection programme was assessed as part of the project and found to be collecting an abundance of the vital data that is needed to manage the fishery. The staff also worked with the department to improve data management and identify the priority data that staff time should be focused on. The marine management plan will summarise the review and set out an agreed data collection programme in the future.

Output 3. Capacity increased for marine incident response

The project has introduced the key skills for monitoring the impact of an Oil Spill and helped to develop important links with international organisations. The expected draft contingency plan for marine incident was delayed and whilst a full plan my not be developed through this project the project is supporting the production of this through Tristan Government Policy Officer, a section on benthic and mobile marine species is planned for by the end of the project.

Output 4. Capacity to assess effects of climate change in the marine environment enhanced

The methodologies for monitoring of intertidal and subtidal habitats (including line transect and photo quadrat protocols, temperature logger servicing and puerulus collector sampling) have been established, in addition to the locations of suitable monitoring sites (see above). These protocols have been designed to be compatible with those utilised to survey marine habitats in other overseas territories within the South Atlantic (e.g. by SAERI and SMSG). Two islanders are now competent in conducting the full range of surveys and managing the resultant data, although extensive analysis is only achievable following the collection of a suitable long time series of data. As with all other project activities, a series of SOPs is being prepared for inclusion in a marine monitoring framework.

Output 5. Marine management plan developed for Tristan da Cunha

The plan drafting has been initiated by the project team and this will be completed before the project end in July, this will be a major step forward in marine stewardship for the island. However national workshops and external consultations are yet to begin and will be carried out in the next reporting period.

2.4 Progress towards the project outcome

The project outcome statement states that: The project will increase our understanding of the functioning of the marine ecosystems of the Tristan islands, and local capacity will be built to take better informed decisions on the sustainable management of the lobster resource and conservation of the wider marine environment, including tackling threats from the introduction of alien species, pollution from shipping incidents and climate change.

We believe that we will achieve this outcome, this can be illustrated though the two outcome indicators:

Outcome Indicator 1. Tristan da Cunha (TDC) government continues implementing surveys once project is completed in scientifically robust way.
TDC Government is committed to the long term implementation of further surveying / monitoring and research to the highest standards once the project ends. This has been shown through their full support with the capacity building efforts and in depth training given to key personnel within the Tristan Conservation and Fisheries Departments.

Outcome Indicator 2. Management plan utilised by TDC Government and resource users. Once all the data is gathered and analysed this will be vital information and an excellent foundation to underpin the fisheries management plan. This plan will be a key tool for TDC Government ensuring the long term and sustainable lobster fishery around Tristan on which the Island community is completely dependent upon.

2.5 Monitoring of risks

Description of the risk	Risk statement still relevant? Pls explain
No suitable researcher(s) recruited	Not relevant. An excellent team of researchers that are both knowledgeable and committed are currently working on this project.
Researcher(s) unable to cope with working on Tristan	Not relevant. Research team have worked excellently on Tristan this year and are well liked and respected for their commitment to the project by the local community and colleagues
Conditions unsuitable for surveys or landing fieldwork parties	Conditions at times this year were very challenging but the research team have adapted and lost very little work time to what could have been a much bigger risk.
Transport unavailable	No problems reported through transportation issues
Islanders unavailable for survey support and training	Islanders have shown full commitment to this project and have thoroughly immersed themselves within it and have take all opportunities to be involved and have been very receptive and excited by all the training opportunities that have been presented to them.

3. Project Stakeholders

The project staff works daily with the Fisheries Department in planning, implementing and reviewing all the work carried out. In addition the staff attended fishing committee meetings and work closely with the Island Administration and the fishing concession holder Ovenstone to ensure the work focuses on relevant issues and could be used directly in the management process of the fishery.

4. Monitoring and evaluation

Outputs	Indicators	Promised in proposal	Progress to date
1. Information base for sustainable marine and fishery resource management developed	Survey data for the 4 islands presented in reports by mid year 2 Species lists compiled for the 4 islands by mid year 2	Survey reports, published papers, data sheets, species lists, tracking maps and analysis reports, maps of key sensitive areas	Data sheets & survey forms completed, species list compiled and checked against WoRMS, Gough survey report and lobster tagging experiment paper in prep., preliminary data analysis in progress.
2. Capacity built for sustainable marine & fishery management	Five Islanders able to undertake marine survey work & complete survey forms, recognise potential alien species by mid year 2 One person from Tristan attends International Penguin Conference in 2013	Informal assessment by researchers and supervisors on Tristan. Training records in divers' logbooks. Trip report from conference.	Species identification training given to Fisheries department, Seasearch course provided for 3 Conservation staff, participation of 3 Fisheries staff in all survey/monitoring activities, dive log books up-to-date.

Outputs	Indicators	Promised in proposal	Progress to date
3. Capacity increased for marine incident response	Five personnel trained on survey/response following an incident by quarter 1 of year 2 Detailed contingency plan produced and consulted locally by mid year 2	Refined contingency plan including broader issues (e.g. oilspill) as well as alien species Diving records/logs	Survey/monitoring training provided (see above), collaboration with ITOPF initiated, access to ship tracking data obtained.
4. Capacity to assess effects of climate change in the marine environment enhanced	Methodology developed and tested by EOP Five islanders trained in the implementation of the methodology by EOP	Methodology document Training report.	Methodology for all monitoring activities developed and tested, participation of 3 Fisheries staff in data collection, monitoring manual (SOPs) in prep.
5. Marine management plan developed for Tristan da Cunha	National workshops well attended by all local stakeholders including scientific, conservation, fisheries and general public. External consultation process completed EOP Management plan document completed EOP	Workshop report Management plan Government website.	Synthesis of survey/monitoring data in progress, for incorporation into management plan.

5. Lessons learnt

The project design was broad and open to interpretation by the biologists which allowed them to direct the research to their experience. This uses the biologists strengths and allows room for adapting the project as you go along. It is important to build in time to allow overlap/handover between the teams of biologists to avoid loss of momentum and knowledge and to avoid confusion about the purpose of some of the work and build in continuity.

As the research adapted to the requirements of the stakeholders and the Tristan environment the budget requirements also changed and it would have been useful to have money available for unforeseen equipment like crevice collectors and lobster tanks which took a lot of the staffs time constructing.

Also how difficult it can be to work on the worlds remotest populated Island to strict timescales where weather, transport etc can set you back 2-3 months in the blink of an eye.

6. Actions taken in response to previous reviews (if applicable)

Comment 2: Dive training and long-term safety. It was previously recommended that one diver (currently certified as a Master Scuba Diver) be trained up to Divemaster level. The most effective means of achieving this would be an internship with a diving centre, with the appropriate materials (and extended period of time) to fulfil the course requirements while participating in ongoing diving activities. Although the minimum number of logged dives required for enrolment on the course is 40 (with 60 being the minimum number for certification), this is a very small number to be able to claim in-water competence, particularly at a professional level. Therefore, it is recommended that the candidate focuses on gaining additional diving experience (including survey work, which offers its own unique logistical and technical challenges). Obtaining funding for extended dive training (including to Divemaster level) could be a worthwhile goal for the future. In terms of general diving safety on Tristan,

limits and guidelines are adhered to consistently (see revised diving regulations, Annex 5), and participants are well aware of the remoteness of island and the difficulties involved in medical repatriation. Further expansion of diving activities may warrant the establishment of a dive officer role in the future.

(Comment 3: review assumptions (particularly at outcome and impact levels) to ensure activities undertaken will still contribute to achievement of project purpose.) See section 2.5 to our review of the risks and assumptions. We are confident that the activities remain valid and will contribute to the project purpose.

7. Other comments on progress not covered elsewhere

There has been very little progress between the last Annual report (AR2) and now, due to complications of vessel changes to Tristan which set us back nearly 6 months, so sadly, in some cases, there has been little further to add, although the Marine biologist is now back on Island and will be able to finish all the outputs for the project which with Darwin's kind permission and understanding of working in remote Overseas Territories granted us an extension until July 2016. I apologise if some of the information seems as though it is repeated from previous reports with only small updates. Although certain outputs that could be achieved at a desk based level both here in the UK and on Tristan have moved on significantly.

8. Sustainability

Having been in operation for over a year and a half, there is a strong awareness in the Tristan community of the project and the work being conducted as part of it. During the first year, islanders attended presentations about the project at the Tourism Department and School; during this phase, an additional talk was given at the School assembly.

Sustainability has been tremendously enhanced with the capacity building in skills and knowledge of the TCD and Fisheries Dept staff members. Such focussed and dedicated dive training for the TCD staff would otherwise be almost impossible for them to attain in such a remote position. Ensuring local divers are well equipped and trained and confident in their skills is the key factor in ensuring the sustainability of this work in the future. The legacy of this project will continue to give social, economic, ecological and technical benefits as this projects results will underpin future conservation and fisheries management plans.

9. Darwin Identity

A description of the project (including acknowledgement of funding from the Darwin Initiative) has recently been published in the February 2015 edition of the Tristan da Cunha newsletter (see article, Annex 6), which has a global audience. The Darwin Initiative logo has been used on species identification training presentations (see sample presentation slides, Annex 5) and The Darwin Initiative logo has been used at local events held on Tristan (for both of the current running projects on Tristan), and in the profile on www.tristandc.com The project has also featured in the Darwin Newsletter in Jan 2015 and in August 2014

The Darwin Initiative support is a separate project with a clear identity on Tristan. There is a good understanding of Darwin within the community on Tristan, although there are only one or two government departments with a clear understanding of the programme. The population of Tristan is very small (less than 300 people) and there have already been two successful projects leading to increased capacity on Tristan for conservation work. In fact, the pool of workers available for conservation work is still referred to as "the Darwin team" and one of the boats used for conservation work is known as the "Darwin Express". A Darwin logo will be attached to the boat funded by this project is planned once it is available.

Due to the extremely limited internet access on Tristan, it is difficult to download large files like the Darwin newsletter, so it would be good if hard copies could be delivered to key community members (e.g. Island Council, Heads of Fisheries and Conservation).

10. Project Expenditure

Table 1 Project expenditure <u>during the reporting period</u> (1 April 2015 – 31 March 2016)

Project spend (indicative) in this financial year	2015/16 D+ Grant	2015/16 Total actual D+ Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs			100%	
Consultancy costs			102%	
Overhead Costs			109%	
Travel and subsistence			46%	No workshop undertaken. No additional employee insurance costs incurred due to change in supplier
Operating Costs			91%	
Capital items			77%	Underwater camera costs cheaper than anticipated
Others (Please specify)			74%	Smaller proportion of costs spent by Tristan than anticipated, so their administration fee was reduced
TOTAL				

11. OPTIONAL: Outstanding achievements of your project during the reporting period (300-400 words maximum). This section may be used for publicity purposes

I agree for the Darwin Secretariat to publish the content of this section (please leave this line in to indicate your agreement to use any material you provide here)

Continuing the pioneering work conducted during the first phase of the project in 2014, marine biodiversity surveys were completed at an additional 11 inshore sites around Gough Island - all of which had never been explored by research teams before. Importantly, most of these surveys were carried out at sites that are normally rendered inaccessible by prevailing weather conditions, enabling full coverage of the island for the first time. Further, two subtidal monitoring sites were established at Gough to initiate the collection of valuable long-term ecological data from this remote, near-pristine environment.

The network of marine monitoring sites around the rest of the Tristan da Cunha archipelago (Tristan, Nightingale and Inaccessible islands) has also been expanded. Permanent transects within different subtidal habitats are now established at all islands, combined with arrays of collectors for sampling settlement-stage larvae of the Tristan rock lobster (*Jasus tristani*). This is an important step towards linking the health of the rock lobster fishery to the functioning of marine ecosystems, and providing key information to underpin the management of Tristan's marine resources. Having been involved in the planning and implementation of all survey activities, the Fisheries Department staff are now competent to continue the monitoring work and expand the network of sites as necessary.

Feedback from Tristanians is very positive. The most outstanding achievement is having the first Tristanians dive completely around Gough Island, although in the first year 2014, they were not really regarded as team members. This changed in 2015, when the international team members took them under their wing and trained them to undertake survey work (seasearch), which will continue after the project finishes. This has made a lot of difference and one thing that has been missing from previous projects.