Darwin Plus:

Overseas Territories Environment and Climate Fund

Annual Report

To be completed with reference to the "Writing a Darwin Report" guidance: (http://www.darwininitiative.org.uk/resources-for-projects/reporting-forms). It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

Submission Deadline: 30th April 2020

Darwin Plus Project Information

Project reference	DPLUS062
Project title	Securing the future of the Tristan marine environment
Territory(ies)	Tristan da Cunha (TdC)
Lead organisation	RSPB
Partner institutions	Tristan Government Fisheries Department
Grant value	£288,490
Start/end dates of project	1 April 2018 - 31 March 2021
Reporting period (e.g. Apr 2019-Mar 2020) and number (e.g. Annual Report 1, 2)	Apr 2019–Mar 2020 (AR2)
Project Leader name	Andy Schofield
Project website/blog/social media	www.tristandc.com
Report author(s) and date	Andy Schofield, James Glass, Rob Mrowicki, Ashleigh Atkinson, Jonathan Hall 6 May 2020

1. Project summary

Tristan da Cunha, a remote archipelago comprising four main islands in the south Atlantic (Error! Reference source not found.), is highly dependent on a healthy marine environment to support its MSC-certified rock lobster fishery, which provides 80-90% of the population's income, enabling it to be self-sustaining. The marine life of the islands is also of high conservation importance. However, the marine life and fishery are highly vulnerable to climate change, with the key kelp forest potentially disappearing if seawater temperatures increase. The high reliance on the lobster fishery makes it crucial for islanders that it is managed sustainably, and that the probable effects of threats from invasive introduced species and climate change are assessed in order to plan for the future. Previous Darwin projects (most recently, DPLUS005) have substantially enhanced local capacity for marine research and response to change through an increased knowledge base and training of islanders, and identified ways of improving data collection for fisheries management. This project aims to consolidate and build on this established base by further training for islanders in fisheries data acquisition and processing, including experience for the Head of Fisheries in a relevant country with sustainable lobster fisheries and established MPAs. The project also aims to fill gaps in knowledge of inshore biota, including the status of potentially invasive species, essential to underpin MPA decisions.

2. Project stakeholders/partners

The key stakeholders of this project are:

From the outset, the Tristan da Cunha Government (particularly the Fisheries Department) has been integrally involved in its implementation. The development of this project was based on a need to answer questions about the lobster fishery that the previous Darwin Project started, especially the high vulnerability of the Lobster Fishery to climate change. The Tristan government has been actively involved in decision-making and are fully supportive of this project and identified specific needs to be addressed.

Tristan Community, the people of Tristan da Cunha, whose livelihoods depend on the health of the marine environment, and who will therefore benefit from sustainable management initiatives towards which this project is contributing directly.

Fisheries Department, as the main project partner have been in frequent discussions regarding the planning, implementing and reviewing all the work carried out. In addition, the staff attended fishing committee meetings and worked closely with the Island Administration. There is regular contact between the UK and Tristan-based teams, and staff appointed to the project by the RSPB has been recruited with input from Tristan.

RSPB, is committed to facilitating support within the Tristan da Cunha island group to both the terrestrial and marine ecosystems. RSPB has been involved within Tristan for over 15 years and will continue to support conservation work on the islands and work in partnership with all government departments to secure a lasting legacy for the future of Tristan.

Ovenstones Pty, the fisheries concession holder, are extremely supportive of the project and provided facilities onboard their lobster fishing vessel Geo Searcher to carry out the Lobster Tagging trails again this season.

CEFAS and MMO, although not project partners, both organisations are contributing to some related issues and objectives under the Blue Belt programme. Both MMO and CEFAS gave training to Tristan Fisheries staff in the UK during 2019, and CEFAS will be helping with the analysing of plankton samples during the 2020/21 FY. Both stakeholders bring invaluable technical expertise and are crucial in the long-term management of the MPA.

A number of scientists who have worked on previous Darwin projects and have an interest in the Tristan marine environment have also provided specialist advice and support.

3. Project progress

3.1 Progress in carrying out project Activities

This year there was a late start to the project activity as three of the five Fishery Department staff were in the UK, undertaking training with MMO and CEFAS under the UK Government's Blue Belt Programme, only returning to Tristan between June and August. In July 2019 a major storm then hit Tristan, severely damaging many Government buildings. It is considered the worst natural disaster to have hit Tristan since the volcano eruption of 1961 (https://tristandc.com/storm-2019-07.php). Another storm in November compounded the damage, and Fishery Dept staff had to help the Public Works Department carry out urgent building repairs, delaying progress further. During November 2019 – February 2020, consultant marine biologist Rob Mrowicki visited Tristan to assist Fisheries Department staff in achieving project objectives, as outlined below. The primary aim of this visit was to train staff and establish methods for the respective monitoring activities, while collecting the second round of survey data, to provide a basis for continued work over the subsequent months. Good headway was however made in the early part of 2020, but unfortunately due to changing shipping schedules the consultant marine biologist (Rob) had to leave roughly a month early and just as well as he would have been stranded on Tristan due to the COVID-19 virus and the banning of vessel entries to Tristan.

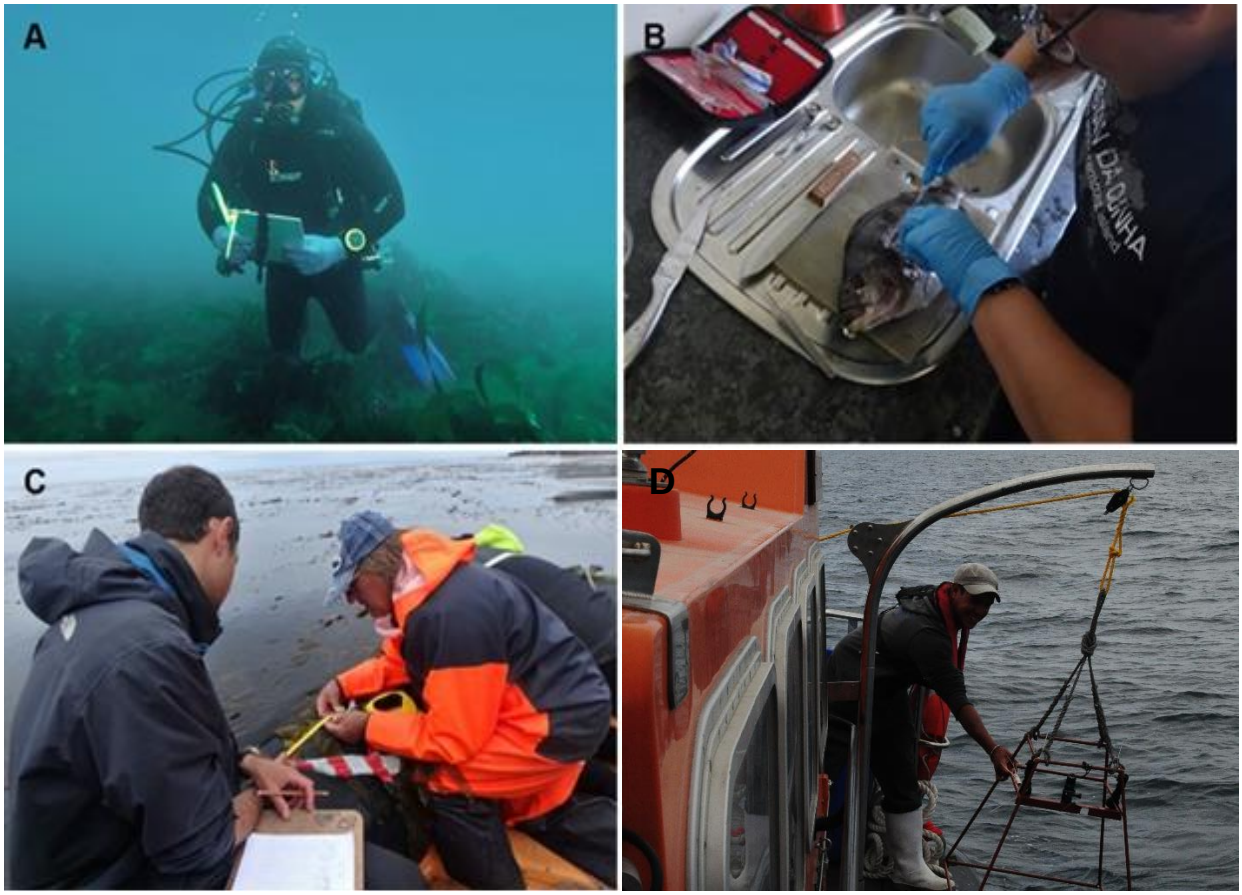

Figure 1. Tristan da Cunha Fisheries Department staff conducting scientific activities: (A) subtidal monitoring surveys, (B) fish sample dissection, (C) kelp growth measurement and (D) deep-water camera deployment.

Output 1. Tristan da Cunha has greater local capacity to manage its marine resources sustainably

1.2 Fisheries observer training in Cape Town for 3 islanders, on fishing methods for species other than rock lobsters

One Fishery observer received Personal Safety Training (PST) training in South Africa in July-August 2019 (**Annex 3.1**). Further training in sea-fishery observer duties other than lobster was

planned for March 2020, however due to COVID-19 imposed travel restrictions this training was postponed.

1.3 Continued training for islanders in fisheries data gathering, processing and use for fisheries modelling

During February – July 2019 two staff from the Tristan Fisheries Department staff received training at CEFAS in the UK on data management, database development, data storage, and presentation skills (**Annex 3.2**). Rob Mrowicki also built capacity in a 'learning by doing' approach during his three months on island working alongside Fisheries Department staff to clean existing data and appropriately record new inputs.

1.4 Further training and dive experience for 3 islanders on Tristan.

One islander, a Fisheries staff member and qualified Rescue Diver, gained further diving experience (an additional five dives, **Annex 3.3**) through participating in underwater surveys with Rob during his visit, following a brief dive theory refresher and review of Tristan diving regulations established during previous projects. Rob (a diving instructor) conducted a combined introductory/refresher dive (based on guidelines for the PADI ReActivate programme for certified divers) with one Conservation Department staff member who had previously received some informal dive training on Tristan. This staff member was off-island for much of the period of Rob's visit, but has now reached a skill level to dive alongside a more experienced diver in a buddy system.

It was the aim to train three islanders on Tristan, however the third islander for which this training was intended is no longer resident on-island. Unfortunately, and there are no other suitable candidates with both the interest and capacity in this small community to undertake this training and reach the skill level required during the remaining scope of the project.

1.5 Continued and expanded training and involvement in marine survey methods for 5 islanders, including recording, identification, data processing etc.

Marine biologist Rob Mrowicki visited Tristan during November 2019 to February 2020, to assist the five Fisheries Department staff with ongoing fieldwork and provide additional training in scientific data collection, including deep-water drop-down camera deployment, fish dissection and biological sampling, and giant kelp growth measurement (**Error! Reference source not found.**). This was achieved through on-the-job-training and more formal lecture-style presentations focusing on identification of common species and seaweed (**Annex 3.4**).

1.6 An integrated database is established for storing/querying fisheries and marine environmental data, and all related metadata.

Database structure has been investigated for the Tristan Fisheries department (**Annex 3.5**). Due to staff changes there has been a delay in setting up this database; this will likely be re-framed for the 2020-21 year. Necessary preparatory work has been advanced however, with the consultant and Fisheries Department data manager cleaning and collating existing data.

2. The monitoring of the lobster fishery is improved through research and the introduction of new technology

2.1 Procure and install fishing activity monitoring technology on local Tristan fishing boats to improve accuracy of fishing effort data, essential for sustainable fisheries management.

Fishing activity monitoring technology, consisting of a GPS tracker powered by a solar charger, was trialled by Fisheries observers on the commercial lobster fishing vessel Geo Searcher during a fishing trip around Tristan in December. This had limited success unfortunately, owing to failure of the solar charger after the first day. Trackers were also installed on a local fishery boat but experienced software issues. Three staff in the Fisheries department have also been trained in deploying these GPS trackers via 'dummy' fishing excursions during fieldwork on the Fisheries RIB. There are currently no loggers on any vessels as it is not fishing season. Loggers will be installed in 2020-21.

There was also an issue with equipment with the waterproof cases not being suitable for the batteries. Multiple loggers are now being used to gather to required data. This will be resolved in the 2020-21 project year.

2.2 The impact of tagging Tristan lobsters is reduced by undertaking an extended study of tagged lobster in captivity

Experimental trials to determine the effects of two different tagging methods on lobster mortality were conducted on the fishing company's Geo Searcher vessel during between August 2019 and January 2020, with 100% independent Tristanian observer coverage on board. Further tagging was planned at the end of the season in March 2020, however due to the risk of COVID-19 a decision was made to not put any observers on the vessel.

Two types of tags were trailed (T-bar and fish tags) and no difference in mortality was found, after 4 months, between the two tags. The tagging methods have been adjusted based on recommendations from the University of Cape Town to measure natural morality. This coming season it is the intention to trial the two tags alongside a control tank (**Summary of study to be provided by Fisheries Department**), if the COVID-19 lobster sale drop-off doesn't cause a major reduction in fishing effort due to a backlog of frozen stock (lobsters being primarily sold to / consumed in restaurants).

3. Critical information on *Jasus Tristani* life history and ecology is used to improve long-term monitoring and management of stocks

3.1 Sample lobster pueruli larvae using pueruli traps, in-water surveys and plankton hauls to improve understanding of seasonal/annual abundance and to inform modelling

An additional 20 surface zooplankton samples were collected from inshore waters around Tristan, Nightingale and Inaccessible islands, between September 2019 and March 2020. This was originally proposed as a simple means to monitor annual variation in the abundance of lobster phyllosoma and puerulus larvae, in addition to its main purpose of collecting baseline data on the dynamics of zooplankton communities as indicators of changing conditions (Activity **5.4**). However, only a single phyllosoma larva has been found following preliminary examination of all plankton samples (see previous annual report), therefore this sampling method is probably inadequate for detecting variability in lobster larval abundance. This outcome is not surprising, given the very low densities of phyllosoma larvae in surface waters, particularly during daytime, which is when RIB-based excursions necessarily take place. More comprehensive data on larval abundance have been obtained from vertical plankton tows undertaken during recent research cruises (British Antarctic Survey offshore vessels James Clark Ross and Discovery), which will support this objective (**Annex 3.6**). Subsurface tows using larger nets and carrying out tows during the night may produce more successful results.

Pueruli traps were placed in three locations with the intention of sampling lobster larvae but were destroyed due to the storms therefore no samples were collected. In-water surveys were considered to be an ineffective method for sampling the species given its rarity.

3.2 Assess Pueruli habitat preferences through underwater searches; traps with different materials.

Similarly, assessing pueruli habitat preferences *in situ* via underwater searches is impractical, given the rarity and/or cryptic nature of this larval stage, which is why the use of puerulus traps containing materials mimicking different habitat types (e.g. algal turf, rock crevices) has been suggested as an alternative method. Various designs of subtidal puerulus traps have been trialled during previous projects (e.g. DPLUS005), with low success owing to damage from storms and difficulties in accessing remote sites regularly. Three pueruli collectors were deployed in 2019 and trialled at three different locations but, unfortunately, all were destroyed.

Knowledge gained from the Director of Fisheries' research trip to California (Activity **1.1**) will be used to deploy one or two mesh-based puerulus traps in large rock pools at Runaway Beach, accessible from the shore, as the remaining option to complete this objective. Due to COVID-19 there has been a difficulty in obtaining the materials for the mesh-based puerulus traps as there have been no vessels from Cape Town since February.

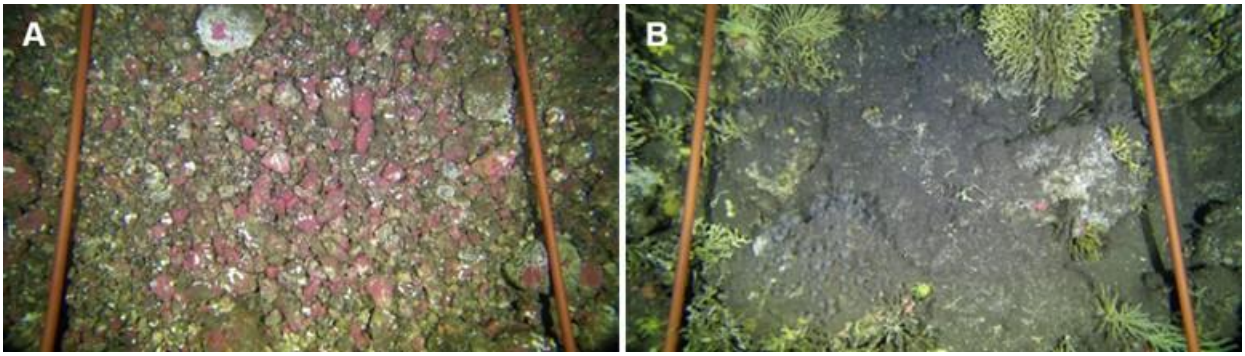

Figure 1. Representative images of deep-water benthic habitats around Tristan island, at (A) 69.6 m off the north-northwest coast and (B) 83.4 m off the east coast.

3.3 Continue assessment of juvenile lobster/fish food supply through surveying smaller biota of different habitats, depths, types of seaweed cover through analysis of turf samples.

As part of DPLUS005, research was conducted into the abundance and diversity of invertebrate fauna inhabiting algal turfs, as a putative food source for juvenile lobsters in shallow intertidal habitats. Additional specimens collected during 2018-19 season, representing the most common species, were sent to the invertebrate curator at the Natural History Museum for identification, which is ongoing.

3.4 Assess dietary requirements of adult lobsters through further gut content analysis and recording of night-time foraging behaviour.

Research into the dietary requirements of adult lobsters was undertaken by the University of Cape Town in 2016 (**Annex 3.7**) and some analysis completed during the project (**Annex 3.8**). As the work has already been undertaken (unbeknownst to Tristan at the time of project development) this activity is no longer considered to be a good use of project funds.

3.5 Acquire basic data on under-recorded habitats, particularly life on the deeper seabed at 30-100m (depths affected by the lobster fishery), and on cobble/pebbles (probably an important refuge habitat for larval lobsters and adults feeding)

A deep-water video camera, rated to 250 m, was purchased by the project, and used to obtain footage of seabed habitats at 30–100 m for the first time (see also Activity **6.3**). Following trial camera deployments from the Fisheries rigid inflatible boat (RIB), eight further deployments were conducted from the newly refurbished patrol vessel, Wave Dancer, off the coast of Tristan island, at depths of between 38 and 121 m. These initial images show a range of different habitat types, including coralline algae-encrusted cobbles/pebbles and bedrock pinnacles covered with branched corals and sea fans (**Figure 3**; **Annex 3.8**), hinting at the existence of areas dominated by fragile, habitat-forming organisms, which may be critical to the structure and functioning of nearshore benthic ecosystems, as well as contributing to carbon sequestration. While camera deployment and retrieval methods still need some refinement, additional footage will be obtained from the deeper seabed around Tristan and, if possible, Nightingale and Inaccessible islands, during the final year of the project. This habitat data will be cross-referenced against lobster catch data to determine the most important habitats for lobster.

4. The status of invasive marine species and their potential impacts on native ecosystems are determined, and monitoring protocols established

4.1 Surveys of distribution and abundance of South American silver porgy at Tristan, and for presence at Nightingale and Inaccessible.

For the purpose of monitoring the distribution and relative abundances of fish species, including the porgy, a total of 24 Baited Remote Underwater Video (BRUV) surveys were carried out at seven locations across Tristan, Nightingale and Inaccessible islands between September 2019 and February 2020. Last year it was found that porgy are prevalent at Nightingale Island, this method also confirmed their presence at Inaccessible Island on 31 January 2020. Thus, the introduced South American silver porgy is now widespread throughout the shallow coastal waters surrounding Tristan's top islands (**Annex 3.9**).

4.2 Study reproductive state and diet of the invasive porgy fish through trapping (gill and/or seine netting) and dissection of large sample.

Only 11 South American silver porgy (*Diplodus argenteus*) were sampled during 2019/20, 10 of which were caught at Tristan in January or February 2020, to provide additional data on the reproductive state and diet of this non-native species introduced recently to Tristan waters. These specimens were processed alongside 11 fivefinger (*Acantholatrismonodactylus*), also obtained in January.

The Fisheries staff member who was trained in fish dissection and gonad, otolith and gut contents extraction last year conducted the laboratory work, thereby consolidating their training (**Error! Reference source not found.**). Preliminary findings suggest that there is currently little niche overlap (i.e. competition) between fivefinger and porgy, at least in terms of diet, which has probably contributed to the widespread establishment of porgy at Tristan (**Annex 3.8**). Fivefinger are a staple food item for the Tristanian community.

Despite recommendations that samples should be supplemented with incidental catches from the recreational fishery to ensure good temporal coverage throughout the year, especially while the Director of Fisheries and two staff members were off-island for training, no samples were collected throughout the whole of 2019. The Fisheries Department has now issued a public request for intact porgy, whereby the people contributing the most specimens by the end of the year will be rewarded with prizes, and some interest has been shown and two additional samples provided.

There has been some success in catching porgy using the spear-fishing method but less samples have been caught than anticipated due to difficulties in catching the fish: they are not taking the bait and with the abundance of fivefinger opportunity is limited. Tangle net or gill nets may be more successful in catching porgy but, under licencing conditions, gill nets are banned in EEZ and there are significant by-catch issues.

Alternative fishing techniques continue to be developed and a public reward will be offered again for porgy samples next year.

4.3 Surveys of porgy abundance/distribution at selected sites; assess population structure (sizes, sex ratios), reproductive cycles (gonad visual inspection and preservation for later histological analysis) and dietary overlap with native species e.g. fivefinger (gut contents analysis); establish regular sampling protocols

Through Activities **4.1** and **4.2** progress has been made in this activity.

Porgy appears not to contribute substantially to the abundance and biomass of fish assemblages (**Annex 3.#**). Gonad dissection has continued with the aim of understanding the reproductive cycles of the porgy but more data is required to determine peak reproductive period in the year. Three Fisheries staff members were trained by Rob in the processing and analysis of BRUV footage to obtain standard metrics of fish abundance and diversity. Analysis of this year's videos is ongoing.

Sampling protocols have been developed and continue to be fine-tuned (**Annex 3.10**)

4.4 Surveys to look for new settlement of invasive mussels Mytilus galloprovincialis from the wreck of the Oliva in 2011, both shore and subtidal, at Nightingale

For the second consecutive summer fieldwork season poor sea conditions unfortunately prevented any attempt to survey the highly exposed MV Oliva wreck for non-native species, including the mussel *Mytilus galloprovincialis*.

4.5 Surveys to continue checking for establishment of invertebrates from the rig stranding in 2006, especially at sites near Trypot; implement checks on hulls of yachts visiting Tristan; install PVC settlement tiles at a number of accessible sites (monitor using underwater photography).

Unfortunately, during a dive on 15 February 2020, it was discovered that the settlement panels deployed in November 2018 to monitor invertebrate settlement were lost from their mooring, which had been destroyed at some point during the intervening 15 months, likely as a result of one of the severe storms that Tristan experienced during 2019. Further settlement tiles will be

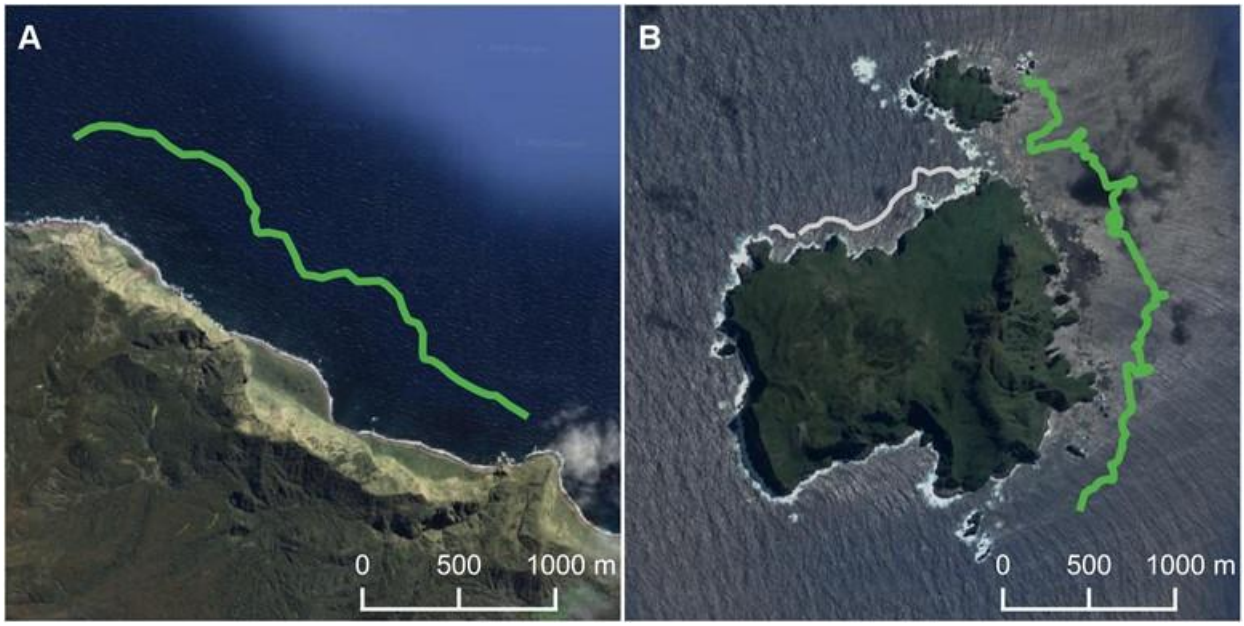

Figure 2. Outer boundaries of sections of giant kelp (*Macrocystispyrifera*) forest habitat at (A) Inaccessible and (B) Nightingale islands mapped during 2018/19 (grey lines) and 2019/20 (green lines). Satellite images © Google.

deployed at different sites to trail suitability. The implementation of biosecurity practices, such as hull checks, will be investigated for 2020-21.

5. Habitat and species distributions are mapped and monitored to assess potential effects of climate change

5.1 Map habitats using existing and new survey data

Mapping of habitats has taken place at Nightingale, Inaccessible and Tristan (with data collected for 222, 51 and 8 locations within the respective islands). Further detail and maps can be found in **Annex 3.8**.

5.2 Establish methods for mapping giant kelp cover and assessing biomass; tracking changes in response to local- and large-scale environmental stressors. Establish methods and sites for assessing kelp growth and condition (possible early indicators of stress), and seasonal changes.

The outer boundaries of two more sections of giant kelp (*Macrocystispyrifera*) habitat were mapped at Nightingale and Inaccessible islands in January and February 2020 using a simple boat-based method established during the previous year (**Figure 4**). Continued kelp mapping via this method, combined with other fieldwork, will provide a baseline for detecting significant shifts in kelp forest extent and for ground-truthing other, more sophisticated approaches involving remote sensing. Unfortunately, the Fisheries team did not manage to revisit the site at Nightingale Island where, during the consultant's visit the previous year, initial kelp frond measurements were taken in order to assess kelp growth rates; however, a series of new measurements were taken at the same site in February during the current year, with the aim of revisiting to obtain second measurements after approximately one month. Upon re-visiting the site, the markers were not detectable due to dense kelp fronds. An alternative method has been trialled whereby small floats are attached to the site and trailing collecting data at intertidal pools which are easier to access.

5.3 Expand long-term climate change impact monitoring sites using methods developed in other South Atlantic UKOTs

During Rob's visit, subtidal monitoring surveys were conducted at six sites across Tristan, Nightingale and Inaccessible islands, including two sites previously designated as long-term monitoring sites, namely Puma Rock at Tristan and the Waterfall at Inaccessible (see DPLUS005 final report), and four new sites, contributing to the baseline data collected during previous surveys and expanding the network of potential long-term monitoring sites. Additionally, repeat intertidal monitoring surveys (implemented during DPLUS005 and repeated last year) were conducted at Runaway Beach on Tristan on 8 January 2020 to enable

interannual comparisons. Analysis of these data, including species identification and abundance estimation in quadrat photographs, is ongoing.

5.4 Study seasonal/annual changes in plankton ecology/populations through regular hauls, record abundance and composition, preserve. Look at possible differences between Tristan & Nightingale, especially in summer when Subtropical Front possibly present.

The 29 plankton samples (see Output 3, above) were collected in the vicinity of the same six sites. Sampling was undertaken at different points across years so there is a difficulty in determinising whether the results show seasonal or annual variability. These samples have undergone preliminary analysis on Tristan to determine the densities of major zooplankton groups and by Cefas (**Annex 3.8, 3.11** and **3.12**), these along with all the plankton tows done during this FY will be analysed in more detail by Cefas at the end of the project. The existing data represent a partial baseline for future comparisons, to be complemented with additional data from offshore plankton samples collected using different techniques, such as those employed during recent Blue Belt research cruises.

5.5 Continued collection of long-term sea surface temperature data and collection of data from subtidal data loggers.

Ongoing collection of long-term sea surface temperature data via subtidal temperature loggers has been unsuccessful for a number of reasons. First, the device used to download data from the logger at Nightingale island at the end of 2018 (see previous annual report) failed. Second, during attempts to recover data from the two remaining loggers deployed at Tristan and Nightingale islands this year, it was discovered that both loggers have disappeared from their moorings, with the mooring at Nightingale having been destroyed, likely by the 2019 storms. There are two temperature loggers at Gough Island, however due to the change of the fishing vessel from Edinburgh to Geo Searcher (which cannot carry the Fisheries RIB) Fisheries staff have been unable to get there. Arrangements are currently being made for the Edinburgh to be granted a licence to fish at Gough so staff can get there this FY, however this may be inhibited by COVID-19 and possible cancellation of Gough fishing entirely for the coming year.

6. Tristan da Cunha has greater local capacity to prepare for large scale Marine Protected Area Management

6.1 Fact-finding visit for Director of Fisheries to another country with appropriate MPAs and fisheries, to establish how they may be managed together. The trip will also include time in the UK meeting with relevant organisations and individuals.

This activity was completed in Year 1 of the project via a trip to California (see previous Annual Report).

6.2 Map and collate existing data to identify biodiversity hotspots.

The RSPB has lead a highly collaborative process to identify marine hotspots for nine seabird species and one pinniped species that breed in Tristan, utilising data collected by the Tristan Government and off-island collaborators over the past 20 years from 397 individuals animals. An 18-author peer-reviewed journal paper, detailing the biodiversty hotspots across all four seasons, was published in January 2020 in *Animal Conservation* (**Annex 3.13**).

6.3 Acquire data on the biota of deeper water. A comprehensive survey of the seabed in waters below 30m is beyond the scope of this project, but preliminary information will be recorded using GoPro cameras in underwater housings depth-rated to 1,500m.

See Activity **3.5**.

6.4 Hold workshops/meetings on/off Tristan as appropriate to discuss MPA establishment at Tristan, aims and mechanisms.

The Director of Fisheries attended meetings with Cefas, RSPB, FCO and MMO during May 2019, whilst the Director of Conservation, Administrator and Tristan Environmental Policy Officer attended a MPA planning workshop at British Antarctic Survey in June 2019. A number of marine protection strategy documents were produced outlining possible improvements,

informed by the hotspots identified under Activity 6.2, and meetings were held on Tristan in September 2019 to discuss MPA options (**Annex 3.14**).

CEFAS researcher Oli Yates visited Tristan during August–October 2019. The objectives of the engagement visit were to disseminate the information and advice developed through the Blue Belt Programme to the Tristan da Cunha Island Council and local community and to support the Island Council with any information required to take decisions on the marine protection strategy. A public talk was arranged on the 19 September at the Prince Philip Hall. An overview was provided of the evidence and information generated through the Blue Belt Programme and external stakeholders. Advice associated with each of Tristan da Cunha's key marine habitats (inshore, seamount and offshore) was explained in relation to marine protection strategy options.

Seven items were agreed during an Island Council meeting including no further bottom trawling permitted on the seamounts and an increase in no-take zones (**Annex 3.15** and **3.16**). These will be publicly announced in 2020.

3.2 Progress towards project Outputs

Output 1. Tristan da Cunha has greater local capacity to manage its marine resources sustainably

See section 3.1, Output 1. Output 1 is largely on track to be delivered by the end of the project. Indicators 1.1 and 1.5 are complete (**Annex 3.17** and **3.4**, respectively) and progress has been made against indicators 1.2-1.4 and 1.6; One fishery observer has received training (Indicator **1.2**; **Annex 3.1**), two Fisheries staff have received training in data collection and processing delivered by MMO (Indicator **1.3**; **Annex 3.2**), two islanders have received diving training (Indicator **1.4**; **Annex 3.3**) and the development of an integrated database is underway utilising the skills gained under Indicator **1.3**. These indicators directly contribute to the Output by increasing the skills and tools available to manage marine resources.

The number of islanders to receive diving training is to be reduced to two rather than three, as the third person identified to receive training is no longer on island and an alternative is unlikely to be found (Indicator **1.4**). As highlighted in the previous annual report, a handful of other islanders are qualified to at least a basic level, but are mostly unavailable (e.g. working for other departments) and/or would require a great deal more instruction to become sufficiently competent scientific divers, especially given the considerable risks posed by diving at such a remote location subject to highly changeable environmental conditions and without a decompression chamber. As such, there is still very little capacity for conducting safe diving operations at Tristan, which is unlikely to be remedied during this project. Opportunities for diving training in Cape Town will be investigated for the coming project year.

Development has begun on the database with reframed objectives: the database is intended for use for Fisheries staff and will contain all metadata (Indicator **1.6**). The capacity for the database to be integrated and queried is beyond the skills of existing staff and remaining time in this project.

Output 2. The monitoring of the lobster fishery is improved through research and the introduction of new technology

See Section 3.1, Output 2. Output 2 is likely to be somewhat achieved by the end of the project. Progress towards Indicator **2.1** has been limited due to technology failures. The installation of further monitoring technology is planned for 2020-21 and whilst some preliminary data will be collected, an accurate estimation of fishing effort will likely be realised beyond the life of the project.

Good progress has been made against Indicator **2.2** with 40 lobsters being tagged. The results from the 2019-20 season showing no difference in mortality between two types of tags (**Evidence to be provided by Fisheries Department**). In March 2020 no lobsters were tagged due to COVID-19 restrictions. The intention is to continue tagging in 2020-21 with the addition

of a control group of lobsters. However, progress against this indicator may be impacted by COVID-19.

Output 3. Critical information on *Jasus tristani* life history and ecology is used to improve long-term monitoring and management of stocks

See Section 3.1, Output 3. Output 3 is unlikely to be wholly achieved by the end of the project. Whilst activities have been undertaken to collect data for Indicator **3.1**, the methodology has proved to be insufficient therefore the abundance of lobster larvae is unlikely to be determined (**Annex 3.8**). It may be more suitable to reframe this indicator to focus on establishing the best methodology.

Similarly, the deployment of mesh-based puerulus traps in rockpools at Runaway beach was inhibited by a lack of appropriate materials (Indicator **3.2**). Whether this will be achieved by project close depends on the extent to which vessel operations are impacted by COVID-19 to obtain materials. Previous projects (e.g. DPLUS005) have had limited success due to accessibility and weather.

Some progress has been made against Indicator **3.3** with kelp mapping and acquiring data on under-recorded habitats (**Annex 3.8**). But limited progress has been made on surveying smaller biota due to damage to monitoring equipment. Further kelp mapping is planned in 2020-21, particularly through the use of drones to but this is dependent upon COVID-19 travel restrictions (the Director of Fisheries had planned to visit the UK in March 2020, where he was to receive drone training from British Antarctic Survey, but this was cancelled by the global lockdown). Some progress has been made towards Indicator **3.4** but as this has been achieved outside of the project activity will not continue (**Annex 3.7** and **3.8**).

Good progress has been made against Indicator **3.5** with 11 camera deployments investigating habitats where there is currently no existing data (**Annex 3.8**). Understanding what habitats are important for lobster larvae and adult feeding will improve the management of the marine environment for lobster.

Output 4. The status of invasive marine species and their potential impacts on native ecosystems are determined, and monitoring protocols established

See Section 3.1, Output 4. Some indicators within this Output are likely to be achieved, but the Output is unlikely to be achieved in its entirety.

Good progress has been made towards Indicator **4.1** and **4.3** with 21 Baited Remote Underwater Video (BRUV) surveys taking place in 2019-20 in addition to 29 in 2018-19. Evidence against **4.1** includes the science report (**Annex 3.8**) and the BRUV report (**Annex 3.9**). During the project, the presence of the invasive porgy has been confirmed at Nightingale and Inaccessible. However, with the limited amount of data available from a relatively small number of BRUV deployments, few conclusions can be drawn regarding spatial and temporal variation in fish assemblages at Tristan; yet the video footage acquired so far provides an important baseline against which future comparisons can be made.

To date, 15 porgy samples have been obtained for analysis (Indicator **4.2**) with some preliminary analysis available in **Annex 3.8**. It is unlikely that the target of 100 porgy's will be reached and revised aims will be proposed.

Indicators **4.4** and **4.5** are unlikely to be achieved as progress thus far has been prevented by poor sea conditions or damage to equipment.

Output 5. Habitat and species distributions are mapped and monitored to assess potential effects of climate change

See Section 3.1, Output 5. Output 5 is likely to be somewhat achieved by the end of the project. Mapping methods have been established (Indicator **5.1**) with the addition of drones used for ground-truthing in 2020-21, however this is dependent upon COVID-19 travel restrictions. A successful method for monitoring kelp biomass was trialled in Nightingale (Indicator **5.2**) and

baseline data collected, the methodology will be applied to further sites in 2020-21 (**Annex 3.18** and **3.10**).

Subtidal monitoring sites have increased to six (Indicator **5.3**), encompassing multiple islands and habitat types: Tristan (Puma Rock, Jew's Point, Trypot, Cave Point, Hillpiece), Nightingale (Blinder, Oliva), Inaccessible (Waterfall, South Hill) (**Annex 3.10**). Repeat monitoring will continue in 2020-21.

Plankton samples have been collected during two different seasons (Indicator **5.4**) (see also Section 3.2, Output 3, Activity 3.1) and sent to CEFAS for analysis (**Annex 3.12**), and further samples will be collected in 2020-21. Arguable, extensive long-term sampling is necessary for detecting spatial and temporal trends in density and community structure but the data collected during this project will provide a baseline to compare against.

Limited progress has been made towards Indicator **5.5**; whilst data loggers have been deployed no data has been retrieved due to software failures or equipment missing from moorings, likely due to the storms in 2019. Therefore, long-term sea surface temperature is unlikely to be determined during the project to assess changes. Further loggers will be deployed as soon as possible.

Output 6. Tristan da Cunha has greater local capacity to prepare for large scale Marine Protected Area Management

See Section 3.1, Output 6. Output 6 is on track to be delivered by the end of the project. Indicators **6.1** and **6.2** are complete with the trip to an MPA undertaken in Year 1 and the biodiversity hotspot report published in 2020 (**Annexes 3.17** and **3.13**, respectively).

Data-deficient habitats have been recorded (Indicator **6.3**) under Output 3 but it is acknowledged that additional surveys, targeting representative depths along a greater number of radial transects encircling Tristan, Inaccessible and Nightingale islands, are required to shed further light on the nature of these unexplored habitats (**Annex 3.8**). See Section 3.1 Output 3 also. Deployments of the camera can continue without a marine biologist in 2020-21 as Fisheries staff have gained the necessarily skills to operate the camera and analyse footage.

Significant positive progress has been made against Indicator 6.4 with workshops and meetings taking place with CEFAS, MMO, FOC and RSPB during 2019-20 (**Annex 3.14**) resulting in a new marine protection strategy (**Annex 3.15-16**).

3.3 Progress towards the project Outcome

Outcome: Strengthened local capacity for sustainable management of marine resources underpins decisions on fisheries diversification and MPAs, and informs an enhanced understanding of impacts of invasive marine species and climate change.

With the medical treatment of the Tristan Fisheries Director requiring the first year of the project to be repeated, the alternative employment of key project staff, the devastating Tristan storms of 2019 and now COVID-19 lockdowns in 2020, this project is not as far advanced as anticipated at this stage. However, the active engagement of the government of Tristan da Cunha in adapting activities shows the government's willingness to better understand and manage their marine resources in the long term.

The affects of the COVID-19 virus will determine whether we achieve the Outcome by the end of funding, but the impact from the damage done to monitoring equipment in Year 2 will undoubtedly and unfortunately limit the scale of findings possible in Year 3. As well as the current lockdowns (Tristan has barred all vessels, and South Africa has implemented one of the world's strictest border closures), it is very likely that there will be considerably fewer vessels visiting Tristan over the coming year. This is both for quarantine purposes, but also because the fishing company now has a large surplus of lobster in storage which it will need to sell before fishing further. Getting staff and/or supplies to/from the island could therefore be a major

challenge. The project manager, Andy Schofield, also had to take furlough under the UK Government scheme on 15th April due to personal childcare circumstances.

The indicators are considered to be adequate in measuring the achievement of the project Outcome.

Outcome indicators:

0.1 Local managers making better-informed decisions regarding long-term sustainability and diversification of the lobster fishery and protection of Tristan's marine zone.

As a direct result of the Fisheries Director trip to California the Fisheries Management Plan has been updated (**Annex 3.19**). The lobster fishery passed its MSC surveillance review in June 2019 (https://fisheries.msc.org/en/fisheries/tristan-da-cunha-rock-lobster/@@assessments), with particular recognition of progress on 'improving the Fisheries Management Plan in 2019'. The data collected during the project will enable better-informed decision-making, particularly in terms of determining priority habitats for lobster via investigating previously under-recorded habitats and understanding the impact of tagging. The data collected in the coming year under Output 2 will assist with setting lobster fishing quotas and therefore improve sustainable management. The Fisheries Director has been elected Chief Islander since the project started and, with regard to diversification and wider protections, lead the Island Council in autumn 2019 to decide upon a whole-EEZ bottom-trawling ban, a newly reduced and more sustainable quota for the bluenose fishery, and far-reaching marine protections for Tristan to announce in 2020.

0.2 Local staff continue collecting robust data to inform fisheries management and to monitor changes in marine ecosystems

Local staff have received training in a wide range of collection methods including the use of tagging, data loggers, invertebrate panels, fishing techniques, survey techniques, identification, data analysis, database management, diving, camera deployment and analysis, kelp mapping and dissection (**see Section 3.1 for evidence**). This training underpins the collection of robust data that will inform fisheries management in the future. Whilst some data has been collected (e.g. on habitat and species distribution, and on invasive species), the availability of staff, unpredictability of the weather and failure of equipment have impacted the consistency of data collection which limits the conclusions which can be drawn from it.

0.3 The impacts of new invasive species and climate change on Tristan's marine ecosystems and lobster fishery are quantified and monitored;

Some progress has been made towards monitoring of the invasive porgy (distribution, abundance, reproductive analysis) (**Annex 3.9)**, with their presence being confirmed at both Nightingale and Inaccessible. Analysis has revealed that there is unlikely to be a niche overlap between the invasive porgy and fivefinger (**Annex 3.8**). The monitoring of potential invasive invertebrates has been unsuccessful due to damage to equipment. Further data is required to quantify the impact of new invasive species on lobster fisheries, but given the equipment setbacks this year, it will prove challenging to draw conclusions in the project's final year.

In terms of climate change, a reasonable amount of data has been collected on habitats, kelp and plankton (**Annex 3.8, 3.18** and **3.12**) to set a baseline for future monitoring activities and the number of sites monitored increasing to six. Measuring of sea-surface temperature has been unsuccessful due to equipment failures and damage. In the coming year this data will undergo analysis to determine the potential impacts of climate change on the lobster fishery and marine environment, as far as is feasible.

0.4. Current marine management plans are refined and prioritised based on relative importance of future impacts and implemented by TdC Government in annual work planning.

The Fisheries Management Plan (**Annex 3.19**) has been updated as a result of the capacity building activities (**Annex 3.17**), with positive recognition from the Marine Stewardship Council. The Marine Protection Strategy has also been updated (see Outcome indicator **0.5**). Based on the research findings of the project (**Annex 3.8**) a review of these plans will be undertaken to determine whether they need further refinement.

0.5 Appropriate levels of protection for Tristan's marine zone are defined, based on robust scientific data and stakeholder/expert consultation

This output will be exceeded. The development of the Marine Protection Strategy is underway with a number of options presented with a strong and highly collaborative evidence base, as well as expert and stakeholder consultation incorporated into the process (**Annex 3.14** and **3.13**). After numerous workshops and consultation meetings over the course of 2019, in September Island Council established a new marine protection strategy within the Exclusive Economic Zone (EEZ) including no further bottom trawling, an increase in no-take zones to at least 45% of the EEZ and a revision of licencing terms. This will be publicly announced later in 2020. Before the project commenced, Tristan da Cunha was one of just three Overseas Territories with zero Marine Protected Areas. It is now on course to have a fully-protected marine reserve at least 1.5 times the size of the UK mainland, and the largest fully-protected reserve in the Atlantic.

3.4 Monitoring of assumptions

There have been no changes in the earlier identified assumptions and most have held true, with two exceptions:

- **Capacity is retained on island (either by people staying or training being shared)** A key intended dive-training recipient has moved off Tristan, whilst all three of the UK-based expert consultants, with longstanding familiarity with Tristan, have now left the project. This turnover has significantly impacted the project in terms of continuity of the knowledge in project design and skills.
- **Weather conditions allow survey and monitoring work.** On several occasions the weather has severely impacted the ability to carry out surveying and monitoring work. Tristan da Cunha was hit by two storms in 2019 and the variability in weather has impeded project progress

Tristan da Cunha is an incredibly challenging location and environment to work and has very limited access which can impinge on the project greatly. These risks are mitigated against as much as possible but are often out of any control.

In light of COVID-19, an additional assumption is that islanders are able to travel to Cape Town to receive training and that equipment and materials are able to be delivered to Tristan.

4. Project support to environmental and/or climate outcomes in the UKOTs

The project is roughly halfway on what was set out in the application and we are beginning to understand what are the best methods to use at Tristan. The biggest achievement to date will be the implementation of a Marine Protection Strategy later this year, with full support of Island Council and the wider community. This has been a collaborative and science-based process, fulfilling Tristan's commitment to the UK Government Blue Belt programme to develop a marine protection regime for the entirety of its EEZ by 2020. As the UK's accession to the Convention on Biological Diversity has been extended to Tristan da Cunha, Tristan has an obligation under the 2020 Aichi Targets to ensure the sustainable use of fish stocks (Target 6), address invasive alien species (Target 9) and also contribute to the 10% Marine Protected Areas target (Target 11). The project has contributed towards all three. The waters around Inaccessible Island are also part of the UNESCO World Heritage Site, so the studies conducted there contribute towards Tristan's obligations under the World Heritage Convention.

5. OPTIONAL: Consideration of gender equality issues

N/A

6. Monitoring and evaluation

A major change in project design occurred at the beginning of the project as a result of Tristan Director of Fisheries having to go off-island for several months to receive medical treatment. In

addition, the main qualified fisheries biologist left the project due to accepting a full-time position elsewhere. This has impacted the project, as knowledge of project design and technical expertise was lost (e.g. the installation of fishing activity monitoring technology on the powerboats operating at Tristan). This resulted in the project being rescheduled and a one-year extension approved by Darwin. Further difficulties have been experienced during project delivery in 2019-20 which will be reflected in a revised M&E plan for 2020-21.

The Monitoring and Evaluation work is the responsibility of the Project Leader of the lead organisation but is supported by James Glass at the Fisheries department as the vast majority of activity takes place on-the-ground in Tristan. Information is shared amongst partners via e-mail and regular conference calls. Information is shared with wider stakeholders via emails, meetings and newsletters.

Indicators of achievement are:

- An increase in the capacity of local staff, this is being measured quantitatively in terms of number of people trained and qualitative evidence (e.g. trainers reports) to ascertain skill levels
- Increased understanding in relation to invasive species, climate change, habitat assemblages, species distribution and rock lobster ecology. These are being measured quantitatively through data collection, and the production of reports
- Improved management of the marine environment which is being measured through policy decisions on a strategic level (e.g. the establishment of a Marine Protected Area) and practices implemented by the Fisheries staff

7. Lessons learnt

Tristan is quite unique in its situation being the remotest inhabited island group in the world and brings specific challenges to project management. Although this project benefitted from the experience of previous Darwin projects on Tristan, project managers were still aware of the major challenges. In particular, appointing staff suited to work on Tristan, transport to and from the island, and poor internet are continuing challenges through this and all Tristan projects.

On the plus side, having equipment provided by previous Darwin projects has provided a lasting legacy, contributed to the sustainability of previous projects and positively benefitted the current project as the capacity to carry out monitoring activities had already been developed. Having dedicated Tristanian Fisheries Department staff with assistance from the fishing company have also been an enormous benefit.

Specific lessons learnt during the project;

- In future, more than one external researcher research consultant should be familiar with the project design, to minimise delays and disruption to the project should there be staff changeover.

- It is important for external researchers to have enough time on island to build momentum and knowledge, and to maximise project progress by taking advantage of all possible good-weather days. Even with three months on-island, Rob was unable to undertake all the diving that had been hoped for.

- The logistical challenges faced at the start of this project emphasise how difficult it can be to adhere to project timescales on an extremely remote island, where weather and transport restrictions can quickly set you back months.

- Time is critical. It is critical to build in a substantial time contingency in to mitigate delays and minimise risks to achieving project objectives. Factors outside of the projects control (such as weather, staff changeover and sourcing appropriate expertise) can have real impacts on the project timelines. This also impacts financial management as delays may require the carry-over of funds. For example, changes in shipping

schedules, last-minute berths changes due to medevacs or weather can suddenly cost the project months of crucial time and money rescheduling.

It must be said that Darwin have been unbelievably understanding and accommodating in all the issues that we have had over the project period and their flexibility in extending the project by a year will help us achieve more of the project objectives. The setback now will be the impacts of COVID-19, of which no one has any control.

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

The following comments were provided in the review of last year's annual report:

1. *Financial information should be provided.*

   Financial information for 2018-19 was provided after submission of the report. All but one of the invoices from our partner has been accounted for but due to this delayed timeline and the capacity of the financial department, the financial information was not able to be included in this Annual Report. Financial information will be provided to Darwin as soon as possible.

2. *Whilst project reporting is clear, the project has not fully utilised evidence and indicators and should do so in its next full report to clearly demonstrate progress and attribution.*

   Evidence and indicators have been incorporated into this Annual Report, and progress towards indicators has been clearly outlined.

3. *Refer to logframe and logframe indicators in reporting. Indicators need to be specific and measurable for the output in question, with a clear idea of how to collect and present the data.*

4. Logframe outputs and indicators are referred to when reporting on progress (see Section 3). Indicators will be reframed to improve tracking of project progress and to model the impacts of COVID-19.*Make use of project workplan or Gantt chart to highlight project progress/delays.*

   Delays and progress have been highlighted (see Section 3). A workplan will be developed for the final year of project delivery.

5. *The project should clearly set baselines for indicators in the project logframe to enhance its M&E.*

   Baseline data has been collected against indicators. Under reframing the project for 2020-21, baselines will be clearly set.

6. *The project can enhance its reporting on Darwin Identity and outcomes in the UKOT through the use of evidence.*

   Evidence has been provided under Section 11. Further evidence will be provided in the final project report.

   Reference to the project exit strategy needs to be made.

   Reference to the exit strategy is made in Section 10, Sustainability and Legacy.

7. *The lack of qualified divers for research could inhibit the project moving forward. Is the project able to highlight a revised timeline for diving training?*

   As described in Section 3, a total of 2 islanders received further training and experience in diving. Sufficient personnel were available to complete the diving objectives during Sep–Dec 2018 and Nov 2019–Feb 2020. The majority of fieldwork (including continued data collection beyond the project lifetime) is surface based, partly in recognition of the limited availability of experienced divers. Only deep water transects need the expertise of an experienced diver. Diving training is planned to continue in 2020-21 and a revised timeline will be developed shortly.

8. *If the project continues to experience difficulties, the project should consider a revision to its M&E approach, logframe and indicators to reflect this change in the project.*

The project has experienced some difficulties over the past year: in particular with weather, transport and availability of personnel. As a result, the project will amend the logframe and indicators to reflect changes within the project and strengthen the M&E approach for the final year of delivery.

9. Other comments on progress not covered elsewhere

During the 2019-20 FY the Fisheries Department did not have a full complement of staff until August.

Due to the storms in July and November 2019, many of the days with suitable weather to undertake project activities have been used to repair the damage as a priority (e.g. repairing schools and Government buildings) and the vessels re-appropriated to carry essential materials. Unfortunately, this has limited project progress in some areas.

Tristan closed its port to all vessels early March due to COVID-19, resulting in project work stalling slightly. The Fisheries Department have been allocated 500ltrs fuel which has the potential to restrict field work; further fuel is anticipated to arrive in June 2019 but this cannot be guaranteed. Additionally, the fishing vessel schedule will likely be impacted in response to a reduced market demand for lobster stock. This will decrease the number of opportunities to collect data.

The project manager, Andy Schofield, also had to take furlough under the UK Government scheme on 15th April due to personal childcare circumstances.

10. Sustainability and legacy

There has been a strong awareness in the Tristan community of the project and the work being conducted as part of it. During the first year, 5 Fisheries staff attended presentations about the project and it has been explained at Fisheries Council Committee meetings, and the fortnightly Head of Government Department meetings. The prize draw, advertising for porgy samples, indirectly acts as project promotion, as it has been advertised in the wider Tristan community.

The RSPB team has been working closely with the Fisheries Department on-island, and there is a strong commitment to continuing the work after Darwin funding ends in 2021. The long-term monitoring and data collection, set up as a result of the project, will continue and the benefits of this work will be realised in the future (particularly in reference to climate change and sustainable fishing). Tristan is so small that limitations in equipment and numbers of people are real restrictions in terms of carrying out basic work such as monitoring. The supply of a RIB vessel, the '*Jasus tristani'* (the Latin name for the Tristan spiny lobster) during the last Darwin Marine project has made a huge difference to this project, making the Fisheries Department more independent, and providing a legacy which will last for many years beyond 2021. This extra boat has significantly assisted the Fisheries Department in monitoring the fishery and carrying out the project objectives. It has already saved the Fisheries Department in boat hire fees, and now stands in an inshore support rescue boat alongside the Fishery Patrol vessel. As in previous projects, the equipment purchased during the project will remain on-island and provide a basis for other projects to continue to build on.

The legacy of this project will continue to give social, economic, ecological and technical benefits as these projects results will underpin future conservation and fisheries management plans. The outputs of this project have already contributed immensely to the intended implementation of the Marine Protection Strategy which will serve as a substantial sustained legacy.

The Fisheries Department have raised a potential future challenge, which may impact sustainability, beyond the project. Currently, the RSPB provide support on project finances and recruitment. Beyond the project, the RSPB will continue to provide support with recruitment through promoting advertisements, being on interview panels and providing feedback if in-person meetings with potential candidates are required. Financially, it is the RSPB's intention to provide financial training for Tristanians to build their capacity in the long-term.

11. Darwin identity

- The Darwin Initiative logo has been acknowledged on presentations (**Annex 3.4**), and is used on any events held on Tristan, like on species identification training presentations and in the profile on the tristandc.com website. The Darwin Initiative support is a separate project with a clear identity on Tristan.
- There is a good understanding of Darwin on Tristan, although there are only two government departments (Fisheries and Conservation) with a clear understanding of the programme, many members of the community are employed part-time, and so have a great understanding of Darwin. The population of Tristan is very small (currently 243) and there have already been three successful projects leading to increased capacity on Tristan for conservation/fisheries work. Darwin projects are discussed and progress are given at the fortnightly Government Department meetings. The school children are also familiar with the Darwin name from local presentations and discussions from Darwin staff.

12. Safeguarding

The RSPB's Safeguarding policy was updated in 2019 with an employee code of conduct, a whistle-blowing policy and revised training on safeguarding incorporating those updates. RSPB staff on the project have completed this training. No safeguarding concerns have arisen during this reporting year of the project. The safeguarding policies have been shared with the partners on the project.

Tristan da Cunha remains committed to the safeguarding of all children and vulnerable people in all settings.

There is a Safeguarding Policy in place which is fully available to all staff and volunteers at all times. The policy outlines the investigatory and disciplinary processes for when a disclosure is made. Staff and volunteers are required to read and understand this policy prior to commencing work with the project. This policy is available to be shared with all downstream partners as required.

Safeguarding training has not previously been available to project staff. Tristan da Cunha have now employed a Social Worker who is able to provide Safeguarding Training for all staff and volunteers. In the year 2019/2020 no safeguarding concerns have been raised by staff, volunteers or beneficiaries of the project. In the event of a concern all staff and volunteers are aware of Safeguarding Policy and the required action to be taken. The project manager is the first point of contact for any safeguarding concerns and would ensure any concerns or incident was appropriately recorded in the project Safeguarding Log. There is a Generic Social Worker based on Tristan da Cunha until 2022 who is available to provide training, advice and guidance as required.

Tristan da Cunha is a small community (250 residents). The government Tristan da Cunha have an existing Whistle Blowing policy in place which is the method by which all island professionals, including those working on the Darwin Initiative project are supported and encouraged to raise concerns appropriately and safely.

13. Project expenditure

Table 1: Project expenditure <u>during the reporting period</u> (1 April 2019 – 31 March 2020)

Project spend (indicative) in this financial year	**2019/20 D+ Grant (£)**	**2019/20 Total actual D+ Costs (£)**	**Variance %**	**Comments (please explain significant variances)**
Staff costs				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Others (Please specify)				
TOTAL				

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2019-2020–if appropriate

Project summary	Measurable Indicators	Progress and Achievements April 2019 – March 2020	Actions required/planned for next period
Impact: The marine environment is managed to sustain local livelihoods, while conserving biodiversity and natural resources, and monitoring for potential effects of invasive species, climate change and other anthropogenic impacts.		Collection of baseline data to monitor for potential effects of invasive species and climate change, and the building of capacity in Tristan to manage the marine environment.	
Outcome: Strengthened local capacity for sustainable management of marine resources underpins decisions on fisheries diversification and MPAs, and informs an enhanced understanding of impacts of invasive marine species and climate change.	0.1 Local managers making better-informed decisions regarding long-term sustainability and diversification of the lobster fishery and protection of Tristan's marine zone. 0.2 Local staff continue collecting robust data to informs fisheries management and to monitor changes in marine ecosystems 0.3 The impacts of new invasive species and climate change on Tristan's marine ecosystems and lobster fishery are quantified and monitored; 0.4. Current marine management plans are refined and prioritised based on relative importance of future impacts and implemented	See Section 3.3. The Fisheries Management Plan has been updated (**Annex 3.19**). The lobster fishery passed its MSC surveillance review in June 2019 (https://fisheries.msc.org/en/fisheries/tristan-da-cunha-rock-lobster/@@assessments), with particular recognition of progress on 'improving the Fisheries Management Plan in 2019'. The Fisheries Director has been elected Chief Islander since the project started and, with regard to diversification and wider protections, lead the Island Council in autumn 2019 to decide upon a whole-EEZ bottom-trawling ban, a newly reduced and more sustainable quota for the bluenose fishery, and far-reaching marine protections for Tristan to announce in 2020. Local staff have received training in a wide range of collection methods	Continuation of data collection to improve understanding on invasive species, climate change and management of the marine environment. Training activities are continued in diving and survey methods. Decisions for the marine protection strategy are implemented.

	by TdC Government in annual work planning. 0.5 Appropriate levels of protection for Tristan's marine zone are defined, based on robust scientific data and stakeholder/expert consultation	Some progress has been made towards monitoring of the invasive porgy (distribution, abundance, reproductive analysis) (**Annex 3.9)**, with their presence being confirmed at both Nightingale and Inaccessible. In terms of climate change, a reasonable amount of data has been collected on habitats, kelp and plankton (**Annex 3.12**-**3.18**) to set a baseline for future monitoring activities. Tristan da Cunha is now on course to have a fully-protected marine reserve at least 1.5 times the size of the UK mainland, and the largest fully-protected reserve in the Atlantic.	
Output 1. Improved local capacity 1.1 Study trip to a country managing a sustainable rock lobster fishery (possibly Tasmania) and with MPAs, for Director of Fisheries and researcher. 1.2 Fisheries observer training in Cape Town for 3 islanders, on fishing methods for species other than rock lobsters. 1.3. Continued training for islanders in fisheries data gathering, processing and use for fisheries modelling. 1.4 Further training and dive experience for 3 islanders on Tristan. 1.5. Continued and expanded training and involvement in marine survey methods for 5 islanders, including recording, identification, data processing etc		1.1 The Director of Fisheries and Project partner RSPB visited an MPA and the Marine Science Institute at the University of California. 1.2 One Fishery observer had PST training in South Africa, and was schedule to do more training whilst in South Africa during March, this was postpone due to the COVID-19 lockdown. (certificates Annex 3.1**).** 1.3Data handling and requisition training was given to fisheries staff during the visit of CEFAS researcher to Tristan during August-October 2019, and again by Rob another marine biologist during his visit to Tristan November 2019-Febuary 2020.	1.1 Objective completed no further action. The trip experience has proved invaluable and will feed in to the future Tristan MPA that will be implemented later in the year (2020). 1.2 Two observers are planned to have training in South Africa during this FY, although it will depend on travel restrictions during 2020/21and the COVID-19 virus. 1.3 Data handling and requisition training will continue during the final visit of a marine biologist

	1.4 One islander received additional training and experience by undertaking surveys with the visiting marine biologist Nov-Feb 2020. Also, one Conservation Department staff member who had previously received some informal dive training on Tristan did a combined introductory/refresher dive (based on guidelines for the PADI ReActivate programme for certified divers) with the visiting marine biologist who was also a diving instructor. 1.5Identification training on the most common groups of animals and seaweeds was given to Fisheries staff during the scientist visit Nov-Feb 2020.	during this FY, January - March 2021. 1.4 Additional dive training and experience will be given to islanders on Tristan, during the visit of a marine biologist during the summer January - March 2021. 1.5 Training on surveys will be given to Fisheries staff, during the visit of a marine biologist to Tristan during January - March 2021.
Output 2. Improved fisheries monitoring 2.1. Procure and install fishing activity monitoring technology on local Tristan fishing boats to improve accuracy of fishing effort data, essential for sustainable fisheries management. 2.2. Construction of holding tank facility on Tristan. Experiments to determine the effects of various tags and tagging methods on the lobsters to reduce mortality and tag loss.	2.1 Monitoring technology equipment was tried both on the vessel and a local fishing boat at Tristan, although there was problems with the solar battery and software, which has now been sorted.	2.1Procurement and installation of monitoring technology on the local Tristan fishing boats will occur during July - March 2021.

	2.2 The construction of a holding tank facility on Tristan was removed from the project. A tag mortality study was carried out on the vessel Geo Searcher during September – January 2020.	2.2 The tag mortality study, will continue on the vessel Geo Searcher between September 2020 – March 2021 (and will continue as long as there is quota to be caught).
Output 3. Improved information base on Tristan lobster life history and ecology 3.1. Sample lobster pueruli larvae using pueruli traps, in-water surveys and plankton hauls to improve understanding of seasonal/annual abundance and to inform modelling 3.2. Assess Pueruli habitat preferences through underwater searches; traps with different materials. 3.3. Continue assessment of juvenile lobster/fish food supply through surveying smaller biota of different habitats, depths, types of seaweed cover through analysis of turf samples. 3.4. Assess dietary requirements of adult lobsters through further gut content analysis and recording of night time foraging behaviour. 3.5. Acquire basic data on under-recorded habitats, particularly life on the deeper seabed at 30-100m (depths affected by the lobster fishery), and on cobble/pebbles (probably an important refuge habitat for larval lobsters and adults feeding)	3.1 & 3.2 Inshore plankton samples continue to be collected, to be analyse by the specialised plankton team at CEFAS. (**DPLUS**). 3.3 & 3.4 Materials for the making of new lobster traps did not arrive, so no new methods were tried this season. 3.4 & 3.5 Since the start of the project, researchers at the University of Cape Town conducted a detailed study of the diet of 540 adult lobsters from the Tristan group (Jones, L.D.S. (2018) *Diet of the Tristan rock lobster* Jasus tristani *following the 2011 soya spill at Nightingale Island*. MSc Thesis, University of Cape Town. 55 pp).	3.1 Plankton hauls will continue whenever the fisheries RIB does research trips to sea, throughout the project. These will be sent to CEFAS at the end of the project to be analyse. 3.2 & 3.3 Pueruli habitat sampling to continue as soon as materials arrive September 2020 – March 2021. 3.4 Dietary requirements of adult lobsters completed. no further action. Night time foraging behaviour to be conducted between September 2020 – March 2021. Waiting for lights for the BRUV frame

		3.5 Camera work (BRUV) work will continue throughout the duration of the project. Also the deepwater camera purchase last year is in operation
Output 4. Invasive non-native species impacts 4.1. Study reproductive state and diet of the invasive porgy fish through trapping (gill and/or seine netting) and dissection of large sample. 4.2. Surveys to assess current geographical distribution of invasive porgy across Tristan main island, and presence/absence at Nightingale and Inaccessible. 4.3. Surveys of porgy abundance/distribution at selected sites; assess population structure (sizes, sex ratios), reproductive cycles (gonad visual inspection and preservation for later histological analysis) and dietary overlap with native species e.g. fivefinger (gut contents analysis); establish regular sampling protocols 4.4 Surveys to look for new settlement of invasive mussels *Mytilus galloprovincialis* from the wreck of the *Oliva* in 2011, both shore and subtidal, at Nightingale 4.5. Surveys to continue checking for establishment of invertebrates from the rig stranding in 2006, especially at sites near Trypot; implement checks on hulls of yachts visiting Tristan; install PVC settlement tiles at a number of accessible sites (monitor using underwater photography).	4.1 & 4.3). 11 South American silver porgy (*Diplodus argenteus*), were sampled during 2019/20 to provided additional data on population structure, reproductive cycles and diet of this non-native species in Tristan waters. 4.2 & 4.3).During this period a total of 24 Baited Remote Underwater Video (BRUV) surveys were carried out at six locations across Tristan, Nightingale and Inaccessible islands between July and February 2020, monitoring the distribution and relative abundances of fish species, including the porgy. 4.4 The panels deployed in November 2018 to monitor invertebrate settlement were lost from their mooring, likely as a result of one of the severe storms that Tristan experienced during 2019. As in the previous year, poor sea conditions prevented any attempt to survey the MV Oliva wreck for non-native species, including the mussel *Mytilus galloprovincialis*	4.1 4 Samples continue to be collected and will be analyse, on-going throughout the project. 4.2 & 4.3 Surveys will continue throughout the project to assess the current geographical distribution of invasive porgy at the Tristan group. 4.4 Dive surveys are planned at the wreck of the *Oliva* during the visit of the marine biologist to Tristan during January - March 2021. (summer).

	4.5 Time availability and poor weather conditions prevented any subtidal surveys been conducted at Trypot for non-native species.	4.5 Checking for the establishment of invertebrates from the rig stranding in 2006, at Trypot; will continue during the visit a marine biologist to Tristan during January - March 2021 (summer).
Output 5. Climate change impacts 5.1. Map habitats using existing and new survey data 5.2. Establish methods for mapping giant kelp cover and assessing biomass; tracking changes in response to local- and large-scale environmental stressors. Establish methods and sites for assessing kelp growth and condition (possible early indicators of stress), and seasonal changes 5.3. Expand long-term climate change impact monitoring sites using methods developed in other South Atlantic UKOTs 5.4. Study seasonal/annual changes in plankton ecology/populations through regular hauls, record abundance and composition, preserve. (see also 3.2). Look at possible differences between Tristan & Nightingale, especially in summer when Subtropical Front possibly present.	5.1 & 5.2 Mapping of giant kelp (*Macrocystis pyrifera*) by plotting GPS waypoints has been established. A long-term monitoring of kelp extent via satellite images and ground truthing is also being developed as a long term monitoring tool. 5.3 A survey protocol has been developed with methods used in other South Atlantic UKOTs, and is on-going. 5.4 A total of 20 inshore plankton samples were collected, all of which were partially analysed, to be sent to CEFAS . 5.5 Two temperature loggers currently deployed at Tristan was destroyed as well as one at Nightingale island this year, two remain at Gough island.	5.1& 5.2 Habitat mapping and assessing kelp growth of giant kelp (*Macrocystis pyrifera*) will continue during the visit of the marine biologist January - March 2021. It is also the intention to use drone footage. 5.3 & 5.4 Underwater photographic survey transects, and plankton hauls will continue during the visit of the marine biologist January - March 2021. (summer). To be repeated into the future. 5.5 Divers to deploy more sea surface temperature loggers ASAP and retrieve data will continue throughout the project and into the future.

5.5 Continued collection of long-term sea surface temperature data and collection of data from subtidal data loggers.		
Output 6. Towards MPA establishment 6.1. Fact-finding visit for Director of Fisheries to another country with appropriate MPAs and fisheries, to establish how they may be managed together. The trip will also include time in the UK meeting with relevant organisations and individuals. 6.2. Map and collate existing data to identify biodiversity hotspots. 6.3. Acquire data on the biota of deeper water. A comprehensive survey of the seabed in waters below 30m is beyond the scope of this project, but preliminary information will be recorded using GoPro cameras in underwater housings depth-rated to 1,500m. 6.4. Hold workshops/meetings on/off Tristan as appropriate to discuss MPA establishment at Tristan, aims and mechanisms.	6.1Director of Fisheries visited the UK and had meetings with CEFAS, RSPB, FCO and MMO to discuss MPA options during May 2019. 6.2 As part of Bluebelt BAS has made three visits to Tristan collecting data, and RSPB has collated existing data and identify biodiversity hotspots (Seals, Birds etc) within Tristan's EEZ, the results were compile for Island Council which helped them decide what MPA they would like for Tristan. 6.3A deep water housing was purchased and have been used giving us the first photo footage below 30m 6.4 Island Council have agreed a MPA, and await news from the UK, if this area can be extended, if an option of an endowment fund is agreed.	6.1 & 6.4 Island Council have made recommendations on a MPA, to be implemented later in the year. 6.2 Objective completed by RSPB. 6.3 The deep water camera will be used during the 2020/21 FY, and into the future. 6.4 Announcement of Marine protected strategy to be in place between (June and August)

Annex 2: Project's full current logframe as presented in the application form (unless changes have been agreed) - <u>if appropriate</u>

N.B. if your application's logframe is presented in a different format in your application, please transpose into the below template. Please feel free to contact Darwin-Projects@ltsi.co.uk if you have any questions regarding this.

Project summary	Measurable Indicators	Means of verification	Important Assumptions
Impact: (Max 30 words) The marine environment is managed to sustain local livelihoods, while conserving biodiversity and natural resources, and monitoring for potential effects of invasive species, climate change and other anthropogenic impacts.			
Outcome: (Max 30 words) Strengthened local capacity for sustainable management of marine resources underpins decisions on fisheries diversification and MPA's and informs an enhanced understanding of impacts of invasive marine species and climate change.	0.1 Local managers making better-informed decisions regarding long-term sustainability and diversification of the lobster fishery and protection of Tristan's marine zone. 0.2 Local staff continue collecting robust data to informs fisheries management and to monitor changes in marine ecosystems 0.3 The impacts of new invasive species and climate change on Tristan's marine ecosystems and lobster fishery are quantified and monitored; 0.4. Current marine management plans are refined and prioritised based on relative importance of future impacts and implemented by TdC Government in annual work planning. 0.5 Appropriate levels of protection for Tristan's marine zone are defined, based on robust scientific data and stakeholder/expert consultation	0.1 Refined fisheries quotas and methods are refined, MSC accreditation. 0.2 Existing fisheries and marine environmental datasets, annual scientific monitoring reports submitted to TdC Government 0.3 Annual reports and/or peer-reviewed journal articles on status of invasive species and responses of native species to environmental change; 0.4 Updated management plan(s), TDC annual work plans 0.5 Species/habitat distribution 'hotspot maps in management plans.	Capacity is retained on island (either by people staying or training being shared).

		0.5 Workshops/conferences led by local managers and stakeholders, in consultation with experts; report detailing recommendations for MPA	
Outputs			
1.Tristan da Cunha has greater local capacity to manage its marine resources sustainably	1.1 Fisheries Manager on TdC and fisheries specialist post-holder use international learning to update Tristan da Cunha Lobster Management Plan. 1.2. Three TdC fisheries observers trained in other fishing techniques appropriate to fisheries diversification at Tristan to allow for proper monitoring control and enforcement of all fishing activities in the Tristan Maritime Zone. 1.3. Further training for islanders in fisheries data collection and processing. 1.4. Two islanders undergo further dive training and experience on-island. 1.5. Five islanders trained in new survey techniques, demonstrate ability to collect monitoring data of sufficient standard. 1.6. An integrated database is established for storing/querying fisheries and marine environmental data, and all related metadata.	1.1. Trip 'diary' and thoughts/conclusions written up by participant(s). Lobster management Plan 1.2. Course certification by training organisation in Cape Town and the MMO in the UK. 1.3. Report from trainer(s). 1.4. Diving logbooks updated, qualification certificates/cards, training report. 1.5 Training reports, individual performance reports, informal assessment by researchers and supervisors, data sheets completed. 1.6. Database established, and islanders able to interrogate.	Appropriate country willing to host fisheries/MPA study trip and external organisations agree to host fisheries staff members for extended periods of time. New additional observers/surveyors are available and willing to undertake training. Suitably qualified and experienced personnel can be recruited to conduct training. Capacity building is retained on island (either by people staying or training being shared)

2. The monitoring and modelling of the lobster fishery is improved through research and the introduction of new technology.	2.1. The estimation of fishing effort on Tristan is improved by procuring and installing fishing activity monitoring technology on the powerboats operating at Tristan. 2.2. The impact of tagging Tristan lobsters is reduced by undertaking an extended study of tagged lobster in captivity	2.1 Operational data loggers and trap tags installed on all Tristan fishing vessels. Data used for improved fisheries management and stock assessment. 2.2 Lobster holding facility built; lobster tagging study report and peer-reviewed journal article; tagging methods adjusted	Suitably qualified and experienced researchers can be recruited Fishers willing to cooperate with new technology trials Lobster holding facility can be built on-island, or suitable facility identified in Cape Town. **(Removed from Project, Tagging study done on vessel at sea)**
	3.1. Lobster larval abundance in inshore and offshore waters is determined by plankton net hauls 3.2. Methods for monitoring lobster larval settlement developed 3.3. Information obtained on distribution and habitat preferences of lobster, kelp and other key species.	3.1 Lobster data sheets, preserved samples, reports, species distribution maps, published papers 3.2 Standard Operating Procedures (SOP) document 3,3 Survey forms, photographs, survey reports, species distribution maps, published papers. Data being used to inform stock management.	Suitably qualified and experienced researchers can be recruited Weather conditions allow survey and monitoring work Access to a suitable platform for offshore sampling is available
4. The status of invasive marine species and their potential impacts on native ecosystems are determined, and monitoring protocols established.	4.1. Surveys of distribution and abundance of South American silver porgy at Tristan, and for presence at Nightingale and Inaccessible. 4.2. At least 100 porgy sampled for diet and reproductive analysis. 4.3. Information gathered on porgy population structure and dynamics by monitoring regularly at selected sites.	4.1 and 4.2. Porgy data sheets, photographs, preserved samples, species distribution maps, survey reports, peer-reviewed paper on distribution/biology. 4.3 Survey reports, photographs.	Weather conditions allow survey and monitoring work.

	4.4. Surveys for presence of non-native benthic invertebrates, especially in the harbour, the vicinity of Trypot (rig stranding) and Nightingale (*Oliva* wreck). 4.5. Settlement panels for detecting non-native benthic invertebrates deployed for period of project.	4.4 Survey reports, photographs, dive logs. 4.5. Report of results, list of settled invertebrate species (native and non-native), SOPs.	
5. Habitat and species distributions are mapped and monitored to assess potential effects of climate change	5.1. Habitat mapping methods researched, trialled and established. 5.2. Baseline data on kelp biomass, condition and growth rates collected at representative inshore sites. 5.3. Number of subtidal monitoring sites increased to six, encompassing multiple islands and habitat types. 5.4. Inshore and offshore plankton samples from at least two different seasons collected and analysed. 5.5. Additional data loggers deployed in the subtidal.	5.1 Research reports, survey reports, inshore habitat and species maps, SOPs. 5.2 Data sheets, photographs, survey reports, ground-truthed kelp habitat. maps 5.3 SOPs, long-term survey schedule, evidence of training in monitoring techniques (see output 1). 5.4 Preserved plankton samples, species lists and photographs, report on plankton composition. 5.5. Data retrieved from loggers.	Suitably qualified and experienced researchers can be recruited. Weather conditions allow survey and monitoring work. Access to a suitable platform for offshore sampling is available.
6. Tristan da Cunha has greater local capacity to prepare for large scale Marine Protected Area Management	6.1. Fisheries Manager on TdC visits an appropriate MPA with diverse zonation scheme, and on return develops report on conditions for the development of an MPA for Tristan da Cunha with training management team and stakeholders. 6.2. Biodiversity 'hotspots' identified through mapping of habitats and species from survey data, to facilitate MPA planning. 6.3. Data acquired on biota of deeper water and other data-deficient habitats. 6.4. Workshops and/or phone conferences held on/off island as appropriate to discuss MPA establishment at Tristan.	6.1. Trip 'diary' and thoughts/conclusions written up by participant(s), Tristan da Cunha MPA report. 6.2. Report on biodiversity mapping and MPA recommendations. 6.3. Deep water survey results and report on gap-filling habitat/species surveys. 6.4. MPA Workshop reports.	Appropriate country willing to host fisheries/MPA study trip.

Annex 3 Onwards – supplementary material

Checklist for submission

	Check
Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	
Is your report more than 10MB? If so, please discuss with Darwin-Projects@ltsi.co.uk about the best way to deliver the report, putting the project number in the Subject line.	
Have you included means of verification? You need not submit every project document, but the main outputs and a selection of the others would strengthen the report.	
Do you have hard copies of material you want to submit with the report? If so, please make this clear in the covering email and ensure all material is marked with the project number. However, we would expect that most material will now be electronic.	
Have you involved your partners in preparation of the report and named the main contributors	
Have you completed the Project Expenditure table fully?	
Do not include claim forms or other communications with this report.	