Darwin Plus:
Overseas Territories Environment and Climate Fund
Annual Report

To be completed with reference to the "Writing a Darwin/IWT Report" Information Note: (https://dplus.darwininitiative.org.uk/resources/reporting-forms-change-request-forms-and-terms-and-conditions/). It is expected that this report will be a **maximum** of 20 pages in length, excluding annexes)

Submission Deadline: 30th April 2021

Darwin Plus Project Information

Project reference	DPLUS079
Project title	Improving Sustainability of Marine Management in Montserrat
Territory(ies)	Montserrat
Lead organisation	Cefas
Partner institutions	Government of Montserrat, Waitt Institute
Grant value	£ 321,783.48
Start/end dates of project	01/04/2018 – 31/03/2022
Reporting period (e.g. Apr 2020-Mar 2021) and number (e.g. Annual Report 1, 2)	April 2020 – March 2021 Annual Report 3
Project Leader name	Rachel Mulholland
Project website/blog/social media	@CefasGovUK
Report author(s) and date	Rachel Mulholland, Kerry I'Anson, Jo Smith, Jon Hawes (Cefas) Lavern Rogers-Ryan (Government of Montserrat)

1. Project summary

The project consists of three separate work packages delivering complimentary work streams. These are:

- Training in the assessment of Environmental Impact Assessments (EIA) to help improve management decisions around development projects;
- Producing education materials to contribute to the secondary school syllabus increasing awareness of the marine environment in Montserrat's younger generation;
- Seabed mapping using high resolution data to enable more targeted management of seabed features for sustainable use.

The project will enable the Government of Montserrat (GoM) to improve the management of the marine environment and key marine resources by strengthening the evidence base, local capacity and management tools to inform the sustainable development of Montserrat's marine based economy. Educating the younger generation on marine issues relevant to Montserrat will ensure the future sustainability of their marine environment.

2. Project stakeholders/partners

All partners, in particular GoM, have been engaged at all points of project planning and delivery throughout the reporting year. Regular project meetings are held between Cefas and GoM where high-level updates are provided on each of the project work streams and project level decisions are taken. The minutes from these meetings are provided in Annex 3.

Separate, more informal and ad hoc meetings are held with the relevant staff on the individual work areas and tasks. Emails relating to planning and decisions for these are provided in Annex 3 and Annex 5.

3. Project progress

3.1 Progress in carrying out project Activities

Output 1: Undertake knowledge transfer and build capacity through workshops and training with a minimum of 10 GoM staff from different departments for the duration of the project.

Activity 1.1 includes the project kick off meeting which was completed in Q1 of Year 1, a mid-project meeting which was completed in Year 2, and final project handover meeting which is now due for completion in Q4 of Year 4.

Activity 1.2 has been partially completed, training in video survey techniques was extended throughout the ground-truthing survey undertaken in Year 2 whilst training in analysis will be delivered alongside Activity 1.3 in Year 4.

Activity 1.3 is now due for completion in Year 4.

Activity 1.4 was due to take place in Q1 of Year 3. Three GoM staff members (Director of Environment Ernestine Corbett, Chief Physical Planner Jerome Meade and Environment Officer Stephen Mendes) were booked on the researcher exchange visit. Hotels, flights, and an agenda for this visit had been booked and finalised with participants. However, due to the Covid-19 travel restrictions, this visit had to be cancelled at short notice. This activity has now been moved to Year 4 within the implementation timetable and we are hoping to be able to rearrange this with the same attendees.

Activity 1.5 was completed by the second EIA workshop delivered in Q3 of Year 2.

EIA evaluation support, being delivered under Activity 1.6, is ongoing and due for completion on target by the end of Project Year 4.

Output 2: Create and provide a GIS Database with environmental layers and maps of marine benthic environments in Western shelf waters by quarter three, 2021.

Activity 2.1, review of data and survey design, was fully completed in Year 1. The 14-day video characterisation survey under Activity 2.2 was completed in Q1 of Year 2.

Activity 2.3, the analysis of the survey data, was completed in Q4 of Year 2. Additional evidence to demonstrate the analysis undertaken has been provided in Annex 4.

Activities 2.4 and 2.5 have been completed during this year of the project. A series of emails between Cefas, GoM and the Waitt Institute are provided in Annex 5 which evidence the delivery of characterisation of data layers and the sharing of data between stakeholders.

Activities 2.6 and 2.7 are now due for completion in Year 4.

Output 3: Increase awareness on marine issues affecting Montserrat by creating an educational resource pack to be used within the secondary school. Work closely with the community, providing information and support to current local projects (Aqua Montserrat) and attend community events (St Patricks Day Parade) by March 2021

Activities 3.1 – 3.3 were completed in project Year 1.

Activity 3.4 was completed in project Year 2.

Activity 3.5 covers the second consultation meeting on the draft educational resource pack. This was planned as an in-person event for March 2020. Due to the outbreak of the Covid-19 pandemic and resultant travel restrictions, we were forced to cancel this visit at the last minute (the day before the education team were due to fly out to Montserrat). As a result of this last-minute visit cancellation, we were unable to hold the in-person consultation meetings with the relevant stakeholders on the draft resource pack during Year 2. Due to ongoing restrictions, the team has not been able to rearrange an in-person stakeholder event for this activity during Year 3; however, this consultation was instead planned to be undertaken remotely with

representatives from the Montserrat Secondary School. Unfortunately, due to the sudden death of a key member of the School personnel, this consultation has been put on hold until June.

Activities 3.6 and 3.7 are due for completion in project Year 4.

3.2 Progress towards project Outputs

Output 1: Undertake knowledge transfer and build capacity through workshops and training with a minimum of 10 GoM staff from different departments for the duration of the project.

With regards to seabed imagery analysis and habitat mapping capacity building, the decision has been taken, after discussion with GoM staff via video conference (dated 20/10/2020), to postpone delivery of Activities 1.2 and 1.3 until both workshops can be held in person. This is due to the complexity of the material to be covered, and the difficulty of sharing and working with large environmental datasets (MBES and backscatter) in GIS remotely.

On the EIA aspect of the project, work has been put on hold during Year 3 of the project due to an inability to hold the planned in-country training workshops. All activity under this work area has been moved into project Year 4. The EIA team has, however, maintained communication with partners in GoM and highlighted that project staff are available for discussion or questions on EIA matters throughout the year if needed.

Planning is on hold for the researcher exchange visit to Cefas in the UK for the nominated GoM staff; however, we are hoping to pick this back up in Year 4.

Work has been progressing on the creation of the EIA training pack. This is being designed based on feedback from workshop and training participants on areas where they would appreciate additional guidance. Several EIA guidance documents and other resources have been provided to GoM in Year 3 (evidence provided in Annex 3 and Annex 6). Additional resources have already been prepared for distribution to participants in the researcher exchange visit when this is able to proceed.

We consider that output 1 is on track in terms of deliverables and project timetable against the new 4-Year project timetable. We consider that it is likely to be achieved by the end of the project as long as planned workshops and training visits are able to proceed without hindrance from extended Covid-19 travel restrictions in project Year 4.

Output 2: Create and provide a GIS Database with environmental layers and maps of marine benthic environments in Western shelf waters by quarter three, 2021.

Following completion of the ground-truthing survey in Q1 of Year 2, a shapefile describing the preliminary classification, derived from live annotations, of each survey station, was provided to GoM partners in Year 2. Additional data layers were derived from bathymetry and backscatter data layers which have been used to assist in the final seabed characterisation. An initial segmentation of these layers was performed in Year 2 and the analysed ground-truthing imagery data was received in Q4 Year 2, and quality controlled to ensure accuracy and consistency of faunal identification and enumeration. Annex 4 provides evidence of the completion of this analysis.

Work during Year 3 (Activity 2.3) focussed on multivariate assemblage analyses of the epifaunal biotic data (percentage cover) as derived from the seabed imagery analysis, and predictive mapping of habitats derived from these assemblages.

Assemblage analysis first required truncation, standardisation and transformation of the percentage cover dataset (which included both biotic and physical substrate percentages) as derived from the seabed imagery analysis undertake in Year 2. Truncation of the biotic component of the matrix was undertaken to retain the highest uniquely resolved entry (CATAMI morphotype or taxonomic descriptor). Standardisation of the truncated dataset involved aggregation of percentage cover data from adjacent still images (as a single still image cannot constitute a substantive sample of the seabed). Aggregation was undertaken on still images which were geographically adjacent and had the same primary substrate designation. This standardisation resulted in 122 samples. Hellinger transformation of the standardised percentage cover data was then undertaken to de-skew these abundance data and create a metric distance matrix, as required for k-means clustering. The prepared distance matrix was

then subjected to k-means clustering using the *cascade* function in the R package 'Vegan' (see Annex 4). Further interrogation of the composition of these assemblage clusters was achieved using the Multi-level Pattern Analysis routine (*multipatt()*) of the R package 'indicspecies' (De Caceres et al., 2020). This is a permutational testing routine which permutes the input clusters and compares these combinations against presence of the taxa/substrate in the raw matrix, using the IndVal index as a test statistic (Dufrêne and Legendre, 1997) to measure association to the truncated and standardised percentage cover matrix, and a non-metric multidimensional scaling (nMDS) ordination performed to illustrate cluster membership and overlap. Redundancy Analysis (RDA) was then performed on the Hellinger transformed matrix and the raw percentage substrate cover and depth data to better interpret the environmental drivers of each defined cluster group.

Predictive habitat mapping was then undertaken by first segmenting the multibeam bathymetry and backscatter data (alongside derivatives such as slope, rugosity and bathymetric position index). This segmentation was achieved using Object Based Image Analysis (OBIA) using the "Multi-resolution Segmentation" algorithm in *eCognition v9.3.5*. This divided the area of investigation into meaningful objects (17,938 in total) based on their acoustic and spatial characteristics. The classified ground-truth samples were broken down into their component still images (resulting in 423 classified images). The position of these 423 samples were then overlaid and the objects which intersected these samples were assigned the corresponding class, providing a training dataset for predictive modelling. The classified objects, alongside their acoustic and geomorphological attribute data, were then used to train a variety of predictive models using the "PyCaret" package in Python 3. This package assesses the accuracy of a large number of predictive models and presents the most effective model for tuning and calibration. The final best fit model was determined to be a "CatBoost" classifier model and resulted in a map with a cross validated accuracy of 75.6% and Kapp value of 0.69. A full breakdown of class accuracy and error rates, alongside predictor importance, can be seen alongside the draft predictive map in Annex 5.

The preliminary characterisation was delivered to GoM on 24/12/2020 (see email evidence in Annex 5) as required by Activity 2.5.

A Microsoft Teams meeting to explore the feasibility of combining the ground-truth data acquired during this project with that collected by the Waitt Institute was held on 29/10/2020 (see email evidence in Annex 5). This was attended by Andy Estep (Waitt Institute) and Jon Hawes (Cefas), and the result of which was the provision of further information from Waitt on the benthic classification of their ground truth images. This fulfils Activity 2.4.

Output 3: Increase awareness on marine issues affecting Montserrat by creating an educational resource pack to be used within the secondary school. Work closely with the community, providing information and support to current local projects (Aqua Montserrat) and attend community events (St Patricks Day Parade) by March 2021

A full draft version of the resource pack was completed in Year 2. Consultation was planned to be undertaken remotely with representatives from the Montserrat Secondary School during Year 3. Unfortunately, due to the sudden death of a key member of the School personnel, this consultation has been put on hold until June.

The project Team attended and participated in the St Patrick's Day Festival during Year 1. Due to Covid-19 travel restrictions, the planned visit to participate in the March 2020 festival had to be cancelled at short notice. Due to ongoing restrictions, the 2021 festival did not take place. No in-country visits have been able to proceed this year and, therefore, the team has been unable to participate in any community events during Year 3.

3.3 Progress towards the project Outcome

Progress to towards the outcome is underway.

The draft west coast database (Indicator 0.1) has been built (seabed characterisation and associated environmental layers and derivatives) and shared with GoM for comment. A final database will be refined in consultation with GoM prior to final delivery in Q3 of Year 4 and subsequent public availability from data archive centres.

The EIA training pack (Indicator 0.2) is in progress (see Section 3.2) and is on track for completion and delivery before the end of the project.

Training in survey techniques (linked to Indicator 0.3) was delivered during project Year 2. Additional training is planned for Year 4. The use of the equipment provided as part of this project by multiple staff across multiple departments will increase both the capability and ability to monitor Montserrat's marine resources effectively.

The education resource pack to implement ocean literacy topics within the school curriculum (linked to Indicator 0.4) is in progress (see Section 3.2). A draft pack has been produced and discussions on the finalisation of this pack will be carried out in Year 3, once a new representative from Montserrat Secondary School has been confirmed.

It is considered that these four indicators are still adequate for measuring achievement of the intended outcome. It is considered that we are on track currently to complete all of the activities and outputs detailed within the project logical framework by the end of the project and, therefore, we consider it likely that the overall project outcome will be achieved. This presumption is, however, based on the assumption that travel and working restrictions from Covid-19 will not be extended to a point where Year 4 visits are not able to proceed as planned. It is looking increasingly likely that impacts from the Covid-19 pandemic will affect the project timetable for Year 4 and we are closely monitoring this situation and will discuss this with Darwin if additional project changes look necessary.

3.4 Monitoring of assumptions

Several assumptions have been tested this year:

"Local staff are able to participate in knowledge exchange events."; "Local staff are able to participate in researcher exchange"; "Local teachers are able to participate in consultation meetings"; as well as the additional assumption added during Year 2: *"travel and working restrictions from Covid-19 will not be extended to a point where Year 3 visits are not able to proceed as planned."*

Due to the impact of Covid-19 and the ongoing travel restrictions, some project activities, including in-country visits, have been unable to proceed this year. A change request has been submitted, and approved, to extend the duration of the project by 1 year and to move all in-country visits into this new Project Year 4. We are unsure yet when travel may be able to resume and are continuing to monitor the situation closely.

Due to the unique nature of the current Covid-19 situation, we do not believe this could have been mitigated for.

The assumptions listed in the log frame have been reviewed and these remain valid. There are also risks to the project delivery which are captured in an internal risk register document. These are under constant review and escalated when required. The risk register has not been provided with this report; however, it is available on request.

An additional assumption going forward for Year 4 of the project is that travel and working restrictions from Covid-19 will not be extended to a point where Year 4 visits are not able to proceed as planned. We anticipate, however, that this could be the case and the project completion timetable may be impacted. We will keep this under review in our Project meetings between all partners and will discuss with Darwin if this happens.

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

Provision of EIA training workshops and the EIA training pack will strengthen management tools to inform the sustainable development of Montserrat. This will allow informed decisions to be made on development projects which adequately consider and mitigate for any impacts on Montserrat's marine biodiversity.

The education resource pack will increase awareness of marine issues affecting Montserrat and Montserrat's biodiversity. This increased knowledge and awareness will help to highlight the importance of biodiversity conservation. Through targeting this resource pack at secondary school children, this impact will last for years to come and influence future generations.

Provision of the underwater camera system and training in its use will enable GoM to monitor the seabed more effectively than departments are currently able to. The system can be operated at depths which are of higher risk to divers and for longer periods which enables wider monitoring of the marine environment (See station distribution and daily progress in Half Year Report 2). Two activities which represent areas of environmental concern are the port development in Little Bay and the positioning of fish traps by the island's fishers, activities that are essential for sustainable development of Montserrat's economy. Use of the camera equipment will enable greater monitoring capability in areas of concern and provide evidence to initiate mitigation measures where necessary. This evidence-based approach to monitoring and management of the marine environment of Montserrat has been limited until now. This will contribute to biodiversity conservation through sustainable management as well as contributing to human development and wellbeing through aiding in the management of marine uses essential to Montserrat's economy and individual livelihoods.

Montserrat is developing a Sustainable Oceans Policy and associated evidence data layers to ensure the long-term health of Montserrat's waters through ocean zoning, establishing Marine Protected Areas (MPAs) and fisheries reforms. This project will produce high resolution data layers and marine habitat maps to support the development and management of MPAs. It will also assist in the use of sustainable management practices through EIA review. The creation of MPAs in Montserrat will support the United Nations target to have 30% of the world's oceans protected by 2030, and the UK Government's desire to have the rich environmental assets of the Overseas Territories protected for the future. Work towards these ultimate goals is ongoing throughout the project.

5. OPTIONAL: Consideration of gender equality issues

The Cefas and GoM teams working on this project are of mixed genders. The stakeholders engaged in the various aspects of the project are generally an even mix of men and women. For the project overall, especially within the management authorities and governmental agencies, we expect the distribution of training benefits to be equal across genders.

Active steps are taken by the Cefas team to ensure equal opportunities are available for all genders at advanced training events and workshops. It is recognised that if travel to stakeholder workshops, training events or meetings is required, equal gender attendance may be limited by parental responsibilities. Therefore, the Cefas team give consideration in the organisation of training workshops and meetings to the location, length and timing of any events to allow stakeholders who may have parental duties the ability to attend more easily.

Due to Covid-19 travel restrictions, no training workshops were able to take place during Year 3. However, after review of all workshops and training events delivered so far over the lifetime of this project, we consider that the project has managed to maintain and promote a gender balance at events and workshops. Over the three training workshops delivered so far, the attendance has been 53% female and 47% male (see Annual Report 1 and 2 for attendee lists from individual workshop events).

6. Monitoring and evaluation

The logical framework is used to assess project milestones. Progress towards the outcome is being made and the overall aims of the project are on course to be achieved by project completion.

Each work package deliverable is reviewed by the Principal Investigator and the Project Manager before distribution to project partners for comment. Minutes and notes are kept from project planning meetings held between Cefas and GoM and agreement of any actions or decisions from these meetings are circulated to project partners (minutes from these meetings provided in Annex 3).

Each work package also holds regular meetings with Kerry l'Anson, Cefas project manager, to go through a checklist of project progress and risk assessment. The systems in place enable proactive management of the project.

7. Lessons learnt

The lessons taken from Year 3 of the project were mainly related to communication between project partners. Due to the Covid-19 travel restrictions, all meetings and communication with

partners has taken place online. This was more challenging than in-person, in-country meetings for project planning as it is harder to collaborate and brainstorm as well develop and build on relationships with project partners when not able to meet face-to-face. Communication can also be restricted by time differences, availability, and issues with unreliable technology or internet connections. All partners have worked hard throughout the year to facilitate project communication and build working relationships remotely.

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

Please comment on the involvement of the Waitt Institute, since this organisation is the main project partner.

This comment was addressed in Half Year Report 3.

Please submit evidence of the data analysis for the underwater survey. The data in Annex 9 is a snapshot of the database, not evidence of the analysis.

This comment requires clarification. Analysis of the data acquired from the seabed survey is conducted in two parts. Preliminary analysis involved the enumeration of identifiable biota and substrate percentages, this is the translation of raw seabed imagery into a database (a sample / biota matrix) which can be used in assemblage analysis. As such, we consider provision of a database snapshot to be evidence of preliminary analysis.

Further to this, multivariate analysis to determine definable epibiotic assemblages and their composition (secondary analysis) has now been undertaken in Year 3, and evidence of this is presented in Annex 4.

Please revise Outcome Indicators 0.3 and 0.4 to ensure that they are SMART.

This has been discussed with Darwin and we submitted a change request during Year 3 to amend the wording of Outcome Indicators 0.3 and 0.4. This request was approved, and this is reflected in the Logical Framework wording in Annexes 1 and 2.

9. Other comments on progress not covered elsewhere

During the year we had the very sad news of the sudden and tragic passing of Mrs Patterson, the acting vice principal of Montserrat Secondary School and education lead for the GoM on this project. We are unsure of the impact this loss could have on future project activities and outputs. The consultation on finalisation of the educational resource pack has been put on hold until a new representative can be found.

10. Sustainability and legacy

As an Executive Agency of Defra, Cefas complies with UK Government requirements to make all data available for re-use. Cefas has an internal data management system which publishes data directly on its Open Access Cefas Data Hub (https://www.cefas.co.uk/cefas-data-hub). From there the data are distributed to UK Data Archive Centres (DAC) for marine data by the Marine Environmental Data and Information Network (MEDIN). Cefas itself is a DAC for fisheries data. All data supplied to DACs is often picked up by global data centres such as GBIF, thereby increasing the visibility of the data. All data from this project will be shared with the GoM, the education packs will be shared with schools, and the EIA resource packs will be handed over to MATLHE. This will allow for the data collected and the knowledge gained during the project to be maintained after the end of the project and resource packs will also allow for new MATLHE staff to have access to training materials in the future.

Working closely with local stakeholders, we will also ensure personal and professional relationships will be maintained beyond the end of the project. The outputs will provide a basis for sustainable management and the education of future generations beyond the duration of the project itself. The work undertaken over Year 3 on progressing the educational resource packs and further refining the habitat mapping layers has laid the foundation to provide lasting change once the project is completed.

11. Darwin identity

Project activities, especially those planned for in-country, have been reduced during Year 3 due to ongoing travel restrictions. There have been no external publications during this year.

However, the project team has publicised the Darwin Initiative as funders for the project at every opportunity. All presentation slides and shared documents include the Darwin logo. All paperwork and resources distributed to project partners also includes the Darwin Initiative logo.

12. Impact of COVID-19 on project delivery

The main impact Covid-19 on the project has been the ongoing travel restrictions. Some project activities, including in-country visits and stakeholder engagement and events, have been unable to proceed this year as planned. Work has been undertaken remotely where possible (for example the stakeholder engagement and feedback sessions on the draft educational resource pack were held online). A change request was submitted, and approved, to extend the project duration by 1 year and move all in-country visits planned for Year 3 of the project into Year 4. We are unsure yet when travel may be able to resume and are continuing to monitor the situation closely.

We anticipate that travel and working restrictions from Covid-19 will continue into Project Year 4. Currently, we estimate that we may be able to resume in-country visits and stakeholder engagement events from Q3 of Project Year 4. If this is the case, we should be able to complete the majority of Year 4 activities as planned, with some potentially having to move to online platforms where possible. However, if the situation changes, or we are unable to resume visits at this time, it may be necessary to consider additional adjustments to project plans. This may be to see if some activities can be undertaken remotely, or to submit an additional change request to extend the project duration further and/or move some activities later in the Year and move some funding between budget lines.

Cefas has updated its health and safety and travel plans due to Covid. Additionally, individual travel plan documents are produced for every overseas visit and these include emergency protocols, first aid plans, key contacts, etc. (an example travel plan document can be provided on request) Before any in-country visits take place, these will be fully discussed with the Principal Investigator and Project Manager and travel plans will be agreed and signed off. Any in person meetings and/or stakeholder events will be planned in full alignment with the Covid guidelines and restrictions of the relevant country, including the number of attendees, sanitisation of materials and equipment, and any social distancing or mask wearing required.

13. Safeguarding

Please tick this box if any safeguarding violations have occurred during this financial year.	☐

If you have ticked the box, please ensure these are reported to ODA.safeguarding@defra.gov.uk as indicated in the T&Cs.

Cefas has in place, and maintains, all of the following:

- a safeguarding policy, which includes a statement of our commitment to safeguarding and a zero-tolerance statement on bullying, harassment and sexual exploitation and abuse
- a detailed register of safeguarding issues raised and how they were dealt with
- clear investigation and disciplinary procedures to use when allegations and complaints are made, and have clear processes in place for when a disclosure is made
- a whistle-blowing policy which protects whistle blowers from reprisals and includes clear processes for dealing with concerns raised
- a Code of Conduct for staff and volunteers that sets out clear expectations of behaviours - inside and outside the work place - and make clear what will happen in the event of non-compliance or breach of these standards

Cefas also shares its safeguarding policy with downstream partners.

14. Project expenditure

Table 1: Project expenditure <u>during the reporting period</u> (1 April 2020 – 31 March 2021)

Project spend (indicative) in this financial year	**2020/21 D+ Grant (£)**	**2020/21 Total actual D+ Costs (£)**	**Variance %**	**Comments (please explain significant variances)**
Staff costs				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Others (consumables)				
TOTAL				

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2020-2021 – if applicable

Project summary	Measurable Indicators	Progress and Achievements April 2019 - March 2020	Actions required/planned for next period
Impact To provide the Montserrat government with the necessary skills and tools for effective management of marine biodiversity.		Some progress has been made to achieving the overall project impact. Equipment for undertaking marine surveys has been delivered to Montserrat and training has been delivered on survey techniques and use of equipment (see output 2 and section 3.2). Skills and knowledge have been built and developed in EIA review with the delivery of the EIA workshops during Year 1 and 2. Evidence from the workshop evaluation forms (See Annual Report 1 and 2) show an increase in skills and knowledge of EIA review as a result of the workshops, therefore contributing to the achievement of the project impact. Work with GoM on EIA review has also allowed for the GoM's work to progress on the assessment of the Little Bay Port Project. See also Sections 4 for more information on the contribution the project has made to biodiversity.	
Outcome Enhanced in-country capability and ability to protect biodiversity and manage the marine environment for sustainable use of its marine resources by March 2022.	0.1 A west coast database of coastal and offshore seabed environments will be published before March 2022, increasing habitat knowledge in waters exceeding 100 m compared to baseline. 0.2 Delivery of a Montserrat-specific EIA training pack and assessment	Progress has been made on achieving the project outcome (see also Section 3.3 for additional comments on progress toward project outcome). Although these measurable indicators will not be fully delivered or achieved until the end of project Year 4, many of	For measurable indicator 0.1, work will continue on finalisation of the habitat map database which will be refined in consultation with GoM prior to final delivery in Q3 of Year 4 and subsequent public availability from data archive centre.

	procedures will give Government of Montserrat (GoM) staff the skills to review EIAs and future confidence to challenge or support development. 0.3 Delivery of equipment and training will give GoM staff the skills to implement marine underwater camera surveys and maintain a monitoring programme of mapped seabed environments by the end of the project. 0.4 GoM staff has committed to the implementation of ocean literacy topics within the secondary school curriculum from September 2022.	them are partly completed as set out against outputs 1 – 3 below. Measurable indicator 0.1 has been progressed through the ground-truthing survey, and analysis of the data obtained, and production of a predictive habitat map. Measurable indicator 0.2 has been progressed through the EIA workshops and meetings where some resources have already been provided to GoM (see Annual Report 1 and 2). Work has begun on the creation of the EIA training pack which will be delivered in Year 4. Measurable indicator 0.3 has been partly delivered. Equipment and training in video survey techniques was delivered during Year 2 (see Annual Report 2). Measurable indicator 0.4 has been progressed through the development of the draft educational resource pack and discussions with relevant stakeholders (see Section 3.2). Work is now progressing on finalising this pack.	For measurable indicator 0.2, work will continue on the EIA training and resource packs and these will be delivered to GoM stakeholders by Q3 Year 4. For measurable indicator 0.3, further training courses in video survey data analysis, interpretation and mapping techniques will be delivered by Q3 Year 4. For measurable indicator 0.4, the final resource pack and training for the relevant GoM staff and stakeholders will be delivered by Q3 Year 4.
Output 1. Undertake knowledge transfer and build capacity through workshops and training with a minimum of 10 GoM staff from different departments for the duration of the project.	1.1 Three days of training workshops delivered to a minimum of two GoM staff during May 2019 on video survey techniques and analysis of ground truthing data to produce classified seabed maps. Vessel crew will also gain understanding of the required processes for survey. 1.2 Effective decision-making through three weeks of workshops	Progress has been made toward achieving this output. Measurable indicator 1.1 was partly delivered during Year 2 with training in video survey techniques. Further training in data analysis will be delivered in Year 4. A workshop will also be delivered in Year 4 on data interpretation and mapping. Measurable indicator 1.2 has been partly delivered. Bullet 1 has been completed with the two separate workshops being held in Year 1 and 2. The second and third bullet points will be delivered in project Year 4.	

	demonstrating the interpretation and review of E.I.A: • By the end of project year 2 (April 2020), at least six individuals total from the relevant departments will have received training via two separate workshops held in Montserrat and will have developed the skills and confidence to review EIAs within their own departments. • By the end of project year 4 (March 2022) two individuals total from the relevant departments will have received intense one-on-one training via two separate training sessions in Montserrat and a one week training programme in the UK as part of a researcher exchange. These individuals will have developed the skills and confidence to take the lead on reviewing EIAs within their departments and oversee future staff training. • By the end of project year 4 (March 2022) an EIA training pack and series of desk-based procedures/policies will have been produced to assist Montserrat with ongoing training and management of the EIA review process after the end of the project. The identified EIA leads in the relevant departments will have been trained in the use of these resources.		
Activity 1.1 Project kick off meeting, mid-project meeting and final project stakeholder meetings.		Part completed. The kick-off meeting was completed in Year 1, the mid-project meetings were	The final project stakeholder meetings will take place during Q3 and Q4 of Year 4.

	completed in Year 2, and the final meeting is due for completion in Year 4.	
Activity 1.2 Two day video survey techniques and analysis training course	Part completed. Training was delivered during Year 2 in video survey techniques. Due to the complexity of the seabed, the survey period focussed on data acquisition and training in video survey techniques. It was decided that training in analysis will be delivered alongside Activity 1.3 in Year 4.	Training course in video survey analysis will be delivered before Q3 Year 4.
Activity 1.3 One day data interpretation and mapping training course	Activity to be completed in Year 4. No progress made on this activity in Year 3 due to travel restrictions.	Training course in interpretation and mapping techniques is planned for Q3 Year 4.
Activity 1.4 Researcher exchange	Activity to be completed in Year 4. The researcher exchange visit was set to take place between 11 and 15 May 2020. Travel arrangements had already been made for the 3 MATLHE representatives taking part in the visit and an agenda for the week had been agreed. This visit had to be cancelled due to Covid travel restrictions and it is now planned to be rearranged during Year 4.	The researcher exchange visit is planned for Q3 Year 4.
Activity 1.5 Workshops to build capacity of staff in managing the marine environment.	Completed in Year 1 and 2.	N/A
Activity 1.6 EIA evaluation support	Activity to be completed in Year 4. Provision of EIA support has been ongoing throughout the project with the delivery of guidance documents and resources to MATLHE and EIA workshop attendees.	A final training and resources pack will be produced during project Year 4 to be handed over to MATLHE in Q3.

Output 2. Create and provide a GIS Database with environmental layers and maps of marine benthic environments in Western shelf waters by quarter three, 2022.	2.1 Completion of 14 day underwater video characterisation survey of area of interest with 60 stations successfully sampled. 2.2 All survey data made available to GoM as soon as possible following survey and analysis stages prior to public-access provision in GIS format via Cefas Datahub by quarter three, 2021. 2.3 A minimum of five data layers will be provided in the database.	Progress has been made toward achieving this output. Measurable indicator 2.1 was successfully delivered in Year 2. Measurable indicator 2.2 and 2.3 have been partially delivered. The survey data collected was analysed in Year 2 (evidence provided in section 3.2 and Annex 4). Seabed characterisation data layers were developed and shared with GoM and stakeholders in Year 3 (evidence provided in section 3.2 and Annex 5). These will be finalised and delivered during project Year 4 in line with the project timetable.	
Activity 2.1 Review multibeam echosounder data and design video characterization survey		Completed in Year 1	N/A
Activity 2.2 Undertake 14 day video characterization survey		Completed in Year 2.	N/A
Activity 2.3 Analyse and quantify physical characteristics and biological assemblages from video and photographs		Completed in Year 2 (additional evidence provided in section 3.2 and Annex 4 as requested in Darwin review of Annual Report 2).	N/A
Activity 2.4 Combine data with Waitt Institute survey to develop seabed characterisation data layers		Completed in Year 3, evidence provided in section 3.2 and Annex 5.	N/A
Activity 2.5 Share characterisation layers with local stakeholders		An initial predictive habitat map has been shared with local stakeholders (see section 3.2 and Annex 5).	The database will be refined and finalised in consultation with stakeholders in Year 4.
Activity 2.6 Publish paper in peer review journals to increase knowledge of the distribution of Montserrat marine biodiversity		Activity to be completed in Year 4.	This work will be undertaken in Q2 and Q3 of Year 4.
Activity 2.7 Make data freely available to data archive centres. Data available to UK and Local government to inform development.		Activity to be completed in Year 4.	This will be delivered by Q3 Year 4.
Output 3. Increase awareness on marine issues affecting Montserrat by creating an educational resource pack to be used within the secondary school. Work closely with the community, providing	3.1 By March 2019 consultation meetings with Montserrat secondary school, Deputy Minister of Education, parents, National Trust and Aqua Montserrat attracts a good number of interested education professionals.	Progress has been made toward achieving this output. Measurable indicators 3.1 and 3.3 were successfully delivered in Year 1. Measurable indicator 3.2 has been partially delivered. The draft resource pack was completed during Year 2. Feedback on this resource pack was obtained during Year 3 through telephone and email communication with the Secondary	

information and support to current local projects (Aqua Montserrat) and attend community events (St Patricks Day Parade) by March 2022.	3.2 By December 2019 successful delivery of first draft educational resource pack will be provided to Montserrat Secondary school. Feedback from two teaching staff, two GoM, Aqua Montserrat and parents will allow for the resource pack to progress into the final version by February 2022. 3.3 By June 2019 a joint stand with the National Trust, at St Patrick's Day Parade will be well received, increasing the community awareness on marine issues affecting Montserrat. 3.4 By June 2021 two GoM representatives and two teaching staff attend a workshop detailing the teaching resources with a view to supporting the inclusion of ocean literacy topics in the secondary school curriculum for Yr 9/10/11 Geography by March 2022. 3.5 Resource pack and training materials are well received by pupils and teachers at Montserrat Secondary school and put to use within the Geography curriculum by March 2022.	School due to travel restrictions preventing an in-person consultation meeting (see section 3.2). Remaining consultation on this resource pack has been delayed to June 2021 due to the death of a key staff member within the Montserrat Secondary School. The final version of the resource pack is due for completion in Year 4. Measurable indicators 3.4 and 3.5 will be delivered during project Year 4 in line with the project timetable.	
Activity 3.1 Premeeting		Completed in Year 1.	N/A
Activity 3.2 Preparation ahead of consultation		Completed in Year 1.	N/A
Activity 3.3 First consultation meeting in Montserrat		Completed in Year 1.	N/A
Activity 3.4 Creation of draft resource pack		Completed in Year 2.	N/A

Activity 3.5 Second consultation meeting to be held virtually	Partially completed in Year 3. Feedback on the draft resource pack was obtained during Year 3 through telephone and email communication with the Secondary School due to travel restrictions preventing an in-person consultation meeting (see section 3.2). Remaining consultation on this resource pack has been delayed to June 2021 due to the death of a key staff member within the Montserrat Secondary School.	Final consultation and sign off to happen during Year 4 once a new representative from Montserrat Secondary School has been confirmed.
Activity 3.6 Amending and finalising resource pack	Activity to be completed in Year 4.	This will be delivered by Q3 Year 4.
Activity 3.7 Third and final meeting in Montserrat	Activity to be completed in Year 4.	This will be delivered by Q3 Year 4.

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

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: To provide the Montserrat government with the necessary skills and tools for effective management of marine biodiversity.			
Outcome: Enhanced in-country capability and ability to protect biodiversity and manage the marine environment for sustainable use of its marine resources by March 2022.	0.1 A west coast database of coastal and offshore seabed environments will be published before March 2022, increasing habitat knowledge in waters exceeding 100 m compared to baseline. 0.2 Delivery of a Montserrat-specific EIA training pack and assessment procedures will give Government of Montserrat (GoM) staff the skills to review EIAs and future confidence to challenge or support development. 0.3 Delivery of equipment and training will give GoM staff the skills to implement marine underwater camera surveys and maintain a monitoring programme of mapped seabed environments by the end of the project. 0.4 GoM has committed to the implementation of ocean literacy topics within the secondary school curriculum from September 2022.	0.1 Statement from stakeholders that the seabed classification, with increased area coverage (km2) and resolution compared to baseline, is beginning to be used by GoM for targeted feature management by March 2022. 0.2. • Workshop reports detailing course content, list of attendees and attendee feedback demonstrating knowledge transfer. • Final project report detailing all engagement throughout project and assessment from GoM and Cefas staff on expected and realised increases in knowledge of EIA procedures. • Montserrat specific EIA training pack and desk-based procedures have been delivered and GoM have committed to integrating approaches into their procedures by March 2022. 0.3 Training of two staff undertaken during survey and followed by techniques and analysis workshops for	0.1 Weather allows data collection. 0.2 & 0.3 Training and knowledge exchange will give GoM staff skills and confidence needed.

		six staff by March 2022, training checklist and competency evaluation for GoM staff to be completed signed by Cefas staff. Camera equipment provided following survey in 2019 to ensure capacity for monitoring is maintained, a list of independent deployments by GoM staff will be provided in March 2022. 0.4 Statement from Secondary School staff/Minister for Education.	
Output 1 Undertake knowledge transfer and build capacity through workshops and training with a minimum of 10 GoM staff from different departments for the duration of the project.	1.1 Three days of training workshops delivered to a minimum of two GoM staff during May 2019 on video survey techniques and analysis of ground truthing data to produce classified seabed maps. Vessel crew will also gain understanding of the required processes for survey. 1.2 Effective decision-making through three weeks of workshops demonstrating the interpretation and review of E.I.A: • By the end of project year 2 (April 2020), at least six individuals total from the relevant departments will have received training via two separate workshops held in Montserrat and will have developed the skills and confidence to review EIAs within their own departments. • By the end of project year 4 (March 2022) two individuals total from the relevant departments will have received intense one-on-one training via two separate training sessions in Montserrat and a one	1.1 Training agenda and attendees list; testimonial from Royal Montserrat Police Force (vessel operator) and GoM staff present on survey by June 2019. Survey reports with GoM staff contribution. 1.2 Training agendas and attendee lists; workshop reports; training pack (provided electronically to identified EIA leads); training pack and Desk-based procedures and policies (provided electronically to relevant departments)	Local staff are able to participate in knowledge exchange events. Local staff are able to participate in researcher exchange and are able to obtain necessary seagoing and medical qualifications.

	week training programme in the UK as part of a researcher exchange. These individuals will have developed the skills and confidence to take the lead on reviewing EIAs within their departments and oversee future staff training. • By the end of project year 4 (March 2022) an EIA training pack and series of desk-based procedures/policies will have been produced to assist Montserrat with ongoing training and management of the EIA review process after the end of the project. The identified EIA leads in the relevant departments will have been trained in the use of these resources.		
Output 2 Create and provide a GIS Database with environmental layers and maps of marine benthic environments in Western shelf waters by quarter three, 2022.	2.1 Completion of 14 day underwater video characterisation survey of area of interest with 60 stations successfully sampled. 2.2 All survey data made available to GoM as soon as possible following survey and analysis stages prior to public-access provision in GIS format via Cefas Datahub by quarter three, 2022. 2.3 A minimum of five data layers will be provided in the database.	2.1 Successful delivery of survey evidenced by daily progress reports, testimonial from Royal Montserrat Police Force (vessel operator) and GoM staff present on survey by June 2019. 2.2 Acknowledgment of data receipt from GoM for data layers provided to Montserrat GIS Information Centre.	Weather conditions suitable for survey activities to be undertaken during time in country.
Output 3 Increase awareness on marine issues affecting Montserrat by creating an educational resource pack to be used within the secondary school. Work closely with the community, providing information and support to current local	3.1 By March 2019 consultation meetings with Montserrat secondary school, Deputy Minister of Education, parents, National Trust and Aqua Montserrat attracts a good number of interested education professionals.	3.1 Meeting Minutes; testimonial from teachers at Montserrat secondary, two GoM and Aqua Montserrat by May 2019. 3.2 Feedback from Secondary school, Aqua Montserrat and parents.	Local teachers are able to participate in consultation meetings.

projects (Aqua Montserrat) and attend community events (St Patricks Day Parade) by March 2022.	3.2 By December 2019 successful delivery of first draft educational resource pack will be provided to Montserrat Secondary school. Feedback from two teaching staff, two GoM, Aqua Montserrat and parents will allow for the resource pack to progress into the final version by February 2021. 3.3 By June 2019 a joint stand with the National Trust, at St Patrick's Day Parade will be well received, increasing the community awareness on marine issues affecting Montserrat. 3.4 By June 2021 two GoM representatives and two teaching staff attend a workshop detailing the teaching resources with a view to supporting the inclusion of ocean literacy topics in the secondary school curriculum for Yr9/10/11 Geography by March 2022. 3.5 Resource pack and training materials are well received by pupils and teachers at Montserrat Secondary school and put to use within the Geography curriculum by March 2022.	Successful delivery of draft educational resource pack by December 2019. 3.3 Attendees list; testimonial from community and National Trust by July 2019. 3.4 Training agendas and attendee lists; workshop report; resource pack; teachers support pack, differentiated activity resources and practical displays. Feedback and testimonials from two GoM representatives and two teaching staff by June 2021. 3.5 Successful delivery of final educational resource pack, teachers support pack, classroom displays, differentiated activity resources and practical displays by March 2022.	

Activities (each activity is numbered according to the output that it will contribute towards, for example 1.1, 1.2 and 1.3 are contributing to Output 1)

1.1 Project kick off meeting, mid-project and final stakeholder meeting

1.2 2 day video survey techniques and analysis training course

1.3 1 day data interpretation and mapping training course

1.4 Researcher exchange

1.5 Two 4-5 day workshops in Montserrat to build the capacity of staff in managing the marine environment through enhancing knowledge on the EIA evaluation process, its use in decision-making and identify relevant issues associated with marine development projects

1.6 EIA evaluation support

2.1 Review multibeam echosounder data and design video characterization survey

2.2 Undertake 14 day video characterization survey
2.3 Analyse and quantify physical characteristics and biological communities from video and photographs
2.4 Combine data with Waitt Institute survey to develop habitat characterization data layers
2.5 Share habitat layers with local stakeholders
2.6 Publish paper in peer review journals to increase knowledge of the distribution of the marine biodiversity
2.7 Make data freely available to data archive centres. Data available to UK and Local government to inform development

3.1 Premeeting
3.2 Preparation ahead of consultation
3.3 1st consultation meeting in Monserrat
3.4 Creation of draft resource pack
3.5 2nd consultation meeting to be held virtually
3.6 Amending and finalising resource pack
3.7 3rd and final meeting in Monserrat; launch and celebration of the new education pack