Darwin Plus:
Overseas Territories Environment and Climate Fund
Annual Report

Darwin Plus Project Information

Project reference	DPLUS129
Project title	Understanding Ramsar wetland dynamics for marine conservation and environmental resilience
Territory(ies)	Turks and Caicos Islands
Lead partner	Environment Systems Ltd
Project partner(s)	Department of Environment and Coastal Resources (TCI); Marine Conservation Society (UK); University of Exeter (UK); Joint Nature Conservation Committee (UK)
Darwin Plus grant value	£251,807.00
Start/end dates of project	01-07-21 — 30-06-23
Reporting period (e.g. Apr 2021-Mar 2022) and number (e.g. Annual Report 1, 2)	JUL 2021 — MAR 2022 Annual Report 1
Project Leader name	Katie Medcalf
Project website/blog/social media	https://www.envsys.co.uk/ramsar-wetlands/
Report author(s) and date	S. Pike; K. Medcalf; B. Manco

1. Project summary

The project will provide evidence of the dynamic resilience of the Turks and Caicos Islands' wetlands, and how they support biodiversity, coastal protection, and natural capital.
It will evaluate historic change, show how future climate could impact the wetlands, and provide evidence to review, and expand the Ramsar extent. It will develop a monitoring framework and dashboard to view project and ongoing monitoring data, build technical and scientific capacity in local staff, in order to help sustain wetland management in the long term.

2. Project stakeholders/partners

The project partners met virtually at the commencement of the project (EVIDENCE), composed of Environment Systems Ltd (lead), Department of Environment & Coastal Resources (DECR), Marine Conservation Society (MCS), and Joint Nature Conservation Committee (JNCC). Due to conflict in availability, University of Exeter (UoE) could not join the initial meeting, but was caught-up. There have been monthly calls with DECR to discuss all aspects of the project, with the first half of the year focussing on enabling fieldwork (with MCS) and changes in management on-island departments, and the second half focussing on recruitment of the wetland ecologist as well as data modelling. On-island technical advice, planning, and action from SWA Environmental (SWA) was vital for the turtle habitat ground truthing.

All project partners have been involved in the planning, decision making, and execution of activities related to their role.

Local stakeholder engagements and consultations will commence in year two, when the recruited ecologist is in post on-island.

3. Project progress

3.1 Progress in carrying out project Activities

Output 1. Documentation, maps and methods: a) evidence of the functions of the wetland; b) measures of good ecological condition established by the project; and c) reporting methods that take into account the changing climate.

Activities for Output 1 for this first year of the project include collating existing environmental data, acquiring archive and up-to-date satellite imagery to better understand the current wetland dynamics, as well as any changes that have occurred since 2000. There is also a component of ecological and climate modelling, to start understanding the impacts that future conditions might have on the wetlands.

The original creators of the Darwin Project 8146 habitat data were contacted, and able to source some information from their archive. This data was enough to work on, and a new analysis-ready format was produced (EVIDENCE 1). Alongside this, habitat maps created in 2010 and 2020 were sourced, with crosswalks created to establish habitat changes within and across the last twenty years.

Landsat satellite data since 2000 has been sourced and processed, together with Sentinel-1 and Sentinel-2 since 2018. These have been used to create indices of monthly, seasonal and annual ground inundation, to better understand the dynamics of the wetland habitats (EVIDENCE 2, 3 ,4, 5). I.e., which areas are more frequently inundated, for how long, and how variable.

Climate data from WorldClim has been sourced and processed for selected variables, including Annual Mean Temperature, Annual Precipitation and Precipitation of Driest Month. These have been modelled historically (1970-2000, where possible) and for the year-ranges of 2041-2060 and 2061-2080, under medium- and worst-case scenarios (EVIDENCE 6, 7, 8, 9, 10).

Desk-based studies have been underway to identify the habitats and species that best represent the wetland environment, and that are most vulnerable to climatic changes.

Five days of field studies were undertaken at East Caicos to assess the nesting activities of Critically Endangered (CR) Hawksbill *Eretmochelys imbricata* and Endangered (EN) Green *Chelonia mydas* sea turtles. Additionally, data were collected to determine the classification, characteristics, and conservation values of coastal communities. The data was collected by TCI-based SWA Environmental (EVIDENCE 11).

Output 2. A monitoring intelligence dashboard enables users to view the latest in-situ and remotely sensed data in intuitive and interactive visualisations, on a single screen.

Activities for Output 2 for this first year of the project include the design of a monitoring plan, and the establishment of ground control points which would be routinely monitored on the ground by the wetland ecologist. These would then train and validate remote sensing data on habitat conditions.

The monitoring plan has not yet been finalised, as we are waiting for the wetland ecologist to come into post. They are due to start work on-island in Q1 Y2, when this activity will resume.

Output 3. Participants in the project develop the knowledge and skills necessary to effectively use the project tools required.

Activities for Output 3 for this first year of the project include the design of uploading of a project website, a project kick-off, the recruitment of a wetland ecologist, online training surgeries, and an on-island workshop. The majority of the activities for Output 3 have been delayed by several months. This is due to the unexpected amount of time it took to receive the grant award letter as well as finalise the contracts between all the project partners, which was completed in Q4. On top of this, the DECR had an unanticipated departmental split shortly before the project started, which a) required time to adjust, b) split physical assets across two departments which

were required for fieldwork, and c) reduced the availability of key partners for this project, as Departmental resourcing personnel was drastically reduced.

The project website was designed and uploaded, to include information on the project background, its partners and the key stages (EVIDENCE 12).

The process of recruiting the wetland ecologist was initiated shortly after the award was finalised. The specification was created in collaboration with DECR, within Q2, and advertised on websites and across social media (EVIDENCE 13). The application deadline had to be extended to the end of Q3 as only one candidate initially applied. Four candidates were interviewed in Q4, and the process of relocation initiated. The new ecologist is due to arrive, and start work in Q1 Y2.

Planning has started for the project public engagements, the online GIS and the fieldwork training sessions. These have not yet been finalised as we are waiting on the wetland ecologist to commence work. They are due to start work on-island in Q1 Y2, when these activities will resume.

3.2 Progress towards project Outputs

Output 1. Documentation, maps and methods: a) evidence of the functions of the wetland; b) measures of good ecological condition established by the project; and c) reporting methods that take into account the changing climate.

The long-term and short-term wetland dynamics and habitat changes that have occurred since 2000 have been modelled, to be verified by experts at JNCC in Q1 Y2. Desk-based studies of what constitutes good ecological condition has begun. These have not yet been finalised as we are waiting on the wetland ecologist to commence work. He is due to start work on-island in Q1 Yr 2, when these activities will resume. In preparation for this, the required climate data and models have been processed, to add to the risk and opportunity forecasts.

The production of maps detailing historic habitat change, current wetland dynamics, current and future risks to the wetlands, and the opportunities to mitigate against those risks, will provide evidence that the Output has been completed.

Output 2. A monitoring intelligence dashboard enables users to view the latest in-situ and remotely sensed data in intuitive and interactive visualisations, on a single screen.

An internal assessment of the ground collection routines has been drawn up. These cannot be finalised without the wetland ecologist, who is due to commence work in Q1 Y2. However, satellite data from Sentinel-1 and Sentinel-2 are being continuingly acquired and processed, ready to be modelled into the specific indicators required, using the training data from the intended field surveys.

Output 3. Participants in the project develop the knowledge and skills necessary to effectively use the project tools required.

The project webpage has been set-up. The wetland ecologist post has been advertised, interviewed, recruited, and due to commence work in Q1 Yr2. From this time, the online training sessions can begin, and the first on-island workshop can commence, which will include public and local stakeholder engagement.

3.3 Progress towards the project Outcome

The project outcome is for **TCI to create and maintain scientifically robust evidence to support, and potentially extend the Ramsar site, through understanding and monitoring of key wetland natural functions to support future TCI resilience**.

It is still relatively early in the implementation of the project, and significant gains have been made in achieving the outcome by better understanding the dynamics of the wetland areas, across decadal time-scales as well as inter-year, through the modelling of satellite imagery. These will be used to infer the specific habitat ecological envelopes in Y2, form the basis of the

monitoring scheme, and help identify areas currently outside the Ramsar site that require protection now, and in the future due to climate change.

3.4 Monitoring of assumptions

Assumption	Validity	Notes
Increased monitoring, knowledge and understanding leads to action to further protect the site.	Not an issue in Y1	
Decision makers are on board and there are no other major barriers to action.	Not an issue in Y1	
Partner Covid-19 mitigating strategies remain robust and operating.	Remains active	
Current levels of knowledge can be baselined.	Not an issue in Y1	
No major natural disasters.	Not an issue in Y1	
Activities can take place remotely via video conference, at least in the early stages of the project.	Remains active	
Staff turn-over remains low - trained staff remain in post.	Remains active	
Staff have time to put learning into practice and integrate it into their day-to-day tasks.	Not an issue in Y1	
Key staff are trained and there is a plan to continue integrating the data and new techniques into working routines.	Not an issue in Y1	
The hardware/software required remains in place and operational.	Remains active	Hardware purchased and shipped for the new wetland ecologist. To be completed in Q1 Y2.
Key data (UKHO hydrographic data - species data) is available for use.	Remains active	DECR are in communication with relevant parties
UKCP18 global data gives an accurate enough data set for the modelling to be locally applicable.	**Activated**	UKCP18 was deemed too low-resolution for this study. We have sourced and processed WorldClim data instead.
Project trained staff are available post project to undertake ongoing monitoring.	Not an issue in Y1	
Budget is available post-project to undertake the monitoring.	Not an issue in Y1	
Sentinel satellites remain operational for their expected lifetime.	**Activated**	Copernicus Sentinel-1B has been unavailable since 23 December 2021. Sentinel-1A is still operational and the data being processed for this project.

		Sentinel-1C is scheduled for launch in 2023.
Staff on TCI, in the context of Covid, are able to collect field data.	Not an issue in Y1	
Field based staff in partner organisations are able to assist at key times.	Remains active	
Travel costs remain stable throughout the project to allow off-site trainers to deliver on-site training.	Remains active	
Key users of biodiversity data on island are able to join the workshops and agree to the mapping scheme.	Not an issue in Y1	
Staff time made available to participate in training.	Not an issue in Y1	
Training is provided at an appropriate level for participants.	Not an issue in Y1	
The right staff have been invited and are able to attend the workshops.	Not an issue in Y1	

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

This project focuses on the important multiple values of, and potential changes to, the Ramsar site, including considering the impact of climate change issues affecting TCI. It focuses on the following priorities:

- Conservation, restoration, and wise use of wetlands.
- Conservation and effective management of coral reef, seagrass-meadows and mangrove forest ecosystems.
- Raising awareness of these wetlands' role in coastal protection

The project will directly contribute to the Ramsar Convention by seeking to provide robust scientific evidence for the management of the TCI site and establishing the evidence-base for potentially extending the Ramsar site into East Caicos.
It will help address commitments made by UK Government in various Ramsar Resolutions, including:

- XI.14 Climate change and wetlands: implications for the Ramsar Convention on Wetland,
- XIII.16 Sustainable urbanisation, climate change and wetlands, as well as TCI's obligations to
- XIII.24 The enhanced conservation of coastal marine turtle habitats and the designation of key areas as Ramsar Sites.

It will help TCI further meet commitments set out in the three pillars of the Convention:

- work towards the wise use of all their wetlands;
- designate suitable wetlands for the list of Wetlands of International Importance (the "Ramsar List") and ensure their effective management;
- cooperate internationally on transboundary wetlands, shared wetland systems and shared species.

In terms of local initiatives, the project will help TCI further the objectives of its Environment Strategy and contribute to meeting the Convention's mission "the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world".
This project will help the Turks and Caicos Islands Government meet Guiding Principles and Commitments of the 2001 TCI Environment Charter including:

- Using natural resources wisely,
- contributing towards the protection and improvement of the global environment;
- safeguarding and restoring native species, habitats and landscape features, and
- studying and celebrating the environmental heritage as a treasure to share with our children.

The project has made good progress in supporting the project partners in acquiring large volumes of satellite imagery and climate data, as well as using data-driven models, to better understand the long-term and changes, and current dynamics of the wetland habitats. It has also provided on-site evidence of the nesting activities of Endangered, and Critically Endangered, sea turtles. The recruitment of the on-island wetland ecologist will increase the capacity of DECR to implement field surveys within the Ramsar site, and collect further on-site data to incorporate into the models, and establish a monitoring system.
As such, Y1 has focused on the data and personnel resources that underpin the ecological modelling and stakeholder engagement, which will drive the monitoring systems to be built in Y2.

5. Consideration of gender equality issues

The team working on the project are of mixed gender, with 4 members of the core staff (including the project leader) being female, and 7 being male.

The wetland ecologist candidates brought in for the interview were mixed gender, as was the interviewing panel.

Where the project will engage with more stakeholders and other members of society, in Y2, this will continue to be irrespective of age, gender, social or cultural background.

6. Monitoring and evaluation

The M&E system remains unchanged and will outline the key evaluation questions and the approach to monitoring that will help to design evaluations and data collection activities. This will allow us to identify the information we need to collect, how we can collect it, and who will collect it. The data collection methods will include:

- Analysis of project management and monitoring data
- Surveys of stakeholders and project participants
- In-depth stakeholder and participant interviews
- Analysis of open access / published data

There are 3 phases to the M&E plan:

- Evaluation design
- Mid-term evaluation report
- Final evaluation report & legacy workshop

These phases remain unchanged. However, the initial Theory of Change workshop for the project partners has been pushed back due to the unexpected delays in contract and wetland ecologist recruitment. This workshop is due to take place in Q1 Y2.

7. Lessons learnt

It took much longer than anticipated to start the project in full swing due to the delay in the award notice, and the several months it took for the partner contracts to be finalised. As such, the majority of the work was held-back until Q4 in Y1. However, during this time, the turtle nesting surveys were conducted, initial wetland dynamic data was modelled, and the recruitment for the wetland ecologist post began. It is recommended that, when projects involve multiple partners, organisations, contractors and consultants, enough of a lead-time is provided in the timetable to account for any delays.

Most of the project activities relied on the input and attendance of the new wetland ecologist. The recruitment of this post had to be extended and then re-advertised due to a lack of responses, with the post filled in late Q4 Y1. As the ecologist is needing to relocate to TCI, further delays are expected, with work intending to start mid-Q1 Y2. Similar to the contract, it is

recommended that enough lead-time is provided in the timetable for the recruitment of highly-specialised personnel, especially if relocation is high probability.

This project is heavily reliant on DECR staff on the island. Unfortunately, due to the unexpected departmental split, alongside the delayed recruitment, the increasing workload pressures on the remaining staff have decreased their availability. This could not have been anticipated, and meant that meetings and work schedules had to be more flexible.

The turtle nesting survey work was excellent. This was despite difficulties in asset and personnel resources, as well as unanticipated time pressures, that meant it had to be organised and completed much sooner than anticipated. This can be treacherous and dangerous work, especially diss/embarking from boat vessels in the very remote areas of the island.

The digitisation of the original Darwin Initiative Project 8164 TCI habitat map from 2000 was an unexpected success, especially as there is always concern about funding support leading to loss of data and monitoring opportunities. The original creators were tracked down, and worried if the original data survived transitions from multiple backup formats. Unfortunately, the zipped folders were corrupted, but high-resolution maps were available. These were manually digitised and attributed with the habitats they represented, thus bringing new life to a once-thought-lost dataset.

Future plans involve a quarterly review meeting with an internal steering group. The wetland ecologist will also join the monthly DECR meetings, and will be the main point of contact between the project lead and DECR.

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

N/A

9. Other comments on progress not covered elsewhere

The turtle survey work had to commence before the wetland ecologist could be recruited due to availability of the fieldwork expert. A tremendous effort from SWA Environmental was put in to ensure the work was done on time, and that relevant training material was available for the wetland ecologist recruitment post to use.
As a date has been set for the new wetland ecologist to commence work, a Change Request Form will be supplied, taking into account the anticipated timetable revisions.

10. Sustainability and legacy

This project has recruited a new member of staff for DECR, primarily to collect data in the field for the monitoring work, but whose role will also include being trained to train others in wetland ecology and fieldwork data methods. This will ensure that the knowledge gained from the project is transferred to those best suited to use it. This will start to build capacity for the long term.
The processed Sentinel-1 and -2 data is open licensed, and the derived data and models will be published under Creative Commons, to be freely shareable and distributed.
The exit strategies in place are still valid, and include:
ensuring all project outputs are available on-line, and under an open licence for others to use and build upon
submitting proposals for funding to various grant aid bodies in order to maintain the ecologist post, to ensure that this staff member, who will be fully trained in the project, could be available to feed any field work data into the monitoring in the future.
delivering a sustainable monitoring plan, together with an ongoing source of very low-cost data from satellites, that can be blended with local field work.

During the workshops, project partners will host a workshop session for stakeholders to share evaluation findings and, co-produce a sustained legacy plan, tailored specifically for the island.

11. Darwin identity

The project website and the wetland ecologist recruitment information have served well to publicise the project and the Darwin Initiative. DPLUS129 has also been discussed throughout other Darwin engagements and workshops, in an effort to increase awareness, but also share learnings and gain collaborations.
In Y2, once the models and outputs from each activity have been verified by external experts, they will form part of a publicity drive in Company newsletters, social media, and on-island.

12. Impact of COVID-19 on project delivery

Internal permissions for international travel for the lead project team were lifted in Q4 Y1. This also added to the decision to delay the first on-island workshop to Y2. Internal discussions were held on hosting the workshop virtually, but previous experience has demonstrated the severe limitations of this medium: it is more tiring, less engaging, less discursive, with more distractions available to delegates, facilitators cannot pick-up on non-verbal cues, and with higher chances of screen fatigue. There are also a lot of conversations and networking that occur outside of official workshops, such as during the social events and field trips, that can greatly benefit projects through wider stakeholder engagement, and cross-project collaborations.
With the arrival of the wetland ecologist due in Q1 Y2, the work plan schedule will be adjusted.

13. Safeguarding

No safeguarding issues were reported during Y1

14. Project expenditure

Table 1: Project expenditure <u>during the reporting period</u> (1 April 2021 – 31 March 2022)

Project spend (indicative) in this financial year	**2021/22 D+ Grant (£)**	**2021/22 Total actual D+ Costs (£)**	**Variance %**	**Comments (please explain significant variances)**
Staff costs	[redacted]	[redacted]	[redacted]	Delayed project start partner contracts. Delays in employing on-island wetland ecologist
Consultancy costs	[redacted]	[redacted]	[redacted]	
Overhead Costs	[redacted]	[redacted]	[redacted]	
Travel and subsistence	[redacted]	[redacted]	[redacted]	Workshop deferred until Y2
Operating Costs	[redacted]	[redacted]	[redacted]	Reduced amount of on-island fieldwork due to delayed employment of wetland ecologist.
Capital items	[redacted]	[redacted]	[redacted]	
Others (Please specify)	[redacted]	[redacted]	[redacted]	
TOTAL	[redacted]	[redacted]		

On 21 December 2021, a Change Request Form was sent to the Darwin Initiative requesting a reduction of the Y1 budget to [redacted]. This was agreed with Defra on 31st January 2022, and the original Y2 budget was increased by [redacted] This variation will ensure the project continues to meet the same outputs and outcomes.

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the **correct template** (checking fund, type of report (i.e. Annual or Final), and year) and **deleted the blue guidance text** before submission?	X
Is the report less than 10MB? If so, please email to Darwin-Projects@ltsi.co.uk putting the project number in the Subject line.	X
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.	N/A
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	X
Do you have hard copies of material you need 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.	N/A
Have you involved your partners in preparation of the report and named the main contributors	X (DECR)
Have you completed the Project Expenditure table fully?	X
Do not include claim forms or other communications with this report.	