

DPLR1\1036

Dealing with plastic waste on Diego Garcia's turtle nesting beaches

The beaches of Diego Garcia (DG), BIOT are globally important for turtle nesting with 14-20% of the Endangered green turtle (*Chelonia mydas*) and 39-51% of the Critically Endangered hawksbill turtle (*Eretmochelys imbricata*) populations of the Western Indian Ocean nesting here annually (Mortimer et al. 2020). The beaches where they nest most frequently are heavily polluted by plastic waste and additional quantities wash ashore with each high tide. Previous Darwin funded research has shown the potential impacts of plastic waste on both nest-digging females, and on nest conditions caused by microplastics in the sand column (DPLUS090). These findings led to the development of detailed beach clean guidelines and maps showing areas of highest overlap between plastic and turtle nesting and focusing beach clean efforts on times and place with the biggest impact for turtle conservation.

Efforts are made by volunteers on DG to remove plastic waste from these beaches, but their efforts are hampered in part by the lack of a suitable management strategy for this waste stream. Beach waste is aggregated at the waste site and ultimately burnt without energy recovery. In addition to the plastic waste imported and used within DG (predominantly for single-use plastic), there is an estimated 25 US tons of mixed plastic to dispose of annually and this total could be much higher via additional beach cleans.

Recently, a completed Darwin Plus project (DPLUS090) included a series of case studies outlining potential technical solutions to the issue of legacy plastic waste on DG's beaches. Following this work, and using the extensive experience of the team to assess the range of suitable solutions currently available, this proposed project seeks to develop a full feasibility study for the installation and operation of one of these case studies – the Protomax board press. The manufactured pressed plastic panels could be used locally for several purposes such as maintenance, sign boards, hoardings and for shelter building and can substitute for ply board panels in any context with the added advantage of being fully weatherproof. The full range of potential applications will be explored as part of the project report. The main output will be to detail the logistics and costs of implementing this specific technology focussed on waste management via a pilot study in situ.

The project team would scope the site, installation, training and management of one Protomax board press in DG during a site visit in September 2023. A feasibility report produced at the end of the project would include information on the complete costs of a pilot project to install, run and assess the performance of the board press over a 1-year period. It would also include the costs of removal of the unit back to the UK at the end of the pilot if required. Additionally, this review would include further information on the utility, training and maintenance requirements of its operations and any environmental impacts.

In summary, if successful this project will produce a detailed, costed plan to run a 1 year pilot project to provide waste management alternatives on Diego Garcia.

CONTACT DETAILS

Name Rachel

Surname Jones

Organisation Zoological Society of London

Website (Work) [REDACTED]

Tel (Fax) [REDACTED]

Email (Work) [REDACTED]

Address [REDACTED]

[REDACTED]

DPLR1\1036

Dealing with plastic waste on Diego Garcia's turtle nesting beaches

Section 1 - Project Title & Contact Details

Q1. Project Title

Dealing with plastic waste on Diego Garcia's turtle nesting beaches

Q2. Please select whether you are applying as an organisation or as an individual (Guidance section 3 and Guidance Glossary)

Organisation

CONTACT DETAILS

Name	Rachel
Surname	Jones
Organisation	Zoological Society of London
Website (Work)	[REDACTED]
Tel (Fax)	[REDACTED]
Email (Work)	[REDACTED]
Address	[REDACTED]

GMS ORGANISATION

Type	Organisation
Name	Zoological Society of London
Phone (Work)	[REDACTED]
Email (Work)	[REDACTED]
Website (Work)	[REDACTED]
Address	[REDACTED]

Section 2 - Overseas Territory(ies)

Q3. Overseas Territory (Guidance section 1.3):

Which UK Overseas Territory(ies) will your project be working in? Please note that in case of a non-permanent resident population you need to demonstrate a clear, meaningful, long-term link to the territory.

British Indian Ocean Territory (BIOT)

* if you have indicated a territory group with an asterisk, please give detail on which territories you are working on here:

No Response

In addition to the UKOT(s) you have indicated, will your project directly benefit any other UK OT(s) or country(ies)?

Yes

Please list these below and describe how they will benefit:

Plastic waste affects the beaches of all coastal and island communities in the OTs and beyond. It impacts wildlife and the amenity value of beaches to local communities and to tourists. These waste streams are not generated by local communities but they require resources from those communities to collect and dispose of them. Solutions that can process legacy beach plastic locally into useful products have applicability across OTs and other small, remote island communities, and this work has the potential to scale into strategically important solutions for plastic pollution.

Section 3 - Project Partners

Q4. Project partners (Guidance section 3.2)

In this section, please give details of all the partners involved (including the Lead Partner) and provide a summary of their roles.

Project Leader name (Guidance section 3.1): Rachel Jones

Lead Partner name (if applying as an organisation; Guidance section 3.1): Zoological Society of London

Lead Partner Website (if applicable): www.zsl.org

Is the Lead Partner based in a UKOT where the project is working (Guidance section 3.1)? No

Please explain why this project is led from outside the UKOT:

There is no resident population in BIOT. The applicant organisation has more than a decade of experience working in BIOT on a range of projects and a long term commitment to biodiversity conservation there.

The project team will spend some time on site in Diego Garcia but visiting research teams seek to limit their time in the territory to the minimum required to meet their objectives, mindful that DG is a working Naval Support Facility

List other partners involved and where are they based (Guidance section 3.2):

Rachel Jones (ZSL) - UK
Heather Koldewey (ZSL) - UK
Nicholas Stillwell (Protomax) - UK
Imogen Napper (Plymouth University) - UK
George Balcombe (BIOT administration) - UK/BIOT

Summary of roles and responsibilities of each partner in the project:

Rachel Jones (ZSL) - project lead, has had more than 15 years experience of working in BIOT, recent experience with research into plastic waste in the territory and active contacts in DG and with the BIOT administration in London.

Prof. Heather Koldewey (ZSL) has an established track record in identifying and scaling up solutions that address plastic pollution from communities to international policy.

Imogen Napper - plastics consultant, Research Fellow Plymouth University. PhD focussing on the sources and fate of plastic pollution in the marine environment. First author for over 10 plastic focussed publications. Research influenced the banning of microbeads in facial scrubs worldwide.

Nicholas Stillwell - CEO Protomax, inventor of board press technology, technical advisor.

George Balcombe - Strategic Environment Officer, BIOT administration.


We also anticipate bringing one additional technical expert to join a scoping trip to BIOT and have several options available through existing collaborations.


I confirm that all listed partners are aware of this application and have indicated support:


Checked

Attach a Cover Letter for your application (Guidance section 4.2).

 [Cover letter BIOT plastics project 13022023](#)

 14/02/2023

 15:42:16

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Section 4 - Project Summary & Description

Q5. Project Summary (Guidance section 3.8)

Please provide a brief summary of your project. This may be used in communication activities and/or published online, if your application is successful.

This project will produce a feasibility study for the implementation of a plastic recycling solution for Diego Garcia. It will assess the costs, logistics, environmental impacts and benefits of a trial for technology that can convert beach waste into a versatile and useful board product locally. An increased frequency of beach cleans will feed plastic into this proposed waste management solution helping to mitigate the effects of plastic on turtle nesting beaches aiding conservation benefits for these endangered species.

Q6. Description (Guidance section 2.1)

Please provide a description of your project, including:

- the overall objective
- the current situation and the problem the project is trying to address
- what success will look like and how you will measure it

Please be as specific as possible when describing the project, using quantified data and evidence where available. You may wish to consider: what are the specific threats to the environment that the project will attempt to address, and what should we know about these threats? What does your successful project look like? And how will you demonstrate whether and how your project has been successful?

The beaches of Diego Garcia (DG), BIOT are globally important for turtle nesting with 14-20% of the Endangered green turtle (*Chelonia mydas*) and 39-51% of the Critically Endangered hawksbill turtle (*Eretmochelys imbricata*) populations of the Western Indian Ocean nesting here annually (Mortimer et al. 2020). The beaches where they nest most frequently are heavily polluted by plastic waste and additional quantities wash ashore with each high tide. Previous Darwin funded research has shown the potential impacts of plastic waste on both nest-digging females, and on nest conditions caused by microplastics in the sand column (DPLUS090). These findings led to the development of detailed beach clean guidelines and maps showing areas of highest overlap between plastic and turtle nesting and focusing beach clean efforts on times and place with the biggest impact for turtle conservation.





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The project team would scope the site, installation, training and management of one Protomax board press in DG during a site visit in September 2023. A feasibility report produced at the end of the project would include information on the complete costs of a pilot project to install, run and assess the performance of the board press over a 1-year period. It would also include the costs of removal of the unit back to the UK at the end of the pilot if required. Additionally, this review would include further information on the utility, training and maintenance requirements of its operations and any environmental impacts.

In summary, if successful this project will produce a detailed, costed plan to run a 1 year pilot project to provide waste management alternatives on Diego Garcia.

(Optional) Please upload any additional and supporting materials or files (such as maps of project sites, etc) below. Maximum of 5 pages:

-  [Supporting information for Darwin local application BIOT plastics project](#)
-  13/02/2023
-  12:55:07
-  pdf 513.86 KB

Section 5 - Project Outcome(s)

Q7. Project Outcome(s) (Guidance section 1.2)

Successful Darwin Plus Local projects must demonstrate measurable outcomes in at least one of the themes of Darwin Plus, either by the end of the project or soon after through a credible plan.

Please tick which theme(s) of Darwin Plus your project underpins:

- | | |
|-----------|---|
| Checked | Biodiversity: improving and conserving biodiversity, and slowing or reversing biodiversity loss and degradation; |
| Unchecked | Climate change: responding to, mitigating and adapting to climate change and its effects on the natural environment and local communities; |
| Checked | Environmental quality: improving the condition and protection of the natural environment |
| Unchecked | Capability and capacity building: enhancing the capacity within OTs, including through community engagement and awareness, to support the environment in the short- and long-term. |

Please justify your selection.

The project will improve environmental quality by creating a viable alternative to the incineration of plastic waste, which is the main waste management option within DG.

Subsequently, the project will also contribute to the conservation of biodiversity by improving the

environmental quality of globally important turtle nesting sites by mitigating plastic accumulation on DG beaches.





Section 6 - Project Timeline

Q8. Project timeline (Guidance section 2.2)

Please provide anticipated dates for the start and end of your planned project here. Please use the Darwin Plus Local Project Implementation Timetable Template (which can be downloaded below) to provide a list of the individual activities you have planned for this project, a brief description of what each activity entails, and the months in which the activities will be carried out. If the project involves only one activity (e.g. a purchase), please still provide project start and end dates (noting estimated times for procurement). Please note that your project will need to be completed by 31 March 2024.

Start date:	End date:	Duration (e.g. 3 months):
01 April 2023	31 March 2024	12 months

Please upload the completed Darwin Plus Local Project Implementation Timetable template with your proposed project activities below.

-  [R1-DPlus-Local-Implementation-Timetable-Template-PlasticsBIOT2023](#)
-  13/02/2023
-  12:58:34
-  docx 70.07 KB

Section 7 - Costs

Q9. Costs (Guidance section 2.2 and please read the Finance Guidance)

Please provide a breakdown of costs to be funded through Darwin Plus Local (in GBP).

Are you seeking any matched funding for this project? (Please note that this is optional and there is no requirement to seek matched funding for Darwin Plus Local projects).

Yes

How much matched funding are you seeking and where from?

All travel, expenses and salary listed below is covered by the Marine Science Programme funded by the Bertarelli Foundation:

- Travel and expenses - [REDACTED]
- Rachel Jones - 10% salary - [REDACTED]
- Heather Koldewey - 5% salary - [REDACTED]
- Total - [REDACTED]

Budget line	Explanation	Cost in GBP
Staff costs:	Met by matched funding see above	████
Overhead costs:	15%	██████
Travel & subsistence costs:	Team travel to Diego Garcia	██████
Operating costs:	N/A	████
Capital equipment:	N/A	████
Consultancy costs:	Imogen Napper, consultant plastics researcher: time for 7 days on DG to complete research for feasibility study and 2.5 days/week over project timeline of 11 months to complete analysis and report writing	██████
Total:		██████

This section provides more information on the budget to help evaluators understand how you will use the funds you are requesting. You do not need to list all costs, but please list and detail costs of more than £1,000 per item below, under the appropriate budget line.

Details of staff costs over £1,000 (if relevant)

No Response

Details of overhead costs over £1,000 (if relevant):

Overhead costs are at a standard 15% rate and cover all support functions provided by ZSL including legal, insurance and financial as well as providing office and meeting space for the project team.

Details of travel and subsistence costs over £1,000 (if relevant):

No Response

Details of operating costs over £1,000 (if relevant):

No Response

Details of capital equipment costs over £1,000 (if relevant):

No Response

Details of consultancy costs over £1,000 (if relevant):

Imogen Napper - plastics consultant. Contract to gather research including all costs and logistics and to write and deliver a full feasibility study for the implementation of a one-year pilot for the Protomax board press on Diego Garcia. Task will include definition of metrics and quantification of feasibility under M&E activities.

Details of other costs over £1,000 (if relevant)

No Response

If your project budget was prepared in another currency and converted to GBP, please provide the exchange rate, its source, and the date it was accessed:

Other currency:	Exchange rate:	Source of this exchange rate:	Date exchange rate accessed:
<i>No Response</i>	<i>No Response</i>	<i>No Response</i>	<i>No Response</i>

Darwin Plus Local has been created to build capacity and contribute to local economies in-territory.

What % of the total will be spent in the OTs?

If less than 80% of the total project spend is to be spent within the OT(s), please explain why.

There is no resident population based in BIOT, just visiting military and contractors. In order to deliver any activities in the territory teams based elsewhere must be employed. In order to work cooperatively with the naval support facility on Diego Garcia research teams seek to minimise the time spent in the territory to the minimum required to achieve their objectives.

Section 8 - Local and National Priorities

Q10. Local and national priorities

Please explain how this project aligns with local and national priorities? You may wish to consider the project in the context of national environmental laws, objectives, strategies, territory specific agreements, action plans or policies.

Since 1968/70, green turtles and hawksbills have been protected by specific species conservation legislation in BIOT. In 1988, turtle protection was reinforced by several Strict Nature Reserves on Diego Garcia that require visitors to have entry permits.

Hawksbill and green turtles are listed under Appendix 1 of CITES that commits signatory states to conserving and restoring the habitats of listed species. The UK is signatory state to the Bonn Convention on Migratory Species (1979) which commits parties to conserving and restoring the habitats of listed species.

The Biodiversity Action Plan produced for these two species in BIOT highlights the impacts of plastic pollution and lays out several objectives to reduce negative impacts through beach cleans and public education efforts.





The BIOT 2017-2023 Interim Conservation Management Plan aims 'to actively manage all plastics derived from beach cleans on Diego Garcia' by 'a cost benefit analysis of all recycling possibilities, preparing plastics for collection, shipping costs, viability of recycling on Island including costs of purchasing recycling equipment', as well as seeking funding to enable effective plastic management.

This project will provide a costed plan to meet this objective and will identify suitable sources of future funding to support it.

Will the project take place on Government owned land or water?

Yes

Please attach evidence that you have Government support i.e. Letter of Support.

 [BIOTA Letter of Support - Darwin Local Plastic
s Study](#)
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Section 9 - Project Risks

Q11. Project Risks

Please demonstrate your consideration of any risks involved in this project and how you intend to manage them. Depending on your project, you may wish to consider:

- Biosecurity risks – particularly for projects involving external equipment.
- Safeguarding risks – particularly for projects involving vulnerable groups such as children, older people or people with disabilities.

Risk	Mitigation
Access to DG becomes less reliable due to political or security issues.	Regular communications with the BIOT administration to anticipate any changes to access. Travel dates for team are fully flexible and can happen at any point in the first six months of the project. Team travelling will all be made aware of the potential for delay inherent in any travel to BIOT. The team have worked successfully in DG during previous periods of political/military uncertainty and do not anticipate that there is a high risk of loss of access to Diego Garcia in the period of this proposal.
Bio-security - introduction of invasive non-native species	Team will follow all bio-security protocols issued by the BIOT administration as part of their permit application process and take full responsibility for precautionary activities such as cleaning field gear.
<i>No Response</i>	<i>No Response</i>

Do you require more fields?

No

Section 10 - Terms & Conditions

Q12. Terms and conditions (Guidance section 3.10)

By applying for Darwin Plus Local you are adhering in full to the grant Terms and Conditions in full (available at: <https://dplus.darwininitiative.org.uk/apply> and as referenced in the Guidance at section 3.10). For information, the Terms and Conditions include requirements for all applicants to (amongst other requirements as per the full Terms and Conditions):

- Uphold a zero tolerance for inaction approach to tackling sexual exploitation, abuse, and harassment.
- Where appropriate, make all reasonable and adequate efforts to address gender inequality and other power imbalances.
- Notify all cases of fraud and theft (whether proven or suspected) relating to the project to the Grant Administrator as soon as they identified.

Please indicate you have read, and understood, and will adhere to the Terms and Conditions.

Checked

If your application is successful: If your project application is successful, the Fund Administrator (NIRAS) will ask you to provide some financial evidence for due diligence checks before you receive your project grant. (Please see section 3.3 of the Darwin Plus Local Finance Guidance). Please be ready to provide this evidence promptly.

Financial evidence for organisations: Year-end financial statements, the latest management accounts or audited accounts (if you have these).

Financial evidence for individuals: Proof of identity such as a passport, ID card or driving licence and solvency (such as bank statements) and a police check.

Section 11 - Certification

Certification

I certify that, to the best of my knowledge and belief, the statements made in this application are true and the information provided is correct.

Checked

I have the authority to submit an application on behalf of my organisation.

Checked

Name: Heather Koldewey

Position in the organisation: (if applicable) Head of the Bertarelli Foundation's Marine Science Programme - Conservation and Policy

Signature (please upload e-signature)  [HeatherSignature](#)
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Date: 14 February 2023

Section 12 - Submission Checklist

Checklist for submission

	Check
I have read the Guidance documents, including the “Darwin Plus Local Guidance” and the “Darwin Plus Local Finance Guidance”.	Checked
If my proposed project takes place on public lands or water, I have uploaded a Letter of Support from Government.	Checked
I have uploaded a cover letter that details the information requested in the guidance (Guidance section 4.2 has information on what this cover letter should include).	Checked
I have read, and can meet, the current Terms and Conditions for this fund.	Checked
I have provided actual start and end dates for the project.	Checked
I have provided my summary budget based on UK government financial years i.e. 1 April – 31 March and in GBP in the application form.	Checked
I have uploaded my project implementation timetable using the specific template provided.	Checked
(If copying and pasting into Flexi-Grant) I have checked that all my responses have been successfully copied into the online application form.	Checked
The application has been signed by a suitably authorised individual (clear electronic or scanned signatures are acceptable).	Checked
I have checked the Darwin Plus website immediately prior to submission to ensure there are no late updates.	Checked
I have read and understood the Privacy Notice on the Darwin Plus website.	Checked

We would like to keep in touch!

Please check this box if you would be happy for the lead applicant (Flexi-Grant Account Holder) and project leader (if different) to be added to our mailing list. Through our mailing list we share updates on upcoming and current application rounds under Darwin Plus. We also provide occasional updates on other UK Government activities related to biodiversity conservation and share project news. You are free to unsubscribe at any time.

Checked

Data protection and use of personal data

Information supplied in the application form, including personal data, will be used by Defra as set out in the **Privacy Notice**, available from the [Forms and Guidance Portal](#).

This **Privacy Notice must be provided to all individuals** whose personal data is supplied in the application form. Some information may be used when publicising Darwin Plus including project details (usually title, lead partner, project leader, location, and total grant value).

Project Title: A plastics solution in BIOT

Darwin Plus Local

Provide a **Project Implementation Timetable** that shows the key milestones in project activities. Complete the following table as appropriate to describe the intended workplan for your project. Projects are based on UK Financial Years (**1 April – 31 March** - therefore starts April 2023).

Please add/remove columns to reflect the length of your project. For each activity (add/remove rows as appropriate) indicate the number of months it will last, and shade only the months in which an activity will be carried out. The workplan can span multiple pages if necessary.

Activity #	Description (max 25 words)	No. of months	UK Financial Year 2023/24											
			Calendar Year 2023									Calendar Year 2024		
			Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1	Finalise grant agreement and contracts													
2	Team kick-off meeting													
3	Background research													
4	Site visit to DG													
5	Post-trip meeting and reporting scope													
6	Gather costs and logistics information													
7	Write feasibility report													
8	Gather feedback from stakeholders and incorporate													
9	Final team meeting													
10	Finalise and submit report													

Project Title: A plastics solution in BIOT

Activity #	Description (max 25 words)	No. of months	UK Financial Year 2023/24											
			Calendar Year 2023									Calendar Year 2024		
			Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar