

Darwin Plus: Overseas Territories Environment and Climate Fund Annual Report

To be completed with reference to the "Project Reporting Information Note"
(<https://darwinplus.org.uk/resources/information-notes>)

It is expected that this report will be a **maximum of 20 pages** in length, excluding annexes)

Submission Deadline: 30th April 2023

Submit to: BCF-Reports@niras.com including your project ref in the subject line

Darwin Plus Project Information

Project reference	DPLUS151
Project title	Building knowledge on invasive non-native species in Diego Garcia
Territory(ies)	British Indian Ocean Territory (with links to Gibraltar)
Lead Partner	UKCEH
Project partner(s)	BIOT Administration (BIOTA) SWCA Environmental Consultants Natural History Museum Gibraltar Botanic Gardens
Darwin Plus grant value	£355,190
Start/end dates of project	September 2021 – March 2024
Reporting period (e.g. Apr 2022-Mar 2023) and number (e.g. Annual Report 1, 2)	April 2022 - March 2023: Annual Report 2
Project Leader name	Helen Roy
Project website/blog/social media	https://www.ceh.ac.uk/our-science/projects/building-knowledge-invasive-non-native-species-diego-garcia
Report author(s) and date	Jodey Peyton, Helen Roy, BIOT Administration, Keith Bensusan, Rhian Guillem, Danielle Frohlich, Ben Price, Tim Adriaens, Chris Malumphy, James Millett, Nadine Mitschunas, Wolfgang Rabitsch, Elena Tricarico and Karsten Schonrogge 30 th April 2023

1. Project summary

Human aided introductions of invasive non-native species (INNS), their establishment and spread are globally recognised for negative impacts on native biodiversity, human health and/or the economy (e.g. cane toad (*Rhinella marina*), several ants) (Díaz et al. 2019). Biodiversity impacts can be particularly large on islands and hence mitigating the impacts of INNS is critical to conserving endemic and native species on islands (Russell et al. 2017).

Significant knowledge gaps of native and INNS distributions and INNS impacts in UKOTs lead to uncertainty in the prioritisation of management actions, biosecurity, and conservation planning. Working with the BIOT Administration (BIOTA), we will deliver amphibian, reptile, invertebrate (including ants and scale insects for further analysis of interactions) and plant surveys to address some of these gaps on the island of Diego Garcia in the UK Overseas

Territory of the British Indian Ocean Territory (BIOT) (*Figure 1*) through two field campaigns in June 2022 and June 2023.



Figure 1. Location of the study area - Diego Garcia in the British Indian Ocean Territory (©Google Maps, created 2022).

Our project targets the Darwin priority “*To tackle invasive non-native species*” by delivering a comprehensive dataset of INNS which will support INNS management on Diego Garcia. It will help deliver BIOTA’s conservation priorities of management and prevention of new INNS arriving:

1. *To prevent the introduction of new INNS through effective biosecurity measures.*
 - a. In this project, we collaborate closely with local authorities and key stakeholders.
 - b. We have co-created communication materials with project partners and stakeholders relevant for Environment officers, military and civilian staff, biosecurity authorities in Diego Garcia and at key aviation and Navy Support entry points which will increase awareness of biosecurity issues and, through increasing knowledge and capacity building, mitigate impacts of existing- and prevent future introductions of INNS on Diego Garcia and the wider archipelago.
 - c. Working with the GB Non-Native Species Secretariat, we deliver training in INNS surveillance through field visits, presentations and workshops.
 - d. By “training trainers” of Diego Garcia civilian staff, we build capacity for biosecurity and INNS awareness beyond the lifetime of the project.
 - e. A knowledge exchange and identification training workshop for environment and biosecurity staff on the most common invasive ant species will be made available across all UKOTs.

2. *To manage and where possible eradicate INNS through active programmes of control.* We achieve this by conducting a comprehensive baseline survey across taxonomic groups and including native, non-native and invasive species on Diego Garcia in 2022 and 2023. Using this baseline dataset, BIOTA, supported by our team, develops species-specific management plans.
 - a. Using a variety of entomological surveys, we catalogue a range of invertebrate taxa on Diego Garcia.
 - b. Standardised and opportunistic sampling provides an updated georeferenced inventory of terrestrial species on Diego Garcia.
 - c. Using these georeferenced data, we will generate “risk maps” (e.g. heat map of number of INNS with the potential to spread to the outer archipelago).

d. We work with BIOTA and other stakeholders (ZSL, CCT and Kew) to develop species action / management plans, with the maps helping to target management for focal native- and INN species.

3. *To encourage and support high quality scientific work, both in support of our management and strategic objectives and to enhance our knowledge of the natural environment.*

- a. We expect our DNA-barcoding work and entomological expertise to significantly build on previous work describing Diego Garcia endemics.
- b. Verified entomological (including genetic) and botanical data will be publicly available via Open Access platforms, e.g. the Global Biodiversity Information Facility (GBIF) and the Barcode of Life Database (BOLD), which will support future research and management.
- c. The project will provide for the first time DNA-barcodes, supporting species identification for difficult to identify invertebrate taxa or immature stages. This will facilitate future meta-barcoding approaches using bulk samples and environmental DNA, allowing surveillance at greatly reduced costs.

Our project supports **two [strategic priorities](#)** for the UK Government's plan for UKOTs by directly addressing and supporting the delivery of:

i. *obtaining data on the location and status of biodiversity interests and the human activities affecting biodiversity to inform the preparation of policies and management plans (including baseline survey and subsequent monitoring);*

Through comprehensive surveys across Diego Garcia, we deliver a unique dataset for the understanding of biodiversity on Diego Garcia, the state of INNS and their impacts (points 2a-c above).

ii. *preventing the establishment of invasive alien species, and eradicating or controlling species that have already become established*

Through the surveys, we identify areas for potential further spread of INNS, to evaluate risks to the native fauna and flora from INNS. Data will be used to develop evidence-based management plans (points 1-2 above).

The project also contributes to the following targets and recommendations:

1. 2019 [Environmental Audit Committee](#) inquiry into Invasive Species supports the implementation of actions preventing introduction of INNS: WP5 will increase biosecurity training on Diego Garcia and will deliver co-designed communication materials with information on impacts of INNS (points 1-2 above).
2. Previously Aichi target 9 of the Convention on Biological Diversity to which the UK is a signatory (COP/10/INF/12/Rev.1) and currently "Kunming-Montreal Global Biodiversity Framework" (GBF) Target 6: Our project will be identifying INNS present on Diego Garcia to fully understand their impacts, to support BIOTA in mitigating impacts to native species. By creating species-specific management plans, we will help BIOTA prioritise management of INNS (points 1-3 above). Aichi target 9 has been superseded by Target 6 of the Global Biodiversity Framework <https://www.cbd.int/doc/c/abb5/591f/2e46096d3f0330b08ce87a45/wg2020-03-03-en.pdf>

2. Project stakeholders/partners

Since the project started in September 2021, the team has had quarterly team meetings via the online platform Zoom, and multiple work package meetings via Zoom and Teams. In addition, the team has met on multiple occasions with stakeholders from the US Navy Support Facility (based in Hawaii) in relation to invertebrate sampling work they undertook in January 2022 (Annex 3.1 for the sites that were sampled by UKCEH and some of which were sampled by the US Navy Support Facility) and their biosecurity training in February 2023. The US Navy Support Facility used the sampling locations we allocated and the sampling methodologies we

designed in their 2022 survey increasing the sampling effort at each location. In addition, we have supported the US Navy Support Facility with identifications for records from their survey they added to the Ecdysis portal and iNaturalist. The UKOTs team at Kew created an iNaturalist site <https://www.inaturalist.org/projects/the-terrestrial-biodiversity-of-the-british-indian-ocean-territory-chagos-archipelago> for BIOT in 2018. We have been adding to the records on this website throughout the project. The Gibraltar Botanic Gardens (GBG) team trained the US Navy Support Public Works Department (PWD) in ant survey techniques which are now carried out regularly at the Port and Airport. The aim of these surveys is to alert BIOTA of newly detected introduced species.

Throughout the fieldwork and logistics planning, we work closely with BIOTA to review the work planning. The BIOT Expedition permit system includes detailed information on the fieldwork planning that BIOTA approve. As part of the permitting and visiting system, the Environment Officer on Diego Garcia organised UK and US military personnel to receive text on improving biosecurity before staff visit the island.

We collaborated with BIOTA to create an evaluation form for the biosecurity training (Annex 3.2). The Environment Officer on Diego Garcia started to use the form to evaluate Biosecurity training to military staff in February 2022. We have sent BIOTA a draft Biosecurity Manual (based on the Tristan da Cunha Biosecurity Manual created by the GB Non-Native Species Secretariat) for review. This document will be updated as and when needed but its primary role is to provide a “one-stop-shop” for locating biosecurity materials created for BIOTA.

UKCEH and the GB Non-Native Species Secretariat are updating the biosecurity training presentation to be given by BIOTA to new staff on Diego Garcia. This training will be supplemented with a Biosecurity leaflet (Annex 3.3) and miniguides (Annex 3.4). UKCEH and the GB Non-Native Species Secretariat reviewed the Interception Database for Diego Garcia by Customs Teams that is available for use on island. No edits were made.

The project lead, Jodey Peyton has quarterly catch-up meetings with Zoological Society London and Chagos Conservation Trust staff to update them on project activities, review synergies and plan logistics of trips through our three Darwin Plus projects. This has proved particularly useful in terms of early specimen collection when the ZSL teams and BIOTA have been on Diego Garcia. When the UKCEH team visited Diego Garcia in 2022, we worked alongside ZSL on a Science Event run by BIOTA on island. ZSL have also provided excellent support to the DPLUS151 team in respect of planning the survey. Our team have maintained regular updates with the ZSL team on species IDs and resources as they have become available.

The WP1 plant team are in regular contact with some of the UKOTs team at Kew to both review the work previously undertaken on Diego Garcia (Bárrios and Wilkinson 2018) and to see where the project can further build on recommendations outlined in their report. Kew were instrumental in supporting the compilation of species lists for WP1 reporting forms Diego Garcia. This collaboration has resulted in the additional support from Meise Botanic Garden in Belgium, who, self-funded, will be accompanying the 2023 trip to Diego Garcia to support the botanical survey. The collaborations between this project. And external partners should lead to a published compendium on The Plants of BIOT. Additional stakeholder engagement has been undertaken via iNaturalist training with two US Navy Support Facility staff based on Diego Garcia and in Japan in March 2022 to support biological recording on Diego Garcia and other Bases (to increase knowledge gaps on species).

In 2021/2022 we met with the UKOT Conservation Forum and the Species Recovery Trust to review project methodologies, deliveries and communications to identify synergies between the projects such as discussions over sampling methods and kit with the Species Recovery Trust (SRT)¹. Relations with both UKOTCF and SRT have been maintained throughout the project working on other UKOTs for other DPLUS and UKRI funded research. UKCEH also co-designed a conference on invasive species with UKOTCF, held in March 2023, which included a workshop on management of cane toads.

Finally, the project stakeholder network was extended beyond the immediate project stakeholders, through an extended stay, with the 7 nights' accommodation and car hire funded

¹ Meeting agendas and actions are available on request.

by DPLUS151, on an existing trip for Jodey Peyton (Project Leader at the time) on St Helena to support ant surveying and collecting of iNaturalist records for the St Helena Research Institute, based on the survey methods undertaken on BIOT. This one-week extended trip led to the collection of seven ant species across the wider landscape on St Helena and the addition of 547 iNaturalist records by Jodey Peyton to the following page set up by Jodey and shared with the team from the St Helena Research Institute <https://www.inaturalist.org/projects/the-biodiversity-of-st-helena>. The records from this page can be incorporated into the St Helena Research Institute database. The survey work undertaken by Jodey resulted in further links being developed with ant experts at Fera in the UK and a partner in this project, which have resulted in the co-design, between the DPLUS151 team and Fera, of the following Facebook page, supporting ant identification across the UKOTs: <https://www.facebook.com/people/Ants-of-the-UK-Overseas-Territories/100090289091315/>. This recently established page (February 2023) already has 40 followers.

3. Project progress

Changes to LogFrame Year 1:

The following changes have been made to the original LogFrame after the start of the project and were approved through Change Request 2:

0.1a Data available from species surveys carried out on at least 10 fixed points across DG, identifying presence / absence and abundance of both native and non-native and INNS species by Y3Q2. (added Q2)

3.1 A Communication Plan identifying how outputs will be disseminated and embedded into the main responsible institutions on BIOT and in third countries (on pathways) by Y1Q4. (changed from Y1Q1 as the project had not yet started in Q1)

Changes to LogFrame Year 2:

Other than minor text formatting updates, the following changes have been made to the accepted project LogFrame after the start of the project and were approved through Change Request 2. The changes reflect the updated fieldwork schedule following the June 2022 fieldwork on DG and sensitivities in publicising detailed information on staff and the staffing levels for BIOTA.

Measurable Indicators	Means of Verification
	1.2 Copy of central database and summary of data available on project Teams site. UPDATE: amphibian and reptile surveys postponed to 2023 due to travel disruption in 2022.
2.1 At least 2-BIOTA Environment staff trained in species-specific survey methods Y2Q1 and repeated in Y3Q1.	2.1 Staff training log-Evaluation forms, email updates
2.2 Invasive ant awareness and identification video available by Y3Q4	
2.5 Full species inventory available for identified species by Y3Q4.	2.5 Project Teams site and Open Access platform e.g. GBIF and signposted through the Chagos Information Portal.
3.1 A Communication Plan identifying how outputs will be disseminated and embedded into the main responsible institutions on BIOT and in third countries (on pathways) by Y1Q4.	3.1 Communication Plan posted-available for team on project Teams-website due to sensitivities in stakeholders.

3.2 Biosecurity surveys taken by at least 50-230 trained staff demonstrate improvement in skills compared to baseline survey (Baseline to be established by Y2Q4 Y3Q4 with repeat survey carried out Y3Q4).	3.2 Survey report posted on project teams website shared with BIOTA and US Navy Support Facility Environment staff.
3.3 Pathway Action Plans available to support biosecurity recommendations for BIOTA, US Navy Support Facility and military by Y2Q4 Y3Q4 .	
3.4 “Train the trainer” event for Biosecurity and INNS awareness delivered to at least 5 US Navy Support Facility members by GBNNSS and wider project team completed and reported by Y2Q4 Y3Q4 .	

3.1 Progress in carrying out project Activities

Below we outline the Project Activities and their progress towards completion:

Activity 1.1a Survey planning and consultation throughout with BIOTA and BIOT Environmental Teams in selecting the location of at least 10 sampling sites.

Complete: Sixteen sites (8 pairs – Open and Closed canopy) were identified across Diego Garcia before the visit spring 2022. These updated while on the island (see Annex 3.1) for the survey map for the 31 standardised sampling sites.

Activity 1.1b Undertake invertebrate and plant surveys at these sites across DG, during two visits.

First visit complete: Equipment for these surveys was purchased in 2021/2022 financial year, including the purchase of items from Singapore which were shipped to DG in March 2022. The project field team carried out the first of two surveys, which was originally scheduled between 1st June – 1st July 2022. Travel was delayed because of a delayed AMC flight, but the survey took place between the 1st June and 9th July 2022 (inc. travel through Bahrain). The first survey was submitted to BIOTA on 15th July 2022.

A team of 6 ecologists arrived on Diego Garcia on the 17th June 2022. Following island induction, we commenced the standardised and opportunistic sampling as planned (Annex 3.1). Opportunistic records were added to the iNaturalist site set up by Royal Botanic Gardens Kew: <https://uk.inaturalist.org/projects/the-terrestrial-biodiversity-of-the-british-indian-ocean-territory-chagos-archipelago>.

Updates to the individual work packages are given below. Survey data is held on UKCEH Teams site in two databases, one for plants (Annex 3.5a), one for invertebrates (Annex 3.5b). Additional, opportunistic records were made using iNaturalist. These records will be used, if verification is achieved on taxonomy, to supplement the UKCEH lists. In addition, a copy of the UKCEH plant list is shared with Kew via a Google drive folder, to support compilation of a plant checklist for BIOT that is being led by Kew (Annex 3.5a).

WP1: Plant and habitat surveys were undertaken at each of the standardised sampling sites (17 closed sites and 14 open sites). An approximate 50x50m area was paced out and surveyed by two botanists walking over the area, recording the species seen, with plants being identified to species level where possible. Percent cover estimates were given at ground- (<0.5m), shrub- (0.5-5m) and canopy (>5m) layers. Additional habitat information was collected, including leaf litter depth and percent dead wood cover. The data also inform the invertebrate surveys (WP3&4), which were undertaken in the same areas. In addition to the surveys of the standardised sampling sites, opportunistic recording was undertaken at critical interception points (e.g. areas where aggregate is stored and plant seeds could have been brought in as a contaminant).

Over the course of the three weeks of systematic and opportunistic botanical surveys, two hundred and twenty-nine plant species were recorded. Over 50 new records of plants previously not recorded from Diego Garcia were added to the existing Kew plant species list. A few notable invasive plants were found during surveys, including bluestem grass *Andropogon tenuispathus*, a fire-promoting grass that often spreads to new locations via machinery, equipment, soil, and aggregate. It is also a potential seed contaminant of crop seeds and grass

seeds meant for hydroseeding and other erosion control. Because of its propensity to spread fire and apparent limited distribution on the island, it was recommended for removal. Another grass, southern sandbur *Cenchrus echinatus*, was found in one location during opportunistic surveys of the island. This species was recommended for removal due to its negative impacts on seabirds. The seedheads have barbed spines which facilitate dispersal by animals. When the seedheads attach to the animal, they can penetrate feathers or fur, causing irritation and injury. This is especially harmful to young chicks, as they are often unable to remove the seeds on their own and may suffer while the parents are out foraging. This species is listed as invasive throughout the Pacific and Indian Ocean. A third species, river tamarind *Leucaena leucocephala*, a fast-growing species that ranks among the top 100 worst invasive species in the world (Lowe et al. 2000) for its ability to outcompete native and more desirable species and alter soil chemistry, was also found to be of limited distribution and recommended for eradication.

WP3&4: Both structured and opportunistic sampling for invertebrates was undertaken during the field work. Methods for collecting included suction sampling (n=1207), sweep netting (n=682), leaf litter sieving (n=600), pootering (n=3,605), hand collecting (n=37), malaise trapping (n=484) and light trapping (n=952). All samples were stored in 95% ethanol on the island and transferred to 99% ethanol on return to UK and Gibraltar for preservation and potential further molecular analyses.

Activity 1.2 Undertake 20 amphibian and reptile surveys (following existing protocols), during two visits.

Partially complete: The experts team members who planned to undertake the survey had to return to their home countries following an extended stay in Bahrain. The LogFrame was updated (Annex 1) and approved by NIRAS-LTS with a request to change the delivery date to 2023 when the team will have another opportunity to visit Diego Garcia.

In the absence of the taxon experts, the team members were still able to sample environmental DNA (eDNA) from 15 sites, in order to test whether the presence and distribution of cane toads can be deduced even without visual confirmation in the water. eDNA sampling was opportunistic and was not part of the original proposal. We have taken the opportunity to collect eDNA alongside invertebrate specimens to assess its value for surveying cane toads on remote islands. Preliminary results suggest that an eDNA approach can detect cane toads as part of environmental studies such as this, although classic survey methods (visual surveys, sound) would be recommended for quantifying species abundance and to identify reproduction sites. Further, soil and water samples represent taxonomic groups typically found in such environments, including diatoms, rotifers, nematodes, molluscs and fungi.

As the amphibian and reptile surveys had to be postponed following the extended stay in Bahrain, the team decided to organise an online knowledge brokerage event on 8th March 2023 in collaboration with the UKOT Conservation Forum.

Activity 1.3 At least two supplementary invertebrate sampling undertaken by BIOTA in between main fieldwork trips (see Output 2).

Complete: Samples were collected by BIOTA and ZSL from Diego Garcia on the 24th October 2021. Samples were collected from Egmont on the 26th and 27th October 2021. These invertebrate samples were identified by Fera (see Annex 3.6). In addition, as requested through the project, biological records have been added to the iNaturalist page by BIOTA <https://uk.inaturalist.org/projects/the-terrestrial-biodiversity-of-the-british-indian-ocean-territory-chagos-archipelago>.

Activity 1.4 GBG identify ant material from visits and through subsequent surveys from BIOTA (see 1.3), mapping their distributions, estimating abundance, increasing their reference collection and serving as knowledge centre on non-native ants for the other UKOTs.

Complete: The GBG team have processed over 2,740 ant samples collected and are curating photographs of the specimens to support future identifications. Eleven species of ant had been recorded from BIOT before our survey and not every record was verified. The Gibraltar Botanic Gardens team has recorded 25 species of ants, most or all presumed non-native. Most have

been identified to species level and they include some well-known invasive species such as the Tropical Fire Ant (TFA) *Solenopsis geminata* (previously recorded) and Destructive Trailing Ant (DTA) *Trichomyrmex destructor* (previously unknown from BIOT), for immense ecological impacts and are known to be a nuisance to humans in other parts of their ranges. Our surveys have at least doubled the number of known ant species on DG, but it seems that two notorious invaders, the yellow crazy ant, *Anoplolepis gracilipes* and the little fire ant, *Wasmannia auropunctata* might be absent considering current search efforts.

DPLUS151 project partners (GBG) were successful in winning a John Ellerman Foundation grant to further strengthen and build capacity in GBG in ant identification.

Activity 1.5 UKCEH process and identify invertebrate material to morphospecies.

Partially complete: Processing of the samples is still in progress, but some summary highlights are given below:

2. Over 7,500 specimens of at least 32 orders and 60 genera have been sorted and recorded (Annex 3.5b). This is in addition to the records on iNaturalist, which where possible, have been identified by team members and the wider citizen science community.
3. New records of groups that were not previously recorded from Diego Garcia (final and formal identification is still pending).
 - a. one (or two) mantid species,
 - b. soil centipedes (one or two Geophilomorpha, one Lithobiomorpha, one or two Scolopendromorpha),
 - c. treehoppers (one Membracidae, one Derbidae, one Flatidae, at least five different Cicadellidae)
 - d. ground beetles (at least four Carabidae species).
4. The project database holds a large diversity of spiders, especially jumping spiders. With support from the Oxford Natural History Museum (OUNHM), potentially 30+ morphospecies have been recorded to be verified.
5. We anticipate we have recorded all three endemic Orthoptera species, but also one species of pygmy mole crickets (Tridactylidae), another group not yet known from Diego Garcia.
6. *Hemiptera: Sternorrhyncha:* More than 250 samples/observations of scale insects and related groups (aphids, whiteflies and psyllids) were recorded in Diego Garcia on 45+ plant species. It is not possible to give an exact number of scale insect species found at this time as they can only be accurately identified using slide-mounted specimens under a high-power microscope (in progress). However, an estimated 20 species of scale insect have been provisionally recorded of which 12 appear to be new for BIOT; 4 species of whitefly have been recorded of which 3 appear to be first records for the island.
7. In addition to the physical samples, photo records were submitted to iNaturalist <https://uk.inaturalist.org/projects/the-terrestrial-biodiversity-of-the-british-indian-ocean-territory-chagos-archipelago> which include some species not recorded through the sampling.
 - a. Number of iNaturalist records on 15/06/2022: 130 observations, 86 species, 20 observers and 118 identifiers.
 - b. Number of iNaturalist records on 20/10/2022: 814 observations, 268 species, 31 observers and 182 identifiers. This shows a significant increase in the records for Diego Garcia and will support future identifications for both conservation and management (in terms of recording INNS distribution and future spread). Once verified, Research Grade records will be ultimately added to GBIF from iNaturalist.
 - c. Through liaison with the US Navy Support Facility, we have supported and encouraged the addition of records to the iNaturalist site from the January 2022 survey. Over 150 records have been added by this team to date.
 - d. Additional records have been added to the iNaturalist site by the BIOT Chief Scientific Advisor, with support from the DPLUS151 team.

Activity 1.6a The project team undertakes species level identification.

Complete (but this will be expanded upon in the final year of the project). This work is ongoing but through the database and iNaturalist (see Activity 1.5).

Activity 1.6b NHM undertakes the DNA barcoding on at least 150 invertebrate samples.

Many samples (>150) already in hand and lab work will commence in April 2023 and be finished by end July 2023. The next batch will be done as soon as delivered to NHM.

Activity 1.7 Species distribution maps are generated from survey data (see 1.1 to 1.3) with GIS software.

This work will be undertaken in the FY 2023/24.

Activity 1.8 "Heat maps" of any INNS records of potential concern are produced using data from 1.7.

This work will be undertaken in the FY 2023/24.

In addition to the survey results outlined above, 27 opportunistic bird records were made by a member of the team, including a potentially new nesting site for the white-tailed tropicbird. These records were submitted to Pete Carr from the Chagos Conservation Trust who coordinates the eBird list: <https://ebird.org/region/IO>.

Output 2 Species survey training delivered to BIOTA staff and research outputs shared with at least ten multidiscipline staff on Diego Garcia. WP3, 4 and 5.

Activity 2.1 BIOTA Environment staff trained in species-specific survey methods Y2Q1 and repeated in Y3Q1.

Partially complete: Currently there is only one BIOTA Environment staff member on Diego Garcia so this output will be hard to achieve until another member of staff is recruited. A Change request was submitted (CR7) and approved to reflect this.

Species identification training on plants and invertebrates was given to the BIOTA Environment Officer and the US Navy Support Facility PWD staff member based on the island with responsibility for environmental monitoring. The US Navy Support Facility PWD staff member intends to undertake ant baiting at key points of potential introductions (port, airport and downtown) to support the Early Warning Rapid Response (EWRR) on Diego Garcia for target ant species, such as the little fire ant (*Wasmannia auropunctata*).

In addition to survey training, the project partners, SWCA Environmental Consultants provided an online training workshop on "How to collect herbarium samples". The workshop was attended by the BIOTA Environment Officer and the US Navy Support Facility staff member responsible for environmental monitoring. The aim for the training of the DPLUS151 team, Meise Botanic Garden- and US Navy Support Facility staff is the collection of herbarium voucher specimens for plants not yet recorded on the Kew list to update and document the plant species lists for BIOT.

During the first field trip in June 2022, our research was shared with approximately 50 UK and US military staff, as well as with the US Navy Support PWD.

Activity 2.2 Ant awareness raising- and identification video created by GBG.

Complete: Two videos were created and drafts shared with the BIOTA Environmental Officer (Annex 3.7). In addition to this video, photos and short clips and descriptions of ants from Diego Garcia, as well as ant species from other UKOTs have been added to the Ants of the UKOTs Facebook page <https://www.facebook.com/people/Ants-of-the-UK-Overseas-Territories/100090289091315/>, a page our project helped design and create.

Activity 2.3 Develop (Field Studies Council) beginner ID guide for key species of interest for military and civilian personnel on DG in several languages

Complete: This activity is complete with PDFs being available on the Chagos Conservation Trust website <https://chagosinformationportal.org/portal/publications> (website down at time of report) and as physical copies shipped to the Environment Officer on Diego Garcia in January 2022 (Annex 3.4)

In addition to these miniguides, 20 iNaturalist guides have been created to support field identification of species going forward e.g. Annex 3.8. These can be found here, alongside guides created by Kew:

<https://www.inaturalist.org/guides/search?utf8=%E2%9C%93&q=british+indian+ocean+territory&commit=Search>

Activity 2.4 Meeting held with BIOTA and BIOT Environmental Teams at the end of fieldwork trips to summarise findings.

Partially complete: Complete for the first year of fieldwork: Meetings were held with the US Navy Support Facility and the BIOTA Environment Officer following the completion of fieldwork in July 2022, where summary species lists were presented and next steps outlined. In addition, recommendations for future management for some plant and ants species were presented and discussed. A similar meeting will be held following the completion of fieldwork in 2023. Regular email communication is maintained with the BIOTA and US Navy Support Facility staff.

Activity 2.5 Full detailed species inventory shared with BIOTA and BIOT Environmental Teams and made available via Open Access Platform e.g. GBIF at end of project has been started, with species identified to date having been shared with BIOTA, ZSL and the US Navy Support Facility.

The BIOTA have access to the central invertebrate spreadsheet. Meetings on findings to date have been held with ZSL and CCT and the US Navy Support Facility. Almost 700 records of species recorded on BIOT are now available on iNaturalist through the project and this will be expanded upon in the 2023 trip.

Output 3 At least 20 military and civilian staff on DG have improved knowledge of Biosecurity protocols and surveillance WP5.

Activity 3.1 Draft communication plan and updated Pathway Action Plan including analysis of existing biosecurity measures on DG with US Navy Support Facility (and Bahrain and Singapore if possible) with military and civilian personnel.

Complete but further work will be done in this area in the final year: This is an ongoing activity. The Communication Plan was drafted in 2022 with BIOTA, outlining key stakeholders and messages for the project and how they will be delivered. This is a live document and will be reviewed regularly throughout the project.

The Pathway Action Plan was reviewed as part of the biosecurity work and it was decided it was sufficient for the time being. The extended stay in Bahrain in 2022 did enable us to undertake a desk-based pathways analysis (Annex 3.9) specifically for ants including a horizon scan for Diego Garcia, encompassing the ant faunas of Bahrain, Singapore, Guam, Mauritius, the Seychelles and the Maldives (shipping and flight routes).

This activity is complete with respect to the updated LogFrame as twenty-one military staff have been trained by BIOTA in DG using materials that included the pathway analysis. An additional thirteen contract personnel received biosecurity training as part of their pest management course by the US Navy Support Facility using materials created as part of DPLUS151 in February 2023. These materials included inspection guides, leaflets and a PowerPoint presentation on using iNaturalist.

Activity 3.2 Design and distribute questionnaires as part of Monitoring and Evaluation. Findings used to create sets of practical actions for US Navy Support Facility and biosecurity staff (e.g. customs), which can be undertaken on DG at potential points of introduction / points of exit for outer islands.

Partially complete: Evaluation forms (Annex 3.2) were created for the BIOTA Environment Officer Biosecurity training materials, prepared as part of BIOTA Biosecurity Manual. Inspection guides for Customs and other staff on Diego Garcia are also available through the Biosecurity Manual. Biosecurity Training has been moved to the 3rd year due to the travel disruptions in June 2022.

Activity 3.3 Review and update Pathway Action Plans and compile with biosecurity material guidance

Complete: This activity was undertaken (see 3.1). Biosecurity guidance materials, in the form of updated checklists, identification guides and training videos, packaged in a draft Biosecurity Manual have been created and shared with BIOTA for provision of future training.

Activity 3.4 Work with US Navy Support Facility to design and deliver INNS awareness raising- and biosecurity training for civilian staff on DG (train the trainers), based on data from Activities 3.1-3.3; design and distribute questionnaires as part of M&E. Measure changes in understanding of INNS awareness and biosecurity with staff through questionnaires (based on Activities 3.1 and 3.2 surveys).

Partially complete: “Train the trainer” training has been delayed to the final year due to the June 2022 delayed travel (but see 3.1). The US Navy Support Facility from Hawai’i delivered training to 13 contract personnel. UKCEH has maintained regular contact with the US Navy Support Facility in Hawai’i through 2022/23 and will continue this knowledge-exchange throughout 2023/24.

Output 4 Species action plans created for at least two species, based upon stakeholder consultation. WP6

Activity 4.1 Year 1 and 2 fieldwork data (Output 1) used as a starting point to identify key species of interest / concern for management or conservation priorities during Year 2 field work wash up meeting (part of Output 2.4).

Partially complete: Eight plants were identified during the June 2023 survey as potentially suitable for future spread management or eradication. In addition, one ant species has been identified for management given its apparent limited distribution and cane toads were identified as a species to consider for eradication feasibility. Cane toads are potentially toxic to native amphibian predators and can impact native wildlife through predation, yet impacts vary across spatial and temporal scales. In March 2023, as part of the UKOTCF Invasive Species Conference that UKCEH assisted with organising, a workshop was held online on the 8th March, on the feasibility of eradicating cane toads, with Rick Shine, a world expert on cane toad ecology and management, as guest speaker. The recording was also shared on the web by the UKOTCF

(<https://www.dropbox.com/sh/ig7u9ssa7yclghq/AAAtKz9QjAISsIBSeOR9X4gYa?dl=0>). The general goal of the webinar was for participants to learn about cane toad ecology and impact, to exchange on the cane toad situation on different Overseas Territories, to discuss on biosecurity practices and to assess management feasibility. The webinar was not part of the original proposal but the discussions will be useful for drafting potential management strategies and to evaluate their feasibility.

Activity 4.2 Data and materials / outcomes of meetings from Output 1, 2 and 3 used to draft species management or conservation actions plans for species of interest / concern on DG. Work led by BIOTA with input from wider team.

Partially complete: Guidance for plant (n=8) and ant (n=1) management was shared with the BIOTA Environment Officer. This work will be further developed YR3 (FY 2023/2024).

Activity 4.3 Management and / or conservation action plans finalised.

This work will be further developed YR3 (FY 2023/2024).

Output 5 Research outputs shared with scientific and INNS practitioner audience.

Activity 5.1 Project brief created and added to BIOTA website.

Partially complete: This activity is partially complete with the project brief having been created and shared with the BIOTA and will be added to the new BIOTA website when this is ready. As noted in CR7, if the BIOTA website is not complete before the end of the project, this activity might not be achievable.

Activity 5.2 Popular articles on project written for relevant organisations for sharing updates on project outputs (e.g. UKOTCF newsletter, Darwin Newsletter and MoD Sanctuary magazine).

Complete: This activity is complete with four articles on the project published: three in Chagos News https://chagos-trust.org/images/uploads/documents/Chagos_News_59.pdf

<https://chagos-trust.org/news/the-latest-issue-of-chagos-news-is-out-now> and one for UKOT Conservation Forum Newsletter <https://www.ukotcf.org.uk/forum-news-55-published/> - shared with 314 subscribers), with more articles planned for 2023 in the Darwin Newsletter and Sanctuary Magazine, should they be suitable for publication.

In addition to these articles, the project team were invited to draft text for a book chapter for the Species Recovery Trust for a UKOT Conservation Forum book.

Activity 5.3 Presentation of scientific results at international conferences (oral or poster).

Complete but further opportunities will be sought in the final year of the project to share results. The results of the project to date were reported at the UKOTCF Invasive Species Conference on the 7th March 2023 that UKCEH helped organise. The total number of registrations was 111 for the event, but we are aware that the link was shared with some colleagues and that in some cases more than one person was using the Zoom account, so the numbers are likely to be slightly higher than indicated. On Day 1 the most participants we had attending at one time was 41 and on Day 2 it was 44 (the day the DPLUS151 presentation (Annex 3.10) was played).

Activity 5.4 Journal article on INNS on Diego Garcia submitted to open access journal.

Partially complete: A draft manuscript has been written on the Hemiptera of BIOT has been drafted and will be submitted to a journal following the results of the 2023 field trip. Further publications in peer reviewed journals should follow.

3.2 Progress towards project Outputs

The Project Monitoring and Evaluation Table has been added to Annex 2 for ease of reference for given Means of Verification.

Outputs	Measurable Indicators	Update
Output 1. Native and non-native species inventory and distribution maps produced for amphibians, reptiles, invertebrates and plants WP1-4.	1.1 Database holds data from invertebrate sampling and plant surveys from 10+ locations by Y2Q1 and Y3Q1.	<p>5/8 indicators are complete or are partially addressed:</p> <p>Physical and online records collected from 31 sampling locations, as well as opportunistic sampling in Diego Garcia. The database contains information on over 7,500 species. Over 4,300 of these specimens are ants, the majority of which are identified to species. These records supplement the data already collected by BIOTA and ZSL (Indicators 1.1, 1.3, 1.4, 1.5, 2.5, MoV1.1-1.5).</p> <p>An iNaturalist site was set up by Kew in 2018 and at the time of reporting, there were 109 observations of 72 species from 18 observers https://www.inaturalist.org/observations?project_id=27878. The project added almost 700 records during the June 2022 field trip.</p> <p>It is considered that the indicators and accompanying means of verification are at present suitable to verify project delivery.</p>
	1.2 Database holds data from repeat amphibian and reptile surveys (following 2013 military baseline survey) by Y3Q1.	
	1.3 Database holds data from samples collected by BIOTA and shipped to UK by Y3Q1.	
	1.4 Database holds data from at least 50 ant samples by Y3Q1.	
	1.5 Database holds data from UKCEH/EAA processing of all (plant and non-ant invertebrate) by Y3Q1.	
	1.6 Database holds DNA bar-coding data on 150 invertebrate samples samples by Y3Q2.	
	1.7 Species distribution maps available by Y3Q2.	
	1.8 "Heat maps" with potential INNS risk areas available by Y3Q2.	
Output 2. Species survey training delivered to BIOTA staff and research outputs shared with at least ten multidiscipline staff on DG. WP3, 4 and 5.	2.1 BIOTA Environment staff trained in species-specific survey methods Y2Q1 and repeated in Y3Q1.	<p>All 5 indicators are complete or are partially addressed:</p> <p>Training on biosecurity and species surveys has been undertaken on Diego Garcia, but with limited supporting materials to aid the training. We have created a draft Biosecurity Manual to support the induction of new Environmental Officers. This manual consists of materials for training customs staff and other personnel on Diego Garcia, such as the Biosecurity Leaflet for customs and</p>
	2.2 Invasive ant awareness and identification video available by Y3Q4.	
	2.3 FSC "miniguide" created by Y2Q1.	
	2.4 At least two survey feedback meetings held with BIOTA and US Navy Support Facility documented by Y3Q1.	

	<p>2.5 Full species inventory available for identified species by Y3Q4.</p>	<p>immigrations officers on INNS (Annex 3.3) and miniguide (Annex 3.4). In addition, we have created an ant awareness raising presentation (Indicator 2.2). Working with BIOTA, we have created a PDF and card miniguide to INNS for military and civilian staff on DG to be aware of (Annex 3.4) (Indicator 2.3, shared on the Chagos Information Portal: (MoV2.3)), created a biosecurity leaflet for Customs and Immigration officers (Annex 3.3) (Indicator 2.3).</p> <p>We have shared species lists from sampling surveys (Activity 1.3), with BIOTA, ZSL and the US Navy Support Facility and added these records to the central Teams site (see also Indicators 1.1, 1.3, 1.5, 2.5, MoV1.1-1.5).</p> <p>At this stage in the project we do not have further updates, but consider that the progress towards delivering Output 2 s on course for the project completion and that the means of verification are adequate.</p>
<p>Output 3 At least 20 military and civilian staff on DG have improved knowledge of Biosecurity protocols and surveillance WP5.</p>	<p>3.1 A Communication Plan identifying how outputs will be disseminated and embedded into the main responsible institutions on BIOT and in third countries (on pathways) by Y1Q4.</p> <p>3.2 Biosecurity surveys taken by at least 20 trained staff demonstrate improvement in skills compared to baseline survey (Baseline to be established by Y3Q4).</p> <p>3.3 Pathway Action Plans available to support biosecurity recommendations for BIOTA, US Navy Support Facility and military by Y3Q4.</p> <p>3.4 “Train the trainer” event for Biosecurity and INNS awareness delivered to at least 5 US Navy Support Facility members by GBNNSS and wider project team completed and reported by Y3Q4.</p>	<p>3/4 of the indicators are complete or partially addressed:</p> <p>Using the Communication Plan (Indicator 3.1), in year 1, we identified individuals to receive training in Biosecurity). Thirty-four staff on Diego Garcia have received biosecurity training using guidance and presentations updated throughout the project (Indicator 3.2).</p> <p>As indicated in reporting updates for Output 2, biosecurity training has been given, but we are supplementing and building on this training and providing “Train the Trainer” and further biosecurity training in the final year of the project (Indicators 3.3 and 3.4).</p> <p>Pathway Action Plans were reviewed during the stay in Bahrain in June 2022 and considered still applicable and not needed to be updated. In addition, Ant Pathway analysis was created and updated during the June 2022 trip (Indicator 3.1 and 3.3).</p> <p>██ ██ ██ ██ ██ ██</p> <p>At this stage in the project we do not have further updates, but consider that the progress towards delivering Output 3 s on course for the project completion and that the remaining Means of Verification are adequate</p>

Output 4. Species action plans created for at least two species, based upon stakeholder consultation. WP6	4.1 The identification of at least 2 species of interest/concern for management or conservation action plans by Y3Q1	<p>2/3 of the indicators are complete or partially addressed:</p> <p>Data collation for this Output has started (Activity 1.3). Following the first year of fieldwork eight plant species were identified for management and or eradication, and one species of ant. In addition, the team will review the desirability and feasibility of management of cane toads on Diego Garcia considering available management options (e.g. exclusion fencing).</p> <p>At this stage all the indicators and MoV are considered relevant.</p>
	4.2 Draft management plans for at least 2 species of interest / concern available by Y3Q2.	
	4.3 Peer reviewed Management plans available by Y3Q3.	
Output 5. Research outputs shared with wider scientific and INNS practitioner audience	5.1 Project brief downloaded from BIOTA website at least 20 times by Y3Q4.	<p>All 4 indicators are complete or partially addressed:</p> <p>A project brief (Indicator 5.1) was created in year one and will be shared on the BIOTA website alongside the June 2022 Expedition survey report when the website is updated.</p> <p>Indicator 5.2 is complete with four articles on the project published: three in Chagos News https://chagos-trust.org/images/uploads/documents/Chagos_News_59.pdf https://chagos-trust.org/news/the-latest-issue-of-chagos-news-is-out-now and one for UKOT Conservation Forum Newsletter https://www.ukotcf.org.uk/forum-news-55-published/ - shared with 314 subscribers), with more articles planned for 2023 in the Darwin Newsletter and Sanctuary Magazine, should they be suitable for publication.</p> <p>In addition to these articles, the project team were invited to draft text for a book chapter for the SRT for a UKOTCF book.</p> <p>Results of the work to date were shared during the UKOTCF Invasive Species Conference on the 7th March 2023.</p> <p>(Indicator 5.2 and MoV 5.2).</p> <p>This Output will be further developed in year 3 of the project. At this stage all the indicators and MoV are considered relevant.</p>
	5.2 At least 4 lay articles published by Y3Q4.	
	5.3 Publication of scientific results at international conference proceeding (oral or poster) by Y3Q4.	
	5.4 One Journal article on INNS on DG submitted to Open Access journal by Y3Q3.	

3.3 Progress towards the project Outcome

Outcome	Measurable Indicators	Update
Updated species inventories and maps inform BIOT conservation strategy including capacity building for INNS surveillance and biosecurity, ultimately reducing the rate of INNS	<p>0.1a Data available from species surveys carried out on at least 10 fixed points across DG, identifying presence / absence and abundance of both native and non-native and INNS species by Y3Q2.</p> <p>0.1b Data available to key biosecurity staff on distribution of at least 20 INNS (or potential INNS) on DG linked to possible</p>	<p>All indicators have been addressed:</p> <p>Almost 700 iNaturalist records are already openly available from the second year of the project. In addition, the UKCEH database holds data on more than 7,500 specimens collected from Diego Garcia through opportunistic and standardised sampling (Annex 3.1 gives a map of the sites) from the UKCEH and ZSL-BIOTA trips. These specimens are with experts at the</p>

<p>introductions and spread to outer islands.</p>	<p>points of entry, habitats and to risks of spread from DG to outer islands by Y3Q2.</p> <p>0.2 Surveillance protocols for priority INNS are available and incorporated in to BIOTA work plans/ procedures that will be implemented beyond the life of this project by Y3Q2.</p> <p>0.3 At least 20 staff on DG (BIOTA, US Navy Support Facility, military, civilian) demonstrate improved understanding of invasive species management and surveillance Y3Q1.</p> <p>0.4 Species actions plans for at least 2 species of interest agreed with BIOTA and US Navy Support Facility by Y3Q3.</p> <p>0.5 Four popular articles, one scientific paper and 1 conference proceeding include project findings by Y3Q4.</p>	<p>Gibraltar Botanic Garden, the Natural History Museum and Fera. Records of species are also present on iNaturalist, demonstrating the distribution of species around the island (Indicator 0.1a and MoV 0.1a and 0.1b) (Activity 1.3).</p> <p>Data from the June 2022 trip (Activity 1.3) was made available to BIOTA, ZSL and the US Navy Support Facility (Indicator 0.1a).</p> <p>Plant and ant survey protocols were shared with US Navy Support Facility staff and BIOTA Environment Officer during the June 2022 trip (Indicator 0.2).</p> <p>Thirty-four staff on DG received biosecurity training using guidance and presentations updated throughout the project since September 2021. iNaturalist training given to US Navy Support Facility staff to support opportunistic recording from DG (Output 2). (Indicator 0.3).</p> <p>Evaluation forms have been drafted as part of Output 2 and Output 3 (Indicator 2.1, Indicator 3.2).</p> <p>Species have been identified for management or suitability of management on Diego Garcia.</p> <p>0.5 – complete - 4 popular articles have been drafted and shared (Indicator 0.5, Indicator 5.2). One conference presentation on the results of the project to date (7th March 2023) Indicator 5.3.</p> <p>The project Activities and Outputs will be further developed in year 2 and year 3 of following biosecurity training, fieldwork and sample identifications. Given the progress to date, we are confident that we will be able to complete the project and that all the Outcome indicators and MoV are relevant</p>
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3.4 Monitoring of assumptions

A UKCEH internal risk register was created at the start of the project. This risk register is reviewed monthly. Additional risks raised to the project were the spread of Covid-19 between countries as travel to DG is undertaken and also the risks of fieldwork not being possible due to either war or actions following recent territorial disputes.

The following list is the assumptions outlined in the approved LogFrame (Annex 2):

Assumption 0.1: *Major field activities are not cancelled due to COVID-19 restrictions.* **This assumption holds true as COVID-19 is an ongoing situation. Monitoring possible travel restrictions is part of the monthly risk register review.**

Assumption 0.2: *Species surveys accurately identify both native and INNS present on DG.* **This assumption holds true. Invertebrate species identifications from tropical regions can be challenging. We have reduced the risk of not being able to identify species by working with an international team of experts.**

Assumption 0.3: *Information on native and INNS occurrence and distribution usefully informs Environmental Teams on DG and enables them to address potential threats of INNS.* **This**

assumption holds true, as having updated abundance and distributional data will support delivery of conservation and management plans.

Assumption 0.4: Organisations in / on pathways BIOT have capacity to engage with work. **This assumption holds true. The BIOTA and US Navy Support Teams are relatively small and so our training and other engagement work will need to be concise and focussed to ensure delivery.**

Assumption 1.1, 2.1 and 3.1: Major field activities are not cancelled due to COVID-19 restrictions. **This assumption holds true as COVID-19 is an ongoing situation. Monitoring possible travel restrictions is part of the monthly risk register review.**

Assumption 1.2 and 2.2: Organisations in BIOT have capacity to engage with work. **This assumption holds true. The BIOTA and US Navy Support Facility Teams are relatively small and so our training and other engagement work will need to be concise and focussed to ensure delivery.**

Assumption 1.3: Identifying to species to family-level will not prevent development of protocols, where species-level identification is not possible. **This assumption holds true – invertebrate species identifications from tropical regions can be challenging. We have reduced the risk of not being able to identify species by working with an international team of experts. We are developing a range of survey protocols to allow for sampling across a range of taxa.**

Assumption 2.3: Partnering organisations have capacity to share / disseminate project information. **This assumption holds true. The BIOTA and US Navy Support Facility Teams are relatively small and so our training and other engagement work will need to be concise and focussed to ensure delivery.**

Assumption 2.4: Validated data is of sufficient quality to be shared on Open Access Platform. **This assumption holds true. Invertebrate species identifications from tropical regions can be challenging. We have reduced the risk of not being able to identify species by working with an international team of experts.**

Assumption 3.2: Organisations in BIOT and in third countries (on pathways) have capacity to engage with work. **This assumption holds true. The customs and military biosecurity teams are relatively small and so our training and other engagement work will need to be concise and focussed to ensure delivery.**

Assumption 4.1: Data is available from complementary cross-organisational surveys, to inform decision making for conservation or management priorities. **This assumption holds true. Data collected will need to be shared in a central location. We have developed a central database to hold this data (Indicator 1.2) to allow for data processing across different organisations.**

Assumption 4.2: Species of interest / concern are identified where clear management actions can be identified and incorporated in to plans **This assumption holds true. Species of interest/concern need to be both identified and conservation/management action needs to be possible. For example, marine INNS are extremely difficult to manage. Comprehensive species lists and distributional information will support decision making.**

Assumption 5.1: Findings are of interest to wider scientific community and INNS practitioners. **This assumption holds true. Updated species inventories may not be considered of interest in their own right. New species records and novel (to island) survey/management techniques should increase the interest of the work. Similarly, methods that can be used by other UKOTs will hopefully also be of interest to a wider community.**

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

Our project targets the Darwin priority “*To tackle invasive non-native species*” by delivering a comprehensive dataset of INNS which will support INNS management on DG.

The delivery of updated locational and abundance data on species of conservation importance (INNS, endemics etc) will help deliver BIOTA’s conservation priorities of management and prevention of new INNS arriving:

1. *To manage and where possible eradicate INNS through active programmes of control.*
2. *To prevent the introduction of new INNS through effective biosecurity measures.*
3. *To encourage and support high quality scientific work, both in support of our management and strategic objectives and to enhance our knowledge of the natural environment.*

Our project supports **two strategic priorities** for the UK Government’s plan for UKOTs by directly addressing and supporting the delivery of:

i. obtaining data on the location and status of biodiversity interests and the human activities affecting biodiversity to inform the preparation of policies and management plans (including baseline survey and subsequent monitoring);

ii. preventing the establishment of invasive alien species, and eradicating or controlling species that have already become established

The project also contributes to the following targets and recommendations:

1. 2019 [Environmental Audit Committee](#) inquiry into Invasive Species supports the implementation of actions preventing introduction of INNS
2. Previously Aichi target 9 of the Convention on Biological Diversity to which the UK is a signatory (COP/10/INF/12/Rev.1) and currently “Kunming-Montreal GBF Target 6.

5. Gender equality and social inclusion

Our project team (UKCEH, SWCA, GBG, GBNNSS, BIOTA, Uni. Florence, EEA, INBO and NHM), has approximately equal numbers of men (7) and women (7) in the project team. We have made the miniguide materials available in multiple languages to ensure messaging across different stakeholder groups available.

	Organisation	Women (7)	Men (7)
Please quantify the proportion of women on the Project Board ² .	UKCEH:	3	1
	SWCA,	1	
	GBG,	1	1
	GBNNSS,		1
	BIOTA,	1	1
	Uni. Florence,	1	
	EEA,		1
	INBO,		1
NHM		1	
	Organisation	Women (5)	Men (4)
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women ³ .	UKCEH:	2	1
	SWCA,	1	
	GBG,	1	1
	BIOTA,	1	1
	NHM		1

² A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

³ Partners that have formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

6. Monitoring and evaluation

Monitoring progress and the evaluation of outputs is mainly achieved during quarterly meetings with all partners (led by UKCEH). All partners are given the opportunity to input to documents like the current report. On specific tasks or outputs (science or logistics) working groups of relevant team members have come together and report outputs/actions back at the larger meeting. UKCEH acts as the administrative hub and maintains a TEAMs site as communication hub, but also as the central repository for the survey database and training and communication material.

The invertebrate project team members will identify species within their core expertise (ants and scales). The additional material will be distributed to experts at the NHM and at other institutions (when there is no expertise available at NHM) for species identification. At least 150 identified species will be barcoded, but the aim is to barcode as many samples as possible, including larvae and instars that are otherwise not identifiable.

7. Lessons learnt

The regular team meetings and email communication have worked extremely well in maintaining relationships and in designing and delivering project tasks to completion. The quarterly updates with ZSL and the Chagos Conservation Trust have also been extremely helpful, and we would recommend others working in the BIOT to adopt a similar process of collaboration and cooperation.

In the first year, ordering materials from Singapore was complicated but we received excellent support and help from the military staff both in Singapore and Diego Garcia, as well as ZSL. For others undertaking the same process we would recommend leaving a long lead in time for both procurement and logistics.

The travel disruption in June 2022 meant that some activities planned for this year had to be postponed to 2023 (the amphibian and reptile surveys and the train-the-trainer work). Flexibility in travel schedules can allow accommodating changes in travel plans, but there will always be limits. Having alternative scenarios ready, particular where travel issues arise early in the project should allow protecting the project objectives.

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

Here we address the Reviewer comments as requested for this annual report. We then go on to complete the report form.

Summary of changes following AR1 Review:

Comments from AR1:

No.	Comment	Discuss with Darwin	Next half year report	Next Annual Report	No response needed
1	Please shorten the project 'summary' – it currently runs to over 4 pages and repeats information that appears later in the report.			X	
2	Explain how the project involves local stakeholders, in terms of planning, decision-making, activities etc			X	
3	Please provide details of training carried out under Output 3 and clarify how many have already taken part			X	
4	Revisit comments from DPAG in the Grant award feedback letter – and respond		X	X	

- 1. Please shorten the project “summary”: – please see “Summary” of this current report:**
- 2. Explain how the project involves local stakeholders, in terms of planning, decision-making, activities etc:**

The BIOT Administration are a partner in the project and have been instrumental in the successful completion of the first season and the drafting of the Biosecurity Manual. In addition to BIOTA, the following stakeholder groups were involved with the planning and execution of activities in the field and the dissemination of knowledge exchange materials:

US Navy Support Facility Public Works Department (PWD) – the project team has worked closely with the US Navy Support Facility PWD, prior to the trip – both the local PWD team on the ground and the US Navy Support Facility team based in Hawaii who work closely with the Diego Garcia PWD team, examined pre-existing survey protocols on Diego Garcia to support co-development of methods for the work we are both doing on Diego Garcia. The US Navy Support Facility PWD member on island accompanied the DPLUS team on both the plant and invertebrate surveys.

Military staff stationed on Diego Garcia – along with the Zoological Society London team expedition on island at the same time as our visit, the Environment Officer and our project team organised a science event on Diego Garcia during the trip (30/06/2022). This event was attended by over 50 people (US and UK military and civilian staff. This event included presentations by the team (Annex 3.11 and gave a demonstration to introduce some of the species we recorded and to encourage biological recording using iNaturalist (e.g., through a Citizen Science campaign to record cane toads (Annex 3.12)). During the event, the team had many communications with these personnel as to species that they have encountered and species that they see to be a problem. Annex 3.13 shows photos from the event.

Local radio - The BIOTA Environmental Officer advised that a good mechanism for communicating with staff stationed on Diego Garcia is through the local radio. As such, the project prepared a radio clip to play on the radio and inform islanders about biosecurity. In addition, we have recorded a script for the island radio about using iNaturalist to further encourage and promote biological recording.

Logistics officer (Singapore) – The Logistics Officer for the British military based in Singapore was instrumental in facilitating the delivery of the shipment of field working equipment to Diego Garcia from Singapore on the cargo ship, the Corsica. As part of the correspondence biosecurity was discussed and the biosecurity leaflet created for military staff shared. Regular meetings with the Logistics Officer and military personnel would be of benefit for understanding pre-border biosecurity for Diego Garcia and we will try to be built on the relationship for the remainder of the project.

- 3. Please provide details of training carried out and clarify how many have already taken part.**

Training under Output 3 (Biosecurity) was carried out by the BIOTA Environment Officer using materials updated through the project (see AR1). Twenty-one military staff underwent this training in 2022. During 2022, two people (the BIOTA Environment Officer and the US Navy Support Facility PWD) have also been trained in field survey methods (plants and invertebrates) and in field collecting methods for curation (plants). In addition, 13 people were trained by the US Navy Support Facility in February 2023, using materials created through DPLUS151 (inspection guides, customs checking leaflet, survey report).

- 4. Revisit comments from DPAG in the Grant Award letter and respond.**

“Some of the methodology does not yet appear fully developed (see comments below) and we are keen to see a revised, robust application before confirming funding.”

4.1 This should also consider project communications and how you will target audiences effectively;

- Our target audiences on Diego Garcia are:

- US Navy Support Facility Diego Garcia;
- BIOTA staff;
- UK and US military staff;
- Civilian personnel on Diego Garcia.
- We have worked with the US Navy Support Facility PWD based on Diego Garcia, the US Navy Support Facility in Hawaii and BIOTA to link to local community outreach points, translating materials into key languages used for staff. We have created miniguides (Annex 3.4), iNaturalist guides (see <https://www.inaturalist.org/guides/search?utf8=%E2%9C%93&q=british+indian+ocean+territory&commit=Search>) and local radio clips to share messages about recording and biosecurity.
- The project team also supported the UKOT Conservation Forum in developing and organising the 2023 Invasive Species Conference in March 2023 and gave two presentations and organised the cane toad workshop. Working with the UKOTCF promotes the work we are doing across the UKOTs.
- In the 2023/24 FY visit to Diego Garcia, we also intend to host a citizen science event for biological recording.

4.2 The project does not appear to have strong local ownership of any kind so it is not clear who will ensure the work continues and how (address in half year report – HYR);

- With the BIOT Administration as project partners there is strong local ownership. In addition, through the relationships developed with the US Navy Support Facility, ZSL, Kew and the Chagos Conservation Trust, we are ensuring a legacy in the project with respect to Biosecurity training and promoting biological recording using iNaturalist.
- To raise awareness about biosecurity the project is building on existing local expertise within the BIOTA and US Navy Support Facility Diego Garcia. A new Biosecurity Manual, a compilation of the existing biosecurity materials available for BIOT is being created to be used by new BIOTA Environment Officers. which will contribute to a project legacy of improved biosecurity awareness for BIOT. This manual includes inspection guidance, leaflets for customs staff, surveillance advice for new INNS etc. The BIOTA team already undertake biosecurity training for BIOT customs staff. Through the updated and amended existing biosecurity methodology with BIOTA, this revised guidance is forming a key component of the induction work for customs staff.

4.3 Bahrain and Singapore (and possibly other nations such as Mauritius for rock import) are important entry points, but online training and videos seem insufficient to ensure that these entry points are INNS secure. Consider how you might improve this training to ensure it is effective (HYR)

Linking to the other points of entry has proved challenging for Bahrain and Singapore. We are, however, in touch with the Logistics Support, British Defence Singapore-Support Unit/ Joint Forces Command and have shared training materials with them to increase biosecurity from this point.

4.4 Training will be provided but given both military and BIOT have a high turnover of staff, it is not clear how training will provide a reasonable legacy and increase in capacity unless a continuous training programme is established, nor what training is envisaged for contract civilian staff (HYR);

- See responses to (questions 4.1 and 4.2)

4.5 The logframe could be further improved:

We revisited the logframe to make it more succinct and separated out actions or made clear where it is part of one action. This was approved by NIRAS-LTS.

4.6 Please comment on whether you have sought advice from the BIOT Chief Scientific Advisor, Dr Mark Spalding. Evidence of communication would be welcome

We are in regular touch with Mark Spalding with updates on the project throughout YR2 (FY 2022/2023). This has included meetings on using iNaturalist and the new guides we have produced, sending the survey report that we sent to BIOTA in June 2022 and meetings around biosecurity.

Other queries raised in AR1:

- "AR1 notes that there are 'approximately equal numbers of men and women in the project' although it is not clear what 'in the project' means."

Apologies for not being clear here, by "the project" we meant the main project team delivering tasks on the project and listed in the proposal:

1. BIOT Administration
2. Danielle Frohlich,
3. Rhian Guillem,
4. Nadine Mitschunas,
5. Jodey Peyton,
6. Helen Roy,
7. Elena Tricarico, and
1. Tim Adriaens,
2. Keith Bensusan,
3. Chris Malumphy,
4. James Millett,
5. Ben Price,
6. Wolfgang Rabitsch, and
7. Karsten Schonrogge.

- Dates of samples collected by ZSL were unclear in the AR1.

To confirm, samples were collected from Diego Garcia on the 24th October 2021. Samples were collected from Egmont on the 26th and 27th October 2021.

9. Risk Management

The project developed a risk register in the first 6 months of the project (Annex 3.14 Project Risk Register) through which overall project risk is reviewed regularly. Travel risk was identified in the Risk Register and this remains valid for the final year of work. In addition to overall project risk, we have also created a risk assessment for fieldwork when on Diego Garcia (Annex 3.15 Project Fieldwork Risk Assessment).

10. Other comments on progress not covered elsewhere

The situation over BIOT being a disputed territory has made the communications angle of the project more sensitive. With support from the UKCEH Communications team, we adapted the Communication Plan to reflect that we will not be undertaking opportunistic social media presence on the work but will report on outcomes and highlights through channels such as Blogs and Press Releases that can be approved by all stakeholders. The Project Leader meets with the UKCEH Quality Assurance and Risk Management team monthly to review the project and potential project risks.

11. Sustainability and legacy

The project articles shared by Chagos News and the UKOT Conservation Forum have disseminated the project plans and outputs to a variety of stakeholders, including those across territory (**Activity 5.2**).

The project leader met (online) with both the Outgoing and Incoming Brit Rep on DG to update on the project and review actions and communications for the project. The project leader meets with NGOs working on BIOT each quarter to update on project progress.

We have delivered training to US Navy Support Facility staff on iNaturalist and will be using the training opportunities in the final project trip to build on this initial engagement.

We have trained BIOTA staff in using tools for species identification and species ID.

At this stage in the project, the proposed exit strategy is still considered valid.

12. Darwin Plus identity

The Darwin Logo was also added to the Biosecurity Training Evaluation form (Annex 3.2). The Darwin logo has been added to both the biosecurity leaflet (Annex 3.3) and the miniguides (Annex 3.4) and will be added to all presentations undertaken through the project and in the UKOTCF presentation held on the 7th March 2023 (Annex 3.10). It was also during a lecture to students at the University of Sussex on the 14th February 2023 during a presentation on INNS. On 28 March 2023 UKCEH hosted a meeting with FCDO and Helen Roy presented the project as part of the Biodiversity programme during that visit.

As outlined in Section 11, due to the sensitivities of BIOT being a disputed territory, we will not be taking a conservative approach to social media posting for the project.

13. Safeguarding

The following documents are available on request:

CEH/HR/091: UKCEH SAFEGUARDING POLICY FEB 2023: HD

UKCEH EXTERNAL COMPLAINT PROCEDURE 2020: QT

CEH/HR/090: UKCEH WHISTLEBLOWING POLICY DEC 22: HD

CEH/HR/011: UKCEH CODE OF CONDUCT JUNE 2019: GP

CEH/HR/025: UKCEH DISCIPLINARY PROCEDURE APRIL 2022: HD

Has your Safeguarding Policy been updated in the past 12 months?	Yes
Have any concerns been investigated in the past 12 months	No concerns raised
Does your project have a Safeguarding focal point?	Yes [Helen Doyle ██████████]
Has the focal point attended any formal training in the last 12 months?	Yes/No [If yes, please provide date and details of training] No
What proportion (and number) of project staff have received formal training on Safeguarding?	Past: % [and number] Planned: % [and number] None
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses. NA	

Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify. No

14. Project expenditure

Please expand and complete Table 1. If all receipts have not yet been received, please provide indicative figures and clearly mark them as Draft. The Actual claim form will be taken as the final accounting for funds.

Table 1: Project expenditure during the reporting period (1 April 2022 – 31 March 2023)

Project spend (indicative) in this financial year	2022/23 D+ Grant (£)	2022/23 Total actual D+ Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items				
Others (Please specify)				
TOTAL	£183,714	£180,234.05	£3,479.95	1.9

Table 2: Project mobilising of matched funding during the reporting period (1 April 2022 – 31 March 2023)

	Matched funding secured to date	Total matched funding expected by end of project
Matched funding leveraged by the partners to deliver the project.		

Total additional finance mobilised by new activities building on evidence, best practices and project (£)	

15. OPTIONAL: Outstanding achievements or progress of your project so far (300-400 words maximum). This section may be used for publicity purposes

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

The core mission of the project is to build knowledge of invasive species on Diego Garcia and provide new insights (surveys, pathway analysis) to help design training and design management strategies to minimise or avoid impacts.

Last year, 2022, saw the first comprehensive survey as part of the project targeting invertebrate- and plant species. Standardised sampling protocols were carried out at 31

sites with open and closed canopies in different biomes using direct surveys and different traps. In addition, opportunistic surveys were carried out throughout the island. Identification are in part preliminary, but the survey recorded 229 species of plants, 50 of which were new to Diego Garcia. Notable invasive plants were bluestem grass, *Andropogon tenuispathus*, a fire-promoting grass, and southern sandbur, *Cenchrus echinatus*, which has seed capsules that attach themselves and can irritate and injure seabirds. A third species, river tamarind, *Leucaena leucocephala*, can alter soil chemistry and outcompete more desirable species. Current ranges of the three species are limited on the island and all have been recommended for eradication.

Suction sampling, sweep netting, litter sieving, malaise- and light trapping and hand-collecting/poothering was used to sample 7567 specimens. Preliminary identification records 57 genera in 32 orders. Final identification will be based on morphology where possible and molecular barcoding for a subset. Of particular interests are 25 species of ants all of which are thought to be alien and some have major ecological impacts elsewhere in their range (e.g. *Solenopsis geminata*, *Trychomyrmex destructor*, *Technomyrmex albipes*). Two notorious invaders, however, the yellow crazy ant, *Anoplolepis gracilipes* and the little fire ant, *Wasmannia auropunctata* might be absent considering current search efforts. Other insect orders are likely to include invasives, such as Hemiptera (possibly 9 species) that can be pests and act as vectors for plant disease, will need further identification work.

As part of the programme we interact with a range of stakeholders to create and disseminate material to heighten the awareness of invasives, but also provide management advice from monitoring to control and eradication. Beyond the island based bodies BIOTA environmental officer, Customs, and US Navy base personnel, we also organised a webinar with the UK Overseas Territories Forum on Cane Toad invasiveness and general biology.

File Type (Image / Video / Graphic)	File Name or File Location	Caption, country and credit	Online accounts to be tagged (leave blank if none)	Consent of subjects received (delete as necessary)
Photo	Image 01_Keith Bensusan leaf litter sampling	Keith Bensusan leaf litter sampling credit Jodey Peyton	@alamedagardens @UKCEH	Yes
Photo	Image 02_Wolfgang Rabitsch setting up malaise trap	Wolfgang Rabitsch setting up malaise trap credit Jodey Peyton	@UKCEH	Yes
Photo	Image 03_ Anochetus graeffei,	Anochetus graeffei, worker head credit Albert Gonzalez, Gibraltar Botanic Garden	@alamedagardens @UKCEH	Yes
Photo	Image 04_ Pheidole parva	Pheidole parva, major worker credit Albert Gonzalez, Gibraltar Botanic Garden	@alamedagardens @UKCEH	Yes

Annex 1: Report of progress and achievements against logframe for Financial Year 2022-2023 – if applicable

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
<p>Impact</p> <p>Increased resilience of BIOT's threatened biodiversity and shared biosecurity best-practice methods enables and inspires other remote islands to incorporate invasive non-native species into action and conservation planning</p>		<p>The creation of awareness raising materials for INNS will help prevent arrival and establishment of INNS and thus protect native species. Training materials created and adapted as part of the draft Biosecurity Manual will support the handover of documentation on existing biosecurity for BIOT. The creation of iNaturalist field identification guides and the promotion and use of biological recording tools such as iNaturalist will continue support biological recording throughout the next year.</p>	
<p>Outcome</p> <p>Updated species inventories and maps inform BIOT conservation strategy including capacity building for INNS surveillance and biosecurity, ultimately reducing the rate of INNS introductions and spread to outer islands.</p>	<p>0.1a Data available from species surveys carried out on at least 10 fixed points across DG, identifying presence / absence and abundance of both native and non-native and INNS species by Y3Q2.</p> <p>0.1b Data available to key biosecurity staff on distribution of at least 20 INNS (or potential INNS) on DG linked to possible points of entry, habitats and to risks of spread from DG to outer islands by Y3Q2.</p> <p>0.2 Surveillance protocols for priority INNS are available and incorporated in to BIOTA work plans/ procedures that will be implemented beyond the life of this project by Y3Q2.</p> <p>0.3 At least 20 staff on DG (BIOTA, US Navy Support Facility, military, civilian) demonstrate improved understanding of invasive species management and surveillance Y3Q1.</p> <p>0.4 Species actions plans for at least 2 species of interest agreed with BIOTA and US Navy Support Facility by Y3Q3.</p> <p>0.5 Four popular articles, one scientific paper and 1 conference proceeding include project findings by Y3Q4.</p>	<p>Almost 700 iNaturalist records are already openly available from the second year of the project. In addition, the UKCEH database holds data on more than 7,500 specimens collected from Diego Garcia through opportunistic and standardised sampling (Annex 3.1 gives a map of the sites) from the UKCEH and ZSL-BIOTA trips. These specimens are with experts at the Gibraltar Botanic Garden, the Natural History Museum and Fera. (Indicator 0.1a and MoV 0.1a and 0.1b) (Activity 1.3).</p> <p>Data from the June 2022 trip (Activity 1.3) was made available to BIOTA, ZSL and the US Navy Support Facility (Indicator 0.1a).</p> <p>Plant and ant survey protocols were shared with US Navy Support Facility staff and BIOTA Environment Officer during the June 2022 trip (Indicator 0.2).</p> <p>iNaturalist training given to US Navy Support Facility staff to support opportunistic recording from DG (Output 2).</p> <p>Thirty-four staff on DG received biosecurity training using guidance and presentations updated throughout the project since September 2021 (Indicator 0.3).</p>	<p>The main activities for 2023/2024 are the field trip (Indicator 0.1), continued species level identification by experts DNA barcoding and biosecurity "Train the Trainer" training. Finally, review with BIOTA will confirm the drafting of species management plans (Indicator 0.4).</p>

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
		<p>Evaluation forms have been drafted as part of Output 2 and Output 3 (Indicator 2.1, Indicator 3.2).</p> <p>0.5 – complete - 4 popular articles have been drafted and shared (Indicator 0.5, Indicator 5.2). One conference presentation on the results of the project to date (7th March 2023) Indicator 5.3.</p>	
<p>Output 1 Native and non-native species inventory and distribution maps produced for amphibians, reptiles, invertebrates and plants WP1-4.</p>	<p>1.1 Database holds data from invertebrate sampling and plant surveys from 10+ locations by Y2Q1 and Y3Q1.</p> <p>1.2 Database holds data from repeat amphibian and reptile surveys (following 2013 military baseline survey) by Y3Q2.</p> <p>1.3 Database holds data from samples collected by BIOTA and shipped to UK by Y3Q1.</p> <p>1.4 Database holds data from at least 50 ant samples by Y3Q1.</p> <p>1.5 Database holds data from UKCEH/EAA processing of all (plant and non-ant invertebrate) by Y3Q1.</p> <p>1.6 Database holds DNA bar-coding data on 150 invertebrate samples samples by Y3Q2.</p> <p>1.7 Species distribution maps available by Y3Q2.</p> <p>1.8 "Heat maps" with potential INNS risk areas available by Y3Q2.</p>	<p>This Output has started well and will continue in the final year of the project 2023/2024.</p> <p>Indicator 1.1: The UKCEH database holds information on over 7,500 specimens, collected from 31 standardised sampling sites (open canopy and closed canopy sites), as well as from opportunistic sampling. Further sampling will be undertaken in FY 2023/2024, but with a stronger focus on supplementing the iNaturalist database.</p> <p>Indicator 1.2: This was postponed due to flight delays, until the fieldwork trip in FY2023/2024</p> <p>Indicator 1.3: The UKCEH database holds information on samples collected by BIOTA and ZSL. The iNaturalist site also contains records submitted by ZSL and BIOTA and the US Navy Support PWD.</p> <p>Indicator 1.4: The UKCEH database holds information on over 2,500 ants surveyed in Year 2 of the project.</p> <p>All species-level invertebrate and plant records will be added to Open Access platforms at the end of the project</p> <p>Indicator 1.5: Database holds information on over 7,500 specimen records sorted to species level (where possible), and genus or higher taxon level (if not) by Gibraltar Botanic Gardens, UKCEH, EAA, Fera and the Oxford Natural History Museum. Samples are now with the NHM for further identification.</p> <p>Indicator 1.6: Many samples (>150) already in hand and lab work will commence in April 2023 and be finished by end July 2023. The next batch will be done as soon as delivered to NHM.</p> <p>Indicator 1.7 and Indicator 1.8 will be completed in the final year of the project.</p>	
<p>Activity 1.1a Survey planning and consultation throughout with BIOTA and BIOT Environmental Teams in selecting location of at least 10 sampling sites</p>		<p>The project team compiled a list of 16 sites (8 in pairs and submitted it for the June 2022 Expedition to BIOTA. The list was approved in January 2022.</p>	<p>This activity is now complete.</p>
<p>Activity 1.1b Undertake invertebrate and plant surveys at these sites across DG, during two visits.</p>		<p>Equipment for these surveys was purchased in the financial year 2021/2022 including the purchase of items from Singapore which were shipped to DG in March 2022. In Year 2, Activity</p>	<p>The second of the two visits will take place in FY 2023/2024. This will comprise further opportunistic sampling and an increased focus on making iNaturalist</p>

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
		<p>1.1b continued to go well with physical samples collected and online records submitted from 31 locations, in addition to further opportunistic sampling. The database contains information on over 7,500 specimens. Over 4,300 of these are ants, the majority of which are identified to species. These records extend the data already collected by BIOTA and ZSL. Identification is ongoing, but several new records of species previously not recorded from DG are to be expected. The iNaturalist site includes over 150 records collected by the US Navy Support Facility.</p> <p>Over the course of the three weeks of systematic and opportunistic botanical surveys, two hundred and twenty-nine plant species were recorded. Over 50 new records of plants, previously not recorded from Diego Garcia, were added to the existing Kew plant species list.</p>	<p>records to support the global biological recording community and in particular, regional ecologists/taxonomists who will be able to access the photo records.</p>
Activity 1.2 Undertake 20 amphibian and reptile surveys (following existing protocols), during one visit.		NA	These were not undertaken in year 2 due to severe flight delays in Bahrain and will form part of the final year fieldwork trip
Activity 1.3 At least two supplementary invertebrate sampling undertake by BIOTA in between main fieldwork trips (see Output 2). Maintain regular (bi-monthly updates with BIOT staff to review surveys) as well as at quarterly updates.		Samples were collected by BIOTA and ZSL from Diego Garcia on the 24th October 2021. Samples were collected from Egmont on the 26th and 27th October 2021. These samples were identified by Fera (see Annex 3.6). Additional records have been added to the iNaturalist site by ZSL, BIOTA and the US Navy Support Facility and project team.	<p>We expect that further samples will be added to the iNaturalist site by the BIOTA, US Navy Support Facility and ZSL in the forthcoming year.</p> <p>Regular email contact is maintained with the BIOTA and regular meetings held.</p>
Activity 1.4 GBG identify ant material from visits and through subsequent surveys from BIOTA (see 1.3), increasing their reference collection and serving as knowledge centre on non-native ants for the other UKOTs.		More details are available in the main text, but the GBG team have processed over 2,740 ant samples from the trip, and are organising photographs of the specimens to support future identifications	Ant samples will be photographed and selected specimen will undergo molecular fingerprinting in FY 2023/2024 using the mitochondrial barcode gene COI (Activity 1.6).
Activity 1.5 UKCEH process and identify invertebrate material to morphospecies.		More details are given in the main text but over 7,500 specimens (Annex 3.5b) sorted in the lab, for at least 32 orders collected with almost 60 genera and approximately 45 species recorded to date. This is in addition to the records on iNaturalist. We have made new records of groups	Further invertebrate processing will be undertaken on the 2023 field trip samples. Molecular barcoding for selected species will be undertaken by the NHM in Year 3 (Activity 1.6).

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
		<p>that have not yet been recorded from Diego Garcia, although final identification is still pending. The OUNHM have identified 30+ morphospecies of spiders. We anticipate that we have found all three endemic Orthoptera species and one species of pygmy mole crickets (Tridactylidae), another group not yet known from Diego Garcia. More than 250 samples/observations of scale insects and related groups (aphids, whiteflies and psyllids) were recorded in Diego Garcia on 45+ plant species. An estimated 20 species of scale insect have been recorded of which 12 appear to be new for BIOT; 4 species of whitefly have been recorded of which 3 appear to be new to the island.</p>	
Activity 1.6a The project team undertakes species level identification.		This work is ongoing but through the database and iNaturalist we have collected approximately 45 species records to date from the lab samples.	Additional identification will be undertaken in FY 2023/2024 and samples processed over the summer/autumn 2023
Activity 1.6b NHM undertakes the DNA barcoding on at least 150 invertebrate samples.		NA	Many samples (>150) already in hand and lab work will commence in April 2023 and be finished by end July 2023. The next batch will be done as soon as delivered to NHM.
Activity 1.7 Species distribution maps are generated from survey data (see 1.1 to 1.3) with GIS software.		NA	This work will be undertaken in the FY 2023/24.
Activity 1.8 "Heat maps" of any INNS records of potential concern are produced using data from 1.7.		NA	This work will be undertaken in the FY 2023/24.
<p>Output 2 Species survey training delivered to BIOTA staff and research outputs shared with at least ten multidiscipline staff on DG. WP3, 4 and 5.</p>	<p>2.1 BIOTA Environment staff trained in species-specific survey methods Y2Q1 and repeated in Y3Q1.</p> <p>2.2 Invasive ant awareness and identification video available by Y3Q4.</p> <p>2.3 FSC "miniguide" created by Y2Q1.</p> <p>2.4 At least two survey feedback meetings held with BIOTA and US Navy Support Facility documented by Y3Q1.</p>	<p>This output is partially completed.</p> <p>Indicator 2.1: Complete for the first year with survey methods and identification training given to BIOTA Environmental Officer and the US Navy Support Facility PWD staff member.</p> <p>Indicator 2.2: Video created and draft shared (Annex 3.7).</p> <p>Indicator 2.3: Complete</p> <p>Indicator 2.4: Complete for the first year of fieldwork: Meetings were held with the US Navy Support Facility and the BIOTA Environment Officer following the completion of fieldwork in July 2022. Regular email communication is maintained with the BIOTA and US Navy Support Facility staff.</p>	

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
	2.5 Full species inventory available for identified species by Y3Q4.	Indicator 2.5: Current inventories available on UKCEH Teams site and iNaturalist – further records and identifications will be added in FY 2023/2024	
Activity 2.1 BIOTA trained in range of invertebrate surveying methods as part of delivery of Output 1. The team will design and distribute feedback questionnaires as part of M&E.		<p>Species identification training on plants and invertebrates was given to the BIOTA Environmental Officer and the US Navy Support Facility staff PWD member based on the island with responsibility for environmental monitoring. The US Navy Support Facility PWD staff member intends to undertake ant baiting at key points of potential introductions (port, airport and downtown) to support the Early Warning Rapid Response (EWRR) on Diego Garcia for target ant species, such as the little fire ant (<i>Wasmannia auropunctata</i>).</p> <p>Although not part of the LogFrame, we took the opportunity to share training in use of iNaturalist (further tips for use) with US Navy Support Facility Staff in March 2022.</p>	Further training and iNaturalist support will be offered to teams on Diego Garcia during the 2023 trip.
Activity 2.2 Ant awareness raising- and identification video created by GBG.		<p>This activity is almost complete, the videos are created and drafts shared with BIOTA Environment Officer (Annex 3.7). In addition to this video, photos and short clips and descriptions of ants from Diego Garcia, as well as ants from other UKOTs have been added to the Ants of the UKOTs Facebook page https://www.facebook.com/people/Ants-of-the-UK-Overseas-Territories/100090289091315/.</p>	Further promotion of the ant presentation will be undertaken in FY 2023/2024.
Activity 2.3 Develop (Field Studies Council) beginner ID guide (Fig. 2 Additional materials) for key species of interest for military and civilian personnel on DG in several languages.		<p>FSC miniguide to INNS of concern from the Horizon Scanning work of Roy et al. (2019) created (Annex 3.4). In addition to these miniguides, 20 iNaturalist guides have been created to support field identification of species going forward e.g. Annex 3.8. These can be found here, alongside guides created by Kew: https://www.inaturalist.org/guides/search?utf8=%E2%9C%93&q=british+indian+ocean+territory&commit=Search</p>	This activity is now complete.

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
Activity 2.4 Meeting held with BIOTA and BIOT Environmental Teams at the end of fieldwork trips to summarise findings.		Complete for the first year of fieldwork: Meetings were held with the US Navy Support Facility and the BIOTA Environment Officer following the completion of fieldwork in July 2022. Regular email communication is maintained with the BIOTA and US Navy Support Facility staff.	This will be repeated after the FY 2023/2024 trip
Activity 2.5 Full detailed species inventory shared with BIOTA and BIOT Environmental Teams and made available via Open Access Platform e.g. GBIF at end of project.		Species identified to date have been shared with BIOTA, ZSL and the US Navy Support Facility.	The main part of this work will be undertaken after the June 2022 trip and the 2023 trip where species information is available
Output 3 At least 20 military and civilian staff on DG have improved knowledge of Biosecurity protocols and surveillance WP5.	<p>3.1 A Communication Plan identifying how outputs will be disseminated and embedded into the main responsible institutions on BIOT and in third countries (on pathways) by Y1Q4.</p> <p>3.2 Biosecurity surveys taken by at least 20 trained staff demonstrate improvement in skills compared to baseline survey (Baseline to be established by Y3Q 4).</p> <p>3.3 Pathway Action Plans available to support biosecurity recommendations for BIOTA, US Navy Support Facility and military by Y3Q4.</p> <p>3.4 "Train the trainer" event for Biosecurity and INNS awareness delivered to at least 5 US Navy Support Facility members by GBNNSS and wider project team completed and reported by Y3Q4.</p>	<p>This Output is progressing well.</p> <p>Indicator 3.1: Complete – the Communication Plan is a live document to be reviewed and edited as needed.</p> <p>Indicator 3.2: Complete - BIOTA and the US Navy Support Facility have delivered training to 34 people since September 2021. Feedback questionnaires have been created (Activity 3.2) (Annex 3.2), but have not as yet been given to trained staff. Thirty-four staff have been trained to date.</p> <p>Indicator 3.3: Complete - the Pathway Action Plans developed in 2018 were reviewed during the June 2022 trip and considered still suitable for assessing risk. In addition, a Pathway Analysis was undertaken for ants and shared with BIOTA through the Biosecurity Manual (Annex 3.9).</p> <p>Indicator 3.4: This indicator has yet to be complete due to the delays to the June 2022 trip. Further work will be undertaken in FY 2023/2024.</p>	
Activity 3.1 Draft communication plan and updated Pathway Action Plan including analysis of existing biosecurity measures on DG with US Navy Support Facility (and Bahrain and Singapore if possible) with military and civilian personnel.		Complete - the Communication Plan has been drafted, outlining key stakeholders and messages for the project. This is a live document and will be reviewed regularly throughout the project. The Pathway Action Plan review was undertaken during the extended stay in Bahrain in June 2022 with the GB Non-Native Species Secretariat and BIOTA. An additional Pathway Analysis was undertaken for ants during this same time (Annex 3.9).	This Communication Plan will be revisited throughout the project to review for updates.

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
Activity 3.2 Design and distribute questionnaires as part of M&E. Findings used to create set of practical actions for US Navy Support Facility and biosecurity staff (e.g. customs) which can be undertaken on DG at potential points of introduction / points of exit for outer islands.		BIOTA and the US Navy Support Facility have delivered training to 34 people since September 2021. Feedback questionnaires have been created (Activity 3.2) but to date not used. Evaluation forms for Biosecurity training prepared as part of BIOTA biosecurity training and induction (Annex 3.2).	Complete but during any additional biosecurity training in FY 2023/2024 these forms will be distributed.
Activity 3.3 Review and update Pathway Action Plans and compile with biosecurity material guidance		Linked to Activity 3.1. Biosecurity guidance materials, in the form of updated checklists, identification guides and training videos, packaged in a draft Biosecurity Manual have been created and shared with BIOTA for provision of future training.	Complete
Activity 3.4 Work with US Navy Support Facility to design and deliver INNS awareness raising and biosecurity training for civilian staff on DG (train the trainers), based on data from 3.1-3.3; design and distribute questionnaires as part of M&E. Measure changes in understanding of INNS awareness and biosecurity with staff through questionnaires (based on 3.1 and 3.2 surveys)		"Train the trainer" training delayed due to the June 2022 delayed trip but see 3.1. The US Navy Support Facility from Hawai'i delivered training to 13 contract personnel. UKCEH has maintained regular contact with the US Navy Support Facility in Hawai'i through 2022/23 and will continue this knowledge-exchange throughout 2023/24.	This Activity will be undertaken in FY 2023/2024 with the GB Non-Native Species Secretariat, BIOTA and US Navy Support Facility PWD.
Output 4 Species action plans created for at least two species, based upon stakeholder consultation. WP6	<p>4.1 The identification of at least 2 species of interest/concern for management or conservation action plans by Y3Q1</p> <p>4.2 Draft management plans for at least 2 species of interest / concern available by Y3Q2.</p> <p>4.3 Peer reviewed Management plans available by Y3Q3.</p>	<p>This Output will be taking place in the final year of the project, with activities from Outputs 1-3 contributing to delivery.</p> <p>Indicator 4.1: Partially complete. Eight plants were identified during the June 2023 trip as being of potential suitability to either manage the further spread or eradicate. In addition, one ant species <i>Trichomyrmex destructor</i> has been identified for management given its apparent limited distribution and cane toads were identified as a species to consider for assessing eradication feasibility.</p> <p>Indicator 4.2: Guidance for plant and ant management was shared with the BIOTA Environment Officer.</p> <p>Indicator 4.2: Final plans to be confirmed in FY 2023/2024.</p>	
Activity 4.1 Year 1 and 2 fieldwork data (Output 1) used as a starting point to identify key species of interest / concern for management or conservation priorities during Year 2 field work wash up meeting (part of Output 2.4).		Following the fieldwork of June 2022, 8 plants and one species of ant were identified as being of potential suitability to either manage the further spread or eradicate; cane toads were identified as a species to consider for assessing eradication feasibility which will be further assessed in the Year 2 field work	Ongoing

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
Activity 4.2 Data and materials / outcomes of meetings from Output 1, 2 and 3 used to draft species management or conservation actions plans for species of interest / concern on DG. Work led by BIOTA with input from wider team.		Outline management and eradication plans for the 8 plants and one ant species were shared with BIOTA in July 2022.	
Activity 4.3 Management and / or conservation action plans finalised.		Partially completed with Activity 4.2	For 2023/2024
Output 5 Research outputs shared with scientific and INNS practitioner audience.	<p>5.1 Project brief downloaded from BIOTA website at least 20 times by Y3Q4.</p> <p>5.2 At least 4 lay articles published by Y3Q4.</p> <p>5.3 Publication of scientific results at international conference proceeding (oral or poster) by Y3Q4.</p> <p>5.4 One Journal article on INNS on DG submitted to Open Access journal by Y3Q3.</p>	<p>Progress towards achieving this output has started and is progressing well.</p> <p>Indicator 5.1: Project brief shared with the BIOTA; however, the website is being redesigned and as such the Project Brief is not yet shared on the site.</p> <p>Indicator 5.2: This indicator is complete with four articles being published (see Activity 5.2 for more information).</p> <p>Indicator 5.3: This indicator is complete with the project results to date being shared at the UKOTCF Conference on Invasive Species (Annex 3.10). Further opportunities for sharing results will be taken in the final project year.</p> <p>Indicator 5.4: A draft article has been written on the Hemiptera of BIOT and will be submitted to a journal following the results of the 2023 field trip. Further publications are being considered.</p>	
Activity 5.1 Project brief created and added to BIOTA website.		The project brief has been drafted and shared with BIOTA for addition to their website. This will be added to the new website when available.	The number of downloads will be monitored once available on new website.
Activity 5.2 Popular articles on project outputs were written for relevant organisations for sharing updates on project outputs (e.g. UKOTCF newsletter, Darwin Newsletter and MoD Sanctuary magazine).		This activity is complete with four articles on the project published: three in Chagos News https://chagos-trust.org/images/uploads/documents/Chagos_News_59.pdf https://chagos-trust.org/news/the-latest-issue-of-chagos-news-is-out-now and one for UKOT Conservation Forum Newsletter https://www.ukotcf.org.uk/forum-news-55-published/ - shared with 314 subscribers). In addition to these articles, the project team were invited to draft a book chapter for the SRT for a UKOTCF book.	Further opportunities for publications will be sought in FY 2023/2024.
Activity 5.3 Presentation of scientific results at international conferences (oral or poster).		The results of the project to date were reported at the UKOTCF Invasive species Conference on the 7 th March 2023.	
Activity 5.4 Journal article on INNS on DG submitted to open access journal.		NA	A draft article has been written on the Hemiptera of BIOT and will be submitted

Project summary	SMART Indicators	Progress and Achievements April 2022 - March 2023	Actions required/planned for next period
			to a journal following the results of the 2023 field trip. Further publications are being considered.

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

Project Summary	Measurable Indicators	Means of Verification	Important Assumptions
Impact: (Max 30 words) Increased resilience of BIOT's threatened biodiversity and shared biosecurity best-practice methods enables and inspires other remote islands to incorporate invasive non-native species into action and conservation planning			
Outcome (Max 30 words) Updated species inventories and maps inform BIOT conservation strategy including capacity building for INNS surveillance and biosecurity, ultimately reducing the rate of INNS introductions and spread to outer islands.	0.1a Data available from species surveys carried out on at least 10 fixed points across DG, identifying presence / absence and abundance of both native and non-native and INNS species by Y3Q2.	0.1a Project Teams site holds amphibian, reptile, invertebrate and plant species survey methods and data for work undertaken on DG available	Major field activities are not cancelled due to COVID-19 restrictions. Species surveys accurately identify both native and INNS present on DG. Information on native and INNS occurrence and distribution usefully informs Environmental Teams on DG and enables them to address potential threats of INNS. Organisation in / on pathways BIOT have capacity to engage with the work.
	0.1b Data available to key biosecurity staff on distribution of at least 20 INNS (or potential INNS) on DG linked to possible points of entry, habitats and to risks of spread from DG to outer islands by Y3Q2.	0.1b Project Teams site holds spatial information on key species.	
	0.2 Surveillance protocols for priority IAS are available and incorporated in to BIOTA work plans/ procedures that will be implemented beyond the life of this project by Y3Q2.	0.2 BIOTA work plans (staff work plans, organisational work plans and budgets)	
	0.3 At least 20 staff on DG (BIOTA, US Navy Support Facility, military, civilian) demonstrate improved understanding of invasive species management and surveillance Y3Q1.	0.3 A report on training including information from a baseline survey on background knowledge of INNS and post training assessment of knowledge.	
	0.4 Species actions plans for at least 2 species of interest agreed with BIOTA and US Navy Support Facility by Y3Q3.	0.4 Species action plans on BIOTA website.	
	0.5 Four popular articles, one scientific paper and 1 conference proceeding include project findings by Y3Q4.	0.5 Four popular articles, one scientific paper and 1 conference proceeding documented in annual reports.	

Outputs: 1. Native and non-native species inventory and distribution maps produced for amphibians, reptiles, invertebrates and plants WP1-4.	1.1 Database holds data from invertebrate sampling and plant surveys from 10+ locations by Y2Q1 and Y3Q1.	1.1 Copy of central database and summary of data available on project TEAMs site.	Major field activities are not cancelled due to COVID-19 restrictions. Organisations in BIOT have capacity to engage with work. Identifying to species to family-level will not prevent development of protocols, where species-level identification is not possible.
	1.2 Database holds data from repeat amphibian and reptile surveys (following 2013 military baseline survey) by Y2Q1 and Y3Q1.	1.2 Copy of central database and summary of data available on project Teams site. <u>UPDATE</u> : amphibian and reptile surveys postponed to 2023 due to travel disruption in 2022.	
	1.3 Database holds data from samples collected by BIOTA and shipped to UK by Y3Q1.	1.3 Copy of central database and summary of data available on project TEAMs site.	
	1.4 Database holds data from at least 50 ant samples by Y3Q1.	1.4 Copy of central database and summary of data available on project TEAMs site.	
	1.5 Database holds data from UKCEH/EAA processing of all (plant and non-ant invertebrate) by Y3Q1.	1.5 Copy of central database and summary of data available on project Teams site.	
	1.6 Database holds DNA bar-coding data on 150 invertebrate samples by Y3Q2.	1.6 DNA barcoding data on into BOLD database	
	1.7 Species distribution maps available by Y3Q2.	1.7 Project TEAMs site, final report and management / action plans.	
	1.8 "Heat maps" with potential INNS risk areas available by Y3Q2.	1.8 Project Teams site, final report and management action plans.	
2. Species survey training delivered to BIOTA staff and research outputs shared with at least ten multidiscipline staff on DG. WP3,4 and 5.	2.1 BIOTA Environment staff trained in species-specific survey methods Y2Q1 and repeated in Y3Q1.	2.1 Evaluation forms, email updates	Major field activities are not cancelled due to COVID-19 restrictions. Organisations in BIOT have capacity to engage with work.
	2.2 Invasive ant awareness and identification video available by Y3Q4.	2.2 Video in training syllabus (training log); Chagos information portal and on UKOTCF website	

	2.3 FSC “miniguide” created by Y2Q1.	2.3 FSC miniguide video in training syllabus (training log) Chagos information portal and on shared UKOTCF website.	Partnering organisations have capacity to share / disseminate project information. Validated data is of sufficient quality to be shared on Open Access Platform.
	2.4 At least two survey feedback meetings held with BIOTA and US Navy Support Facility documented by Y3Q1.	2.4 Teams site and HYR and AR.	
	2.5 Full species inventory available for identified species by Y3Q4.	2.5 Project Teams site and Open Access platform e.g. GBIF and signposted through the Chagos Information Portal.	
3. At least 20 military and civilian staff on DG have improved knowledge of Biosecurity protocols and surveillance WP5.	3.1 A Communication Plan identifying how outputs will be disseminated and embedded into the main responsible institutions on BIOT and in third countries (on pathways) by Y1Q4.	3.1 Communication Plan available for team on project Teams due to sensitivities in stakeholders.	Major field activities are not cancelled due to COVID-19 restrictions. Organisations in BIOT and in third countries (on pathways) have capacity to engage with work.
	3.2 Biosecurity surveys taken by at least 20 trained staff demonstrate improvement in skills compared to baseline survey (Baseline to be established by Y3Q4).	3.2 Survey report shared with BIOTA and US Navy Support Facility Environment staff.	
	3.3 Pathway Action Plans available to support biosecurity recommendations for BIOTA, US Navy Support Facility and military by Y3Q4.	3.3 Project Teams site; biosecurity action plan part of training syllabus (3.4).	
	3.4 “Train the trainer” event for Biosecurity and INNS awareness delivered to at least 5 US Navy Support Facility members by GBNSS and wider project team completed and reported by Y3Q4.	3.4 Project Teams site; Staff training log created	
4. Species action plans created for at least two species, based upon stakeholder consultation. WP6	4.1 The identification of at least 2 species of interest/concern for management or conservation action plans by Y3Q1	4.1 Documentation shared on project Teams site.	Data is available from complementary cross-organisational surveys, to inform decision making for conservation or management priorities. Species of interest / concern are identified where clear management actions can be identified and incorporated in to plans
	4.2 Draft management plans for at least 2 species of interest / concern available by Y3Q2.	4.2 Draft document on Teams site	
	4.3 Peer reviewed Management plans available by Y3Q3.	4.3 Finalised Documents on BIOTA website.	
5. Research outputs shared with wider scientific and INNS practitioner audience	5.1 Project brief downloaded from BIOTA website at least 20 times by Y3Q4.	5.1 Download metrics (Google analytics) are recorded and summary statistics reported through HYR and ARs	Findings are of interest to wider scientific community and INNS practitioners.
	5.2 At least 4 lay articles published by Y3Q4.	5.2 Articles published and summary information reported through HYR and ARs.	

	5.3 Publication of scientific results at international conference proceeding (oral or poster) by Y3Q4.	5.3 Conference proceedings and reported through HYR and AR.	
	5.4 One Journal article on INNS on DG submitted to Open Access journal by Y3Q3.	5.4 Journal confirmation email; draft article.	

Measurable Indicators	Means of Verification	What needs to be monitored / evaluated?	Methods for data collection	Sampling (who/what will be included? How many?)	Timing (when and how often is information required?)	Budget (total 1.1-5.3 = 63 days)
0.1a Data available from species surveys carried out on at least 10 fixed points across DG, identifying presence / absence and abundance of both native and non-native and INNS species by Y3Q2.	0.1a Project Teams site holds amphibian, reptile, invertebrate and plant species survey methods and data for work undertaken on DG available	Number of locations; species identification data; how data will be used to inform biosecurity.	Review of databases; maps on Teams site.	Project leader and work package leads.	At least every quarter, more often during key survey times, to final project meeting.	5 days
0.1b Data available to key biosecurity staff on distribution of at least 20 INNS (or potential INNS) on DG linked to possible points of entry, habitats and to risks of spread from DG to outer islands by Y3Q2.	0.1b Project Teams site holds spatial information on key species.					
0.2 Surveillance protocols for priority IAS are available and incorporated in to BIOTA work plans/ procedures that will be implemented beyond the life of this project by Y3Q2.	0.2 BIOTA work plans (staff work plans, organisational work plans and budgets)	The existence of surveillance protocols, co-authored by wider project team; results of feedback questionnaires on training added to reports; evidence of commitment of staff for further surveillance.	Review of documents on Teams site; review of details of reports.	Project leader and work package leads.	By Y2Q1 and reviewed throughout project to final project meeting.	1 day
0.3 At least 50 staff on DG (BIOTA, US Naval Facility, military, civilian) demonstrate improved understanding of invasive species management and surveillance Y3Q1.	0.3 A report on training including information from a baseline survey on background knowledge of INNS and post training assessment of knowledge.	The existence of training plans, co-authored by wider project team; results of feedback questionnaires on training added to reports; evidence of commitment of staff for further biosecurity training.	Review of documents on Teams site; review of details of reports.	Project leader, work package leads and US Naval Facility.	By Y2Q2 and reviewed throughout project to final project meeting.	3 days

0.4 Species actions plans for at least 2 species of interest agreed with BIOTA and US Naval Facility by Y3Q3.	0.4 Species action plans on BIOTA website.	Meeting minutes with actions on drafting plans; the existence of draft and final conservation and management plans, co-authored by wider project team and signed off by BIOTA.	Review of documents on Teams site; review of details of reports.	Project leader, work package leads and US Naval Facility.	By project end, Y3Q4.	14 days
0.5 Four popular articles, one scientific paper and 1 conference proceeding include project findings by Y3Q4.	0.5 Four popular articles, one scientific paper and 1 conference proceeding documented in annual reports.	Evidence of creation of articles, papers and project within conference proceedings.	Search of organisational websites; conference proceedings.	Project leaders	Throughout project but by Y3Q4.	17 days
1.1 Database holds data from invertebrate sampling and plant surveys from 10+ locations by Y2Q1 and Y3Q1.	1.1 Copy of central database and summary of data available on project Teams site.	Sampling locations, georeferenced survey data.	Range of invertebrate sampling methods e.g. Pitfall trap, light traps; Reviewing data on Teams site.	UKCEH, SCWA, FERA, EAA. Data on all species collected on DG with associated metadata (e.g. date sampled from field, collection methods etc.); results shared with wider team for review.	Twice, Y2Q1 and Y3Q1 (Dates given throughout the M&E are COVID-19 dependent). Feedback reported during quarterly steering group meetings.	2 days
1.2 Database holds data from repeat amphibian and reptile surveys (following 2013 military baseline survey) by Y2Q1 and Y3Q1.	1.2 Copy of central database and summary of data available on project Teams site	Sampling locations, georeferenced survey data.	Amphibian and reptile surveys follow US Naval surveys; Reviewing data on Teams site.	INBO, ET. Data on all species recorded during surveys on DG with associated metadata (e.g. date of survey, surveyor, weather conditions, methods etc.); results shared with wider team for review.	Twice, Y2Q1 and Y3Q1.	1 day
1.3 Database holds data from samples collected by BIOTA and shipped to UK by Y3Q1.	1.3 Copy of central database and summary of data available on project Teams site.	Sampling locations, georeferenced survey data.	Range of invertebrate sampling methods e.g. Pitfall trap, light traps.	BIOTA. Data on all species collected on DG with associated metadata (e.g. date sampled from field, collection methods	Surveys undertaken quarterly, between Y2Q1 and Y3Q1. Feedback reported during quarterly	1 day

				etc.); results shared with wider team for review.	steering group meetings.	
1.4 Database holds data from at least 50 ant samples by Y3Q1.	1.4 Copy of central database and summary of data available on project Teams site.	Number of ant samples collected and identified.	Methods include bait traps.	GBG and BIOTA; Data on all species collected on DG with associated metadata (e.g. date sampled from field, collection methods etc.); results shared with wider team for review.	Surveys undertaken monthly, between Y2Q1 and Y3Q1. Feedback reported during quarterly steering group meetings.	1 day
1.5 Database holds data from UKCEH/EAA processing of all (plant and non-ant invertebrate) by Y3Q1.	1.5 Copy of central database and summary of data available on project Teams site.	Number of invertebrate samples collected and identified.	Microscopy and taxonomic keys	UKCEH, EAA; results shared with wider team for review.	Twice, Y2Q1 and Y3Q1.	1 day
1.6 Database holds DNA bar-coding data on 150 invertebrate samples by Y3Q2.	1.6 DNA barcoding data onto BOLD database	Number of invertebrate samples identified and number of DNA barcodes sequenced.	Microscopy, taxonomic keys, "DNA barcoding" analysis using standard gene regions on 150 identified species, and submit data to the open access BOLD DNA barcode database.	UKCEH, EAA, NHM; results shared with wider team for review.	Once, Y3Q2.	1 day
1.7 Species distribution maps available by Y3Q2.	1.7 Project Teams site, final report and management / action plans.	Creation of species distribution maps	Review of documents on Teams site.	UKCEH analyse species data; shared with wider team for review.	Once, Y3Q2.	1 day
1.8 "Heat maps" with potential INNS risk areas available by Y3Q2.	1.8 Project Teams site, final report and management action plans.	Creation of "Heat maps"	Review of documents on Teams site.	UKCEH analyse species data; shared with wider team for review.	Once, Y3Q2.	1 day

2.1 At least 2 BIOTA staff trained in species-specific survey methods Y2Q1 and repeated in Y3Q1.	2.1 Staff training log	Number of staff trained; staff training log inc. date of training, next steps etc,	Short summary statement of numbers of staff involved, alongside training log	At least 2 members of BIOTA trained by WP1-4 leads.	Twice, Y2Q1 and Y3Q1. Feedback reported during quarterly steering group meetings.	2 days
2.2 Invasive ant awareness and identification video available by Y2Q1.	2.2 Video in training syllabus (training log); Chagos information portal and on UKOTCF website	The creation of an ant awareness and identification video.	Review of video to ensure includes messages on INNS and key "Tramp" ant species	GBG create video, project team review	Once, Y2Q1.	1 day
2.3 FSC "miniguide" created by Y2Q1.	2.3 FSC miniguide video in training syllabus (training log) Chagos information portal and on shared UKOTCF website.	If the FSC guide was co-designed and produced.	Review of guide to ensure includes messages on INNS.	Project leader, work package leads and US Naval Facility all involved in creating guides.	Once, Y2Q1.	1 day
2.4 At least two survey feedback meetings held with BIOTA and US Naval Facility documented by Y3Q1.	2.4 Teams site and HYR and AR.	Dates the meetings took place, who attended, what materials were created for meeting and shared after meeting	Reviewing attendance list in meeting minutes	Project Team on DG	Twice, Y2Q1 and Y3Q1.	2 days
2.5 Full species inventory available by Y3Q4.	2.5 Project Teams site and Open Access platform e.g. GBIF and signposted through the Chagos Information Portal.	The presence of a full species inventory on an Open Access platform e.g. GBIF and the Chagos Information Portal.	Searches on both websites.	Data on all species collected on DG with associated metadata (e.g. date sampled from field, identifier etc.)	c	2 days
3.1 A Communication Plan identifying how outputs will be disseminated and embedded into the main responsible institutions on BIOT and in third countries (on pathways) by Y1Q1.	3.1 Communication Plan posted on project teams website.	Presence of a communication plan on the project Teams website	Review of documents on Teams site.	UKCEH will lead writing plan with contributions / edits to writing the plan from wider project team.	Twice, Y2Q1 and Y3Q1. Feedback reported during quarterly steering group meetings.	4 days
3.2 Biosecurity surveys taken by at least 50 trained staff demonstrate improvement in skills compared to baseline survey (Baseline to be established Y2Q1 with repeat survey carried out Y3Q1).	3.2 Survey report posted on project teams website.	Number of staff surveyed; staff training log, dates the training took place, who attended, what materials were created for meeting and shared after meeting.	Reviewing attendance list in short training summary report.	US Naval Facility; GBNNSS and work package leads will contribute to writing plan.	Twice, Y2Q1 and Y3Q1.	3 days
3.3 Pathway Action Plans available to support biosecurity recommendations for BIOTA, US Naval Facility and military by Y2Q1.	3.2 Project Teams site; biosecurity action plan part of training syllabus (3.4).	Presence of updated pathway action plan on	Review of documents on Teams site.	US Naval Facility, BIOTA, GBNNSS and work package	Once by Y2Q1.	4 days

		the project Teams website		leads will update the pathway actions plan.		
3.4 "Train the trainer" event for Biosecurity and INNS awareness delivered to at least 5 US Naval Facility members by GBNNSS and wider project team completed and reported by Y2Q1.	3.4 Project Teams site; Staff training log created	Number of staff trained; staff training log, dates the training took place, who attended, what materials were created for meeting and shared after meeting, number of additional staff trained	Reviewing attendance list in short training summary report.	US Naval Facility, BIOTA and military and civilian personnel; BIOTA, US Naval Facility, project leaders and GBNNSS review changes.	Twice, Y2Q1 and Y3Q1.	3 days
4.1 The identification of at least 2 species of interest/concern for management or conservation action plans by Y3Q1	4.1 Documentation shared on project Teams site.	The creation of a short list of species of interest / concern for prioritised management or conservation on DG.	Review of list of species on Teams site.	Project leader, work package leads and US Naval Facility will draft short list.	Once, Y3Q1.	1 day
4.2 Draft management plans for at least 2 species of interest / concern available by Y3Q2.	4.2 Draft document on Teams site	The creation of at least 2 draft management or conservation plans for species of interest / concern on DG.	Review of plans on Teams site show at least 2 draft action plans.	Project leader, work package leads and US Naval Facility will contribute to writing draft plan.	Once, Y3Q2.	10 days
4.3 Peer reviewed Management plans available by Y3Q3.	4.3 Finalised Documents on BIOTA website.	The creation of at least 2 management or conservation plans for species of interest / concern on DG; documents shared on BIOTA website; popular articles written	Review of plans on BIOTA website and summaries in popular articles.	Project leader, work package leads and US Naval Facility will contribute to writing plan.	Once, Y3Q3.	3 days
5.1 Project brief downloaded from BIOTA website at least 20 times by Y3Q4.	5.1 Download metrics (Google analytics) are recorded and summary statistics reported through HYR and ARs	Project brief is on BIOTA website; project brief has been viewed.	Search of BIOTA website reveals project brief; use of Google analytics for BIOTA website.	Project leader, work package leads will contribute to creating brief.	Uploaded once and analytics reviewed monthly in Y2 and Y3	1 day
5.2 At least 4 lay articles published by Y3Q4.	5.2 Articles published and summary information reported through HYR and ARs.	Number of articles created and host organisation for the article.	Search of organisational websites.	Project leader, work package leads and US Naval Facility will contribute to writing materials.	As articles submitted and accepted, by Y3Q4.	4 days
5.3 Publication of scientific results at international conference proceeding (oral or poster) by Y3Q4.	5.3 Conference proceedings and reported through HYR and AR.	The presence of the project in a conference proceeding.	Review of conference proceedings.	Project leader, work package leads and US Naval Facility will contribute to writing abstract and co-	Before attending conference by Y3Q4.	3 days

				authors on presentation.		
5.4 One Journal article on INNS on DG submitted to Open Access journal by Y3Q3.	5.4 Journal confirmation email; draft article.	The submission of a paper to an Open Access Journal	Confirmed submission via email.	Project leader, work package leads and US Naval Facility will contribute to writing abstract and co-authors on presentation.	Once, by Y3Q4.	10 days

Annex 3: Standard Indicators

Table 1 Project Standard Indicators

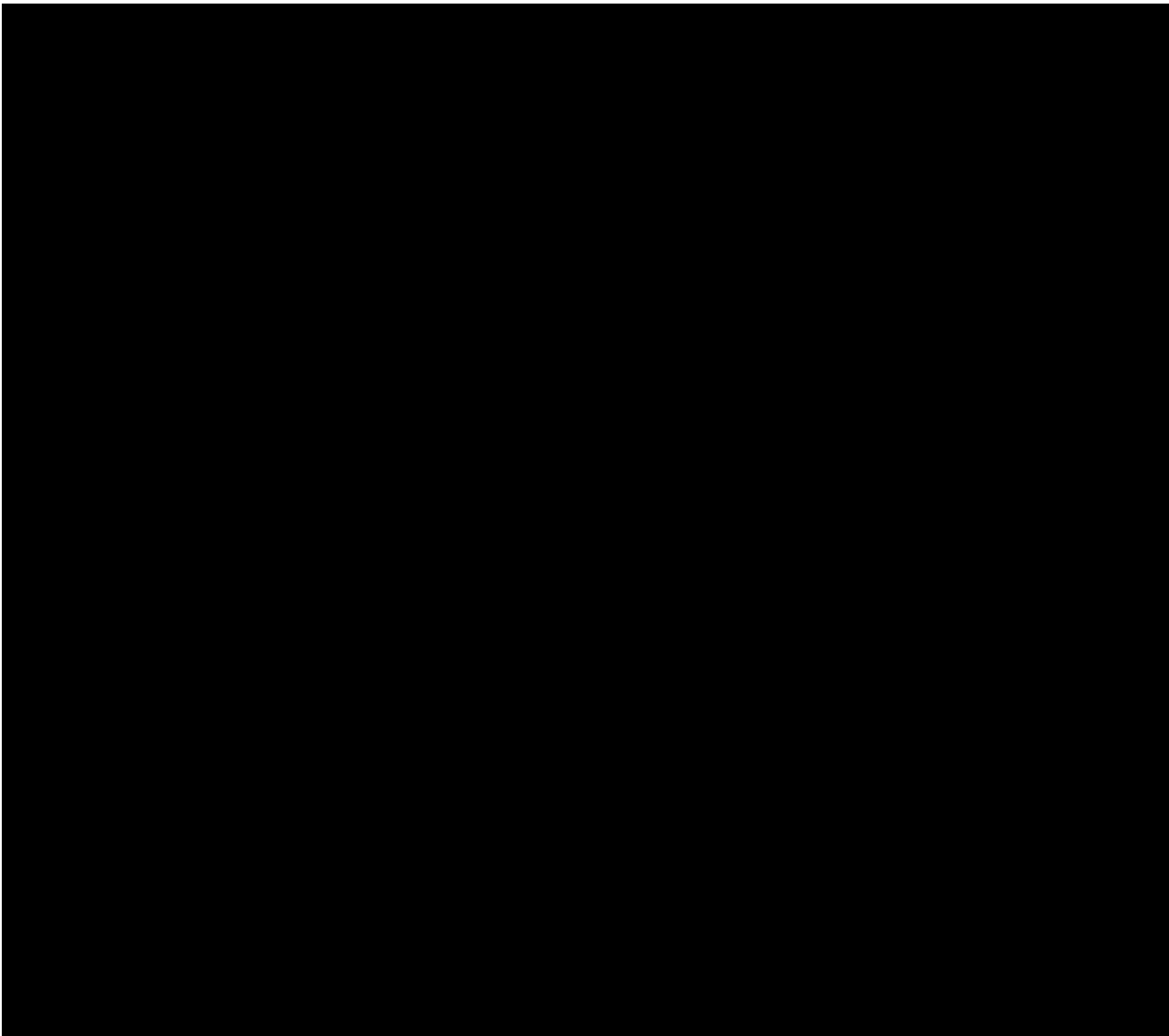
DPLUS Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DPLUS Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DPLUS-A01	3.2 Biosecurity surveys taken by at least 20 trained staff demonstrate improvement in skills compared to baseline survey (Baseline to be established by Y3Q4).	Number of staff from US and UK military and civilian personnel who attended training on Biosecurity	People	Men Biosecurity	21	13		34	40
DPLUS-A05	3.4 "Train the trainer" event for Biosecurity and INNS awareness delivered to at least 5 US Navy Support Facility members by GBNNSS and wider project team completed and reported by Y3Q4.	Number of trainers trained reporting to have delivered further training by the end of the project.	Number	Men Women Biosecurity		1		1	2
DPLUS-A07	2.1 BIOTA Environment staff trained in species-specific survey methods Y2Q1 and repeated in Y3Q1.	Number of government institutions/departments with enhanced awareness and understanding of invasive non-native species and conservation	Number	Government institutions	1				1
DPLUS-B04	4.2 Draft management plans for at least 2 species of interest / concern available by Y3Q2.	Number of new/improved species management plans available and endorsed	Number	Language (English)					2
DPLUS-B05	1.3 Database holds data from samples collected by BIOTA and shipped to UK by Y3Q1.	Number of people with increased participation in citizen science <i>adapted as records made include citizen science records from iNaturalist</i>	People	Biological recording		6		6	8
DPLUS-C02	2.5 Full species inventory available for identified species by Y3Q4.	Number of species records documented	Number	Species		7,796		7,796	TBC
DPLUS-C17	5.4 One Journal article on INNS on DG submitted to Open Access journal by Y3Q3.	Number of unique papers published in peer reviewed journals	Number	Annual downloads Journal					2
DPLUS-D01	3.3 Pathway Action Plans available to support biosecurity recommendations for BIOTA, US Navy Support Facility and military by Y3Q4.	Islands protected from INNS with increased awareness and pathway action plans	Number	Island name				1	1

Table 2 Publications

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
Dermaptera of the British Indian Ocean Territory	Online guide	Mitschunas, 2023	Female	German	iNaturalist	https://www.inaturalist.org/guides/16747
Phthiraptera and Psocodea of the British Indian Ocean Territory	Online guide	Mitschunas, 2023	Female	German	iNaturalist	https://www.inaturalist.org/guides/16749
Decapoda of the British Indian Ocean Territory	Online guide	Mitschunas, 2023	Female	German	iNaturalist	https://www.inaturalist.org/guides/16750
Isopoda of the British Indian Ocean Territory	Online guide	Mitschunas, 2023	Female	German	iNaturalist	https://www.inaturalist.org/guides/16755
Gastropoda of the British Indian Ocean Territory	Online guide	Mitschunas, 2023	Female	German	iNaturalist	https://www.inaturalist.org/guides/16756
Hemiptera of the British Indian Ocean Territory	Online guide	Mitschunas, 2023	Female	German	iNaturalist	https://www.inaturalist.org/guides/16748
Araneae of the British Indian Ocean Territory	Online guide	Peyton and Tricarico, 2023	Female	British	iNaturalist	https://www.inaturalist.org/guides/16401
Blattodea of the British Indian Ocean Territory	Online guide	Peyton and Tricarico, 2023	Female	British	iNaturalist	https://www.inaturalist.org/guides/16403

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
Bryophytes of the British Indian Ocean Territory	Online guide	Mitschunas and Peyton, 2023	Female	German	iNaturalist	https://www.inaturalist.org/guides/16734
Fungi of the British Indian Ocean Territory	Online guide	Mitschunas and Peyton, 2023	Female	German	iNaturalist	https://www.inaturalist.org/guides/16732
Lichen of the British Indian Ocean Territory	Online guide	Mitschunas and Peyton, 2023	Female	German	iNaturalist	https://www.inaturalist.org/guides/16662
Non-native plant species of the British Indian Ocean Territory	Online guide	Peyton, Frohlich, Barrios, Bensusan 2023	Female	British	iNaturalist	https://www.inaturalist.org/guides/15968
Birds of the British Indian Ocean Territory	Online guide	Mitschunas and Carr 2023	Female	German	iNaturalist	https://www.inaturalist.org/guides/16757
Odonata of the British Indian Ocean Territory	Online guide	Peyton, 2023	Female	British	iNaturalist	https://www.inaturalist.org/guides/16400
Hymenoptera of the British Indian Ocean Territory	Online guide	Guillem, Bensusan and Peyton, 2023	Female	British	iNaturalist	https://www.inaturalist.org/guides/16404
Coleoptera of the British Indian Ocean Territory	Online guide	Peyton, 2023	Female	British	iNaturalist	https://www.inaturalist.org/guides/16399
Diptera of the British Indian Ocean Territory	Online guide	Peyton, 2023	Female	British	iNaturalist	https://www.inaturalist.org/guides/16402

Title	Type (e.g. journals, manual, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)
Lepidoptera of the British Indian Ocean Territory	Online guide	Peyton, 2023	Female	British	iNaturalist	https://www.inaturalist.org/guides/16398
Orthoptera of the British Indian Ocean Territory	Online guide	Peyton 2023	Female	British	iNaturalist	https://www.inaturalist.org/guides/16397
Amphibians and reptiles of the British Indian Ocean Territory	Online guide	Adriaens, Tricarico and Peyton, 2023	Female	Belgium	iNaturalist	https://www.inaturalist.org/guides/15976
Miniguide to invasive species	PDF	Peyton et al 2023	Female	English	Field Studies Council	
Customs biosecurity leaflet	PDF	Peyton et al 2023	Female	English	Internal use only	



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 BCF-Reports@niras.com putting the project number in the Subject line.	X
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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.	
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see section 15)?	X

Have you involved your partners in preparation of the report and named the main contributors	X
Have you completed the Project Expenditure table fully?	X
Do not include claim forms or other communications with this report.	

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