Darwin Initiative Main Project Annual Report

Important note: *To be completed with reference to the Reporting Guidance Notes for Project Leaders: it is expected that this report will be no more than 10 pages in length, excluding annexes*

Submission Deadline: 30th April 2017

Darwin Project Information

Project reference	23-003
Project title	Eradicating invasive species from the highest priority Caribbean island
Host country/ies	Antigua and Barbuda (with Montserrat)
Contract holder institution	Fauna & Flora International
Partner institution(s)	Department of Environment (Government of Antigua and Barbuda), Environmental Awareness Group, British Mountaineering Council, Wildlife Management International Ltd.
Darwin grant value	£ 285,000
Start/end dates of project	Apr 2016 – Mar 2019
Reporting period and number	Apr 2016 – Mar 2017; Annual Report 1
Project Leader name	Dr Jenny Daltry
Project website/blog/Twitter	Not yet
Report author(s) and date	Dr Jenny Daltry, April 2017

1. Project rationale

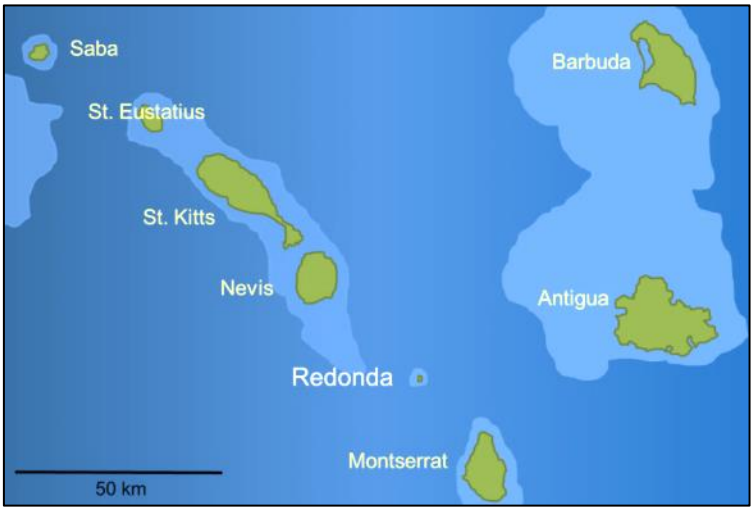
Caribbean islands cover only 0.15% of the Earth's land area, yet have accounted for 10% of the world's bird extinctions, 38% of mammal extinctions, and >65% of reptile extinctions since 1500. At least two-thirds of extinctions on islands have been attributed to invasive alien species, especially rats, mongooses and other mammals from the Old World. This is the first Darwin Initiative project to address such species on a Caribbean island outside of the UKOTs.

Redonda is a small island 56 km Southwest of Antigua and 23 km Northwest of Montserrat. The urgent need to save its biodiversity from invasive alien mammals was confirmed through regional workshops attended by governments, NGOs and academics from 23 Caribbean nations in 2009 and 2015, which identified Redonda as the top priority for restoration due to its critically endangered wildlife and excellent prospects of success. The island was prized by Britain for its seabird guano until the outbreak of World War 1 forced its mining community to leave. Redonda has been a dependency of Antigua & Barbuda since 1967 but is now uninhabited and rarely visited except by a handful of artisanal fishers and British volcanologists who use the island as a fixed observation point for Montserrat. It is a difficult island to get to, being remote and encircled by high, crumbling cliffs and scree slopes.

Although only 1.5km long and less than 80 hectares in surface area, Redonda supports rare and important biodiversity. These include five endemic reptile species— four of them Critically Endangered— and an uncertain number of endemic invertebrates and plants. The island has been designated an Important Bird Area because of its globally significant, if dwindling, seabird colonies. Pre-project surveys by FFI and our partners confirmed that the diversity and abundance of the island's native fauna and flora were still in sharp decline due to feral goats

Capra hircus d. (inferred to be an unusual, long-horned breed from Spain) and over 5,000 black rats *Rattus rattus*. The island has become so severely deforested and eroded that even the surrounding reefs were choked and broken by heavy soil run-off and falling rocks.

This Darwin project aims to eradicate the rats, translocate the goats to Antigua (where the Department of Agriculture will study and preserve this rare breed), and expedite the recovery of native species and habitats. This project has firm backing from civil society and the governments of Antigua & Barbuda and Montserrat, who share a common vision for Redonda as an internationally recognised centre for island restoration, conservation and research.



(Above) Aerial photograph of Redonda in July 2016. (Left) Map showing the location of Redonda. Pale blue indicates the shallow banks that formed land bridges during the Pleistocene, but Redonda has always remained fully enclosed by sea**.**

2. Project partnerships

This Darwin project is coordinated by Fauna & Flora International (FFI) with the four partners named on the proposal: the Department of Environment (DoE, the lead agency representing the Government of Antigua & Barbuda), the Environmental Awareness Group (EAG, lead local NGO), Wildlife Management International Ltd (WMIL, New Zealand-based company specialising in invasive species eradications) and British Mountaineering Council (BMC, which provides technical support for work on cliffs). FFI has worked with all four partners before, including more than five years to research and develop this island restoration project. We were therefore ready to "hit the ground running" as soon as the Darwin Initiative grant was approved. All four partners were very actively involved in project planning and implementation throughout Year 1. For example, DoE staff helped to design the biodiversity monitoring programme, facilitated the imports of many tonnes of project equipment and supplies, and researched options for designating Redonda a protected area. The EAG spearheaded the survey of local knowledge and attitudes towards Redonda, participated in fieldwork and actively communicated the project through local and regional media. WMIL drafted the first health and safety guidelines for fieldworkers on Redonda and their senior ecologist served as lead technician for the rat eradication operation, spending a full 11 weeks based on the island. BMC assisted with selecting skilled mountaineers and procurement of climbing equipment, and their leading rope access safety expert spent four weeks on Redonda to identify and establish safe routes.

Relationships between FFI and the aforementioned partners proved very effective throughout Year 1. Our staff and interns have genuinely enjoyed working together and learning from each other, recognising that each partner brings valuable skills and knowledge. While the project met with some daunting challenges— such as importing weapons, accessing tall cliffs, and maintaining a relatively large team of fieldworkers for months in remote, desert conditions— all of the agencies pulled their weight to help solve problems and ensure every stage has gone as smoothly and efficiently as we could have wished for.

Day-to-day management of the project in Year 1 was handled by Dr Jenny Daltry (FFI), Dr Helena Jeffery-Brown (DoE) and Natalya Lawrence (EAG), together with our dynamic young Project Coordinator, Shanna Challenger. Ms Challenger is jointly employed by FFI, DoE and EAG— a novel arrangement that has worked in the project's favour by enabling her to readily access facilities and support from all three as needed. This gave her valuable insights into how international NGOs, local NGOs and government agencies operate, enabling her to help

ensure we work together effectively towards a common goal. This female core management team is further supported by the Project Steering Committee: a body of 23 expert advisers, including representatives from all the partners and other key participating organisations (see Annex 4 for details). The Project Steering Committee met quarterly to review project progress, help to resolve any problems and discuss upcoming activities. This arrangement has worked very well to date and the project is fortunate to be able to draw on such a wide range of willing hands and expertise, not to mention influence.

3. Project progress

3.1 Progress in carrying out project Activities

The project is on track and has already made excellent progress. Below is a summary of progress against the agreed timetable (showing only activities that were intended to take place in Year 1 or that have begun ahead of schedule):-

Output 1 Alien invasive vertebrates (rats and goats) successfully removed from Redonda, with systems in place to prevent (re)invasions

1.1 Complete Operational Plan and SOPs to remove goats and eradicate rats (COMPLETED)

After conducting field surveys, field trials and extensive consultations in Q1 and Q2, the operational plan for removing the feral goats was completed in August (led by the internationally renowned goat removal specialist Dr Karl Campbell from Island Conservation) while the operational plan for eradicating rats was completed in September (led by rat specialist Elizabeth Bell, WMIL): Both plans were reviewed and approved by the Project Steering Committee and other invited peer-reviewers. Vital Standard Operating Procedures (e.g. how to trap goats, how to store and handle rodenticide safely) were incorporated into these plans, plus a special SOP was developed for the use of firearms to cull the goats by Goat Removal Adviser Peter Haverson to meet the requirements of the Royal Police Force of Antigua & Barbuda. The project team also conducted Risk Assessments of all island-based field activities in Year 1 and produced the detailed Health and Safety Plan, which all persons involved in this Darwin project are required to abide by. The three main technical reports are: Bell, E.A (2016) *Health and Safety Plan for Fieldworkers on Redonda*, Redonda Restoration Programme, St John's, Antigua; Bell, E.A. & Daltry, J.C. (2016*) Operational Plan for the Eradication of Black Rats* Rattus rattus *From Redonda (Antigua and Barbuda)*, Redonda Restoration Programme, St John's, Antigua; Campbell, K. *et al.* (2016) *Redonda Feral Goat Rescue: Operational Plan,* Report from Island Conservation to the Redonda Restoration Programme, St John's, Antigua. The operational plan for eradicating rats is intended to be copy-edited and posted online shortly, but not the goat plan because the implementation team had to adopt different methods from those originally proposed (see 1.2). The plans and protocols guided the purchase of the necessary equipment and supplies, including specialist climbing and survey gear from the UK. The Government of Antigua & Barbuda helpfully exempted the project from all import duty and VAT, while the DoE organised brokerage.

1.2 Capture and transfer goats from Redonda to enclosed government farmland on Antigua (COMPLETED)

At the start of this project, there were an estimated 60–80 feral rare-breed goats on Redonda. The operation to remove them began on schedule in Q3 under the direction of Peter Haverson, a livestock and animal control expert from the UK. A self-muster corral was constructed, as per the operational plan (1.1), with a water trough to attract the goats and one-way spear gates to enable them to enter but not leave. Unfortunately, abnormally wet and stormy weather meant that the goats were not sufficiently interested in the trough, and Mr Haverson therefore adopted alternative live capture techniques, including snares, foot-hold traps and a net gun. These were not without difficulties (e.g. rats gnawed through the snaring equipment and strong winds made the net gun impossible to deploy). The goat capture phase therefore continued into Q4 to allow more time for FFI to catch a viable herd, and for the Veterinary & Livestock Division (VLD) to prepare its facility for conserving this rare breed on Antigua. Fortunately, capture success improved sharply during the dry season (Q4), when the now-starving goats were attracted to the corral area. Most goats were captured simply by cornering them against fences. Unweaned kids were bottle-fed and transferred to veterinarian Fiona Francis on Antigua, while the rest

were transferred to the VLD facility. All goats were inspected by Dr Francis and government veterinarians on arrival, tagged and treated for parasites. They were in very poor condition on arrival: typically extremely thin and evidently malnourished from birth. Rescue came too late for some, as at least half a dozen goats were found dead from starvation on Redonda in January. Some of the weaker ones died shortly after capture despite the veterinarians' best efforts. By the end of Q4, however, over 40 goats had been successfully relocated to Antigua. At the time of writing, most goats are feeding well and are used to being handled. Animals that could not be moved (e.g. old males in obviously poor health) were humanely shot, with government permission. Mr Haverson will conduct a final check of Redonda in May 2017 and possibly again in 2018, but we believe the capture phase has ended.

1.3 Establish baiting grid on Redonda and eradicate rats (COMPLETED)

At the start of this project, there were more than 5,000 highly carnivorous black rats on Redonda. Bait (Klerat) was provided free of charge by Syngenta and the operation to eradicate rats from Redonda began on schedule at the end of January (Q3) under the direction of Rat Eradication Team Leader Elizabeth 'Biz' Bell (WMIL) and Jack Ibbotson, a mountaineer appointed by FFI to supervise the climbers. Adam Long (BMC/ Access Techniques Ltd) joined the team for the first few weeks to identify safe climbing routes and install attachment bolts. The methods and approach were much as described in the Operational Plan, and will be detailed again in the forthcoming technical report. The first task was to set up the abseil and mountaineering routes, and demarcate the sites where bait would be placed by hand. A 30 x 30 metre grid, comprising 294 baiting stations, was established across the top of the island (where accessible on foot) by our four ground team members, plus 20 stations for hand-broadcasting or lowering bait on lines onto ledges. The project's seven climbers set up climbing routes and placed a further 48 bait stations on the cliffs. Another 67 bait stations were installed around the coast, just above the high tide mark, giving 469 bait stations in total. These were demarcated with flagging tape and spray paint. Most stations comprised a clear plastic tube, wired to the ground, into which the bait could be secured with additional wire. Klerat® bait was first deployed across the island in the third week of February 2017. Almost every station was checked and, where necessary, replenished daily. In areas that could not be accessed safely, bait was hand-broadcast from a helicopter. Baiting continued almost daily for seven weeks. Bait take was very high for the first seven days, but quickly dropped to almost nothing by the end of the second week. Most rats died underground, as expected, but the team diligently collected and destroyed all carcasses found. From 1st March, the team also deployed non-toxic monitoring tools at and between the bait stations to detect any surviving rats, including soap, tracking plates, chocolate-flavoured wax and camera traps. The last known rats on Redonda were detected and killed in the second week of March. No more signs have been seen since.

1.4 Establish biosecurity surveillance system to prevent incursions, and monitor Redonda every 2 months to verify no invasive vertebrates remain (UNDERWAY)

Ahead of schedule, 39 permanent bait stations were installed on Redonda in late Q4 to help detect and kill rodents. These comprise a rugged plastic bait box, bolted onto a pedestal to raise it 15 cm above the ground. The boxes contain at least 80 g of Klerat and chocolate-scented rubber blocks. Other aspects of the biosecurity system will come into effect in Year 2.

1.5 Publish technical report(s) detailing the methods, results and any lessons learned from Output 1 (UNDERWAY)

Although the final technical reports on the goat removal operation and the rat eradication operation are not due until early Year 2, the project team has already produced a suite of illustrated technical progress reports, including weekly reports from the rat eradication operation (Annex 4). These have been disseminated to all members of the Steering Committee and other interested stakeholders and highlight some of the challenges and lessons learned.

Output 2 Monitoring system established to measure the responses of fauna, flora and ecological processes to the removal of alien invasive vertebrates

2.1 Project scientists design and agree standardised methods to monitor birds, reptiles, bats, invertebrates, plants, soil and microclimate (COMPLETED)

Baseline terrestrial survey methodologies were drafted through a series of meetings with the

project Steering Committee and local volunteer biologists. These included a multi-agency workshop in Q3 to forecast the ecological changes that could take place and how they can be measured. Where possible we adopted research methods used on Redonda previously (to allow comparison with earlier baselines, e.g. Bell & Daltry, 2012) or on other Caribbean islands. These include, for example, standardised point counts for land birds and lizards, pit-fall trapping of ground-living invertebrates, and data-loggers to monitor long term changes in ambient temperature and relative humidity. Mindful of the high cost of travel to Redonda, we are focusing on relatively rapid techniques. A manual of the methods is under development (75% completed). In addition to terrestrial monitoring, the project team took the opportunity to begin monitoring the surrounding marine life, including fish transects and fixed photo quadrats of the fringing reefs. The first marine surveys were funded by Waitt Foundation, and proved very valuable in light of (a) the discovery that the reefs are being heavily impacted by rock falls and run-off from the severely eroded island (which should improve measurably now that rats and goats have been removed) and (b) the need for baseline data to support the designation of Redonda and the surrounding sea as a 'ridge-to-reef' protected area (Output 3).

2.2 Conduct monitoring as per 2.1 during the grant period (before and after removing the goats and rats) (UNDERWAY)

Baseline data were collected by the project team on birds (whole colony seabird counts, 2 seabird transects and a number of land bird point counts), reptiles (over 100 point counts established), invertebrates (two rounds of pitfall trapping and malaise trapping in Q4) and plants (species checklist and 15 fixed point photos), timed to fit in with travel under Output 1. This activity has already revealed species never before reported on Redonda (some of which may be new to science), and we have rediscovered a rare, probably endemic lichen (identified from photographs by Dr Holger Thues, Natural History Museum, London). Most of the new plant records were found by British mountaineers on cliffs that the goats could not easily reach. Particular attention was paid to the island's Critically Endangered reptiles, and in Q4, we were pleased to host the first visit by herpetologists from Harvard, Yale and Paris to begin a long-term study of how removing invasive mammals affects the population sizes, ecology and evolution of island lizards. A dozen soil samples were collected for analysis and the first two data loggers installed to monitor long term changes in microclimate (six more will be deployed shortly). Meanwhile, the complimentary marine surveys by the DoE and Waitt Foundation divers established 8 fixed photo plots for nearshore reefs and 8 fish transects at 10-m depth. Our findings in 2016 showed an overall reduction in bird populations, reptile populations and vegetation cover compared to previous years, probably due to the severe impacts of goats and rats. However, Q4 pointed to some promising new developments that might be attributed to reducing and removing the invasive mammals. These include a conspicuous rise in insect activity and the welcome recent arrival of at least one bat, shearwaters and several land birds that have not been reliably recorded on Redonda for years.

2.4 Publish technical reports detailing the results and lessons learned from Output 2 (UNDERWAY)

The project team and collaborating scientists have begun preparing publications from the biodiversity surveys. These include a preliminary report on the lizard studies in Q4 and two new *IUCN Red List of Threatened Species* accounts, on the Redonda ground lizard *Pholidoscelis atrata* (*Ameiva atrata*) and Redonda skink *Copeoglossum redondae* (Daltry, 2016a,b).

Output 3 Redonda becomes a protected area in accordance with the Sustainable Island Resource Management Zoning Plan for Antigua & Barbuda, with an effective structure to manage its ongoing ecological recovery and sustainable use

3.1 Complete stakeholder consultations in Antigua and Montserrat (COMPLETED/ ONGOING)

Stakeholder consultations were conducted in Antigua throughout the year, with dozens of individual and group meetings with a wide range of interested individuals and organisations. These included an evening public presentation and questions-and-answers session at the National Museum in St John's, Antigua. Senior members of the team also travelled to Montserrat in Q2, Q3 and Q4 to discuss various aspects of the project with the Department of Environment, Department of Agriculture and local fishers, who have a tradition of fishing around Redonda and hunting the goats. In Q4, the project leader also travelled to St Kitts & Nevis as

part of another project and talked with local fishers and tour operators who sometimes approach Redonda. Although the workplan in the original proposal indicated this activity would cease after Year 1, we believe active engagement with stakeholders in all three countries ought to continue, especially in light of the need for regional cooperation to safeguard the island and its biodiversity under Output 3. Following consultations with Dr Reg Murphy from the National Parks Authority and UNESCO, the NPA provided two archaeologists to survey Redonda to (a) Assess and describe the buildings, Amerindian middens and other historical features that will add weight to designating Redonda a protected area, and (b) Advise the project field biologists on "dos and don'ts" to avoid damaging the archaeology (e.g. ensuring the fence posts for the goat corral are not places in areas that could damage important sites): Waters, C., Brown, M., & Murphy, R. (2016) *Preliminary Report on the Cultural Heritage of Redonda.* Report to the Redonda Restoration Programme, St John's, Antigua. Further studies are planned in 2017.

Output 4 National capability to plan, manage and implement and monitor invasive species projects is raised, supported by enhanced technical skills and greater public awareness and cooperation

4.1 Plan multi-media campaign to communicate project to the public on Antigua and Barbuda and neighbouring states (COMPLETED)

The project's communication strategy was developed through a 2-day workshop with local stakeholders in May 2016, facilitated by the project's Education and Outreach Officer Ms Natalya Lawrence (EAG), Dr Helena Jeffery-Brown (DoE) and Dr Jenny Daltry (FFI). Participants identified the various stakeholder/ audience groups, what we would like them to know and do, and how to convey these messages to them. Interestingly, this process revealed that for most target groups, the most effective means of communication were through personal meetings, radio phone-in shows, and social media: methods that cost nothing but time. Ms Lawrence also conducted a public questionnaire survey to evaluate local knowledge and attitudes towards Redonda to serve as the baseline for evaluating changes resulting from this project's education and outreach activities: Lawrence, S.N. (2017) *Redonda Knowledge Surveys Report,* Redonda Restoration Programme, St John's, Antigua. Despite confirming there are widespread myths and misconceptions about Redonda (e.g. many interviewees thought it was a separate country, not part of Antigua & Barbuda), we were pleased to note that 96.3% of interviewees agreed that the island should be protected.

4.2 Implement campaign, including media releases, signage on Redonda and phone-in radio shows, and evaluate impact on public (UNDERWAY)

FFI and our partners issued a joint media release in July (see http://www.fauna-flora.org/news/captivating-caribbean-island-to-be-given-a-new-lease-of-life/), which was widely picked up by the national media (e.g. *The Daily Observer, Antigua Chronicle*), regional radio stations and international media, including Mongabay.com and *The Guardian* (https://www.theguardian.com/environment/2016/aug/01/caribbean-island-launches-plan-to-remove-invasive-rats-and-goats). The project was also announced by an article by Ms Lawrence in *Zing*, the inflight magazine of LIAT, the Caribbean airline. Together with senior members from the EAG, the Project Coordinator made several appearances on national television to discuss the removal of invasive species and published an article in *The Observer* about the rat eradication. Temporary signage was installed on Redonda in December 2016 to alert any visitors to the conservation work taking place, and to warn persons not to tamper with the rat bait. Local journalists were invited to Redonda at the end of Q4 to learn more about the island and interview the field team. The impact of this activity will be more formally assessed in Year 3 (by repeating the questionnaire survey in 4.1) but to date the feedback received has been overwhelmingly positive and supportive. Redonda is exciting a lot of interest.

4.3 Analyse training needs of field personnel (UNDERWAY)

Appraisals have been led by Dr Daltry with input from the other project technical experts, including Dr Karl Campbell, Peter Haverson (Goat Removal Advisors) and especially Elizabeth Bell (Rat Eradication Team Leader), who worked extensively alongside local field personnel in Year 1. These assessments were less formal than originally envisaged, due to heavy demands on everyone's time, but we paid special attention to capacity gaps and needs with regards to project management, invasive species control, and biodiversity surveys and monitoring. While

more than a dozen persons in Antigua already have some very relevant field skills (e.g. bird identification, mark-recapture surveys, safe use of rodenticide), few appear to be confident in data management and analysis, and report writing, and there is very little local capacity for island biosecurity. Some training took place in Year 1 (see 4.4 and 4.5 below) and more formal analyses and training will be addressed during the remainder of this project.

4.4 Conduct training classes and on-the-job mentoring for local personnel participating in eradication and biosecurity activities (UNDERWAY)

Although not formally scheduled to begin until Q4, the project's Education and Outreach Officer Natalya Lawrence participated in an invasive species workshop with RSPB in Montserrat in Q2, at which she taught more than 20 personnel (mainly from Montserrat and other UKOTs) how to eradicate rats and prevent incursions. Further presentations and workshops by the project team in Q1 and Q2 introduced Antiguan government and NGO technical staff to methods for detecting and eradicating invasive alien mammals, and why this is important for biodiversity conservation. These were reinforced with hands-on practical work during the goat removal and rat eradication operations. Attendance records show at least 20 Antiguans participated in invasive species fieldwork on Redonda in Q3 and Q4: Dr Reg Murphy (National Parks Authority), Dr Helena Jeffery Brown, Jason Williams, Michai Robertson, Appoy Robinson and 'Ziffy' (DoE), Darryl George, Sean Lee, Tahambay Smith (EAG), Mr Adriel Thibou (Forestry), and Sharon Dalso, Gerard and Andelle Trotman (Community Development), Thaddaus Spencer, Deron Jarvis, Craig Joseph, Lennox Henry and Astley Joseph (Department of Agriculture), Shanna Challenger and Salina Janzan. Ms Janzan notably spent almost the whole of Q4 on Redonda and became so proficient in the goat removal operation that she led this component when Mr Haverson was in the UK.

4.5 Conduct training classes and on-the-job mentoring for local personnel participating in biodiversity monitoring (UNDERWAY)

Methods for monitoring birds, reptiles, plants and other species were discussed and developed with more than a dozen local technical personnel, including the EAG's volunteer field biologists (Andrea Otto, Joseph Prosper and Victor Joseph), independent consultant Kevel Lindsay, and staff from the DoE (Amelie Bird, Ruleo Carmacho, Raisa Spencer, Appoy Robinson), Fisheries Division (Tricia Lovell, Steven Archibald), Forestry Unit (Adriel Thibou) and Community Development (Sharon Dalso, Andelle Trotman) through a series of meetings, including a monitoring design workshop in November 2016. Five nationals participated in wildlife surveys in Year 1: a number constrained only by the limited availability of tents and transport to Redonda while activities 1.2 and 1.3 took place. Many more expressed enthusiasm to participate in biodiversity surveys and monitoring, and we aim to enlist as many people as our travel budget will allow in Year 2. A wide range of equipment was obtained for surveys by local personnel, including GPS units, binoculars, malaise trap, data-loggers and reference books.

4.6 Local technicians participate in project meetings and key field activities with FFI training and mentoring where needed (UNDERWAY)

From the start of this project, FFI staff have worked alongside at least 30 Antiguans from government agencies, NGOs and the private sector. Sixteen are members of the Project Steering Committee (see below), and most are colleagues from government agencies and NGOs. Since Q2, particular attention was paid by FFI to building the skills and experience of Shanna Challenger, the Antiguan ecologist who was appointed as Programme Coordinator. Ms Challenger spent 10 days with FFI in Cambridge in Q2 for training in project management and was subsequently involved in every aspect of project planning and implementation, working alongside the FFI Project Leader, Dr Jenny Daltry, and FFI's Eastern Caribbean Projects Coordinator, Sophia Steele.

Output X Project Management

X.1 Project inception meeting (COMPLETED)

The Inception Meeting was held over two days in May 2016 at the DoE meeting room in St John's Antigua. Participants included 25 representatives from the relevant government agencies (including Environment, Forestry, Fisheries, National Parks Authority, National Archives), EAG, local schools, tourism businesses and Caribbean Helicopters Ltd.

X.2 Project Steering Committee meetings (UNDERWAY)

The Project Steering Committee was formed at the Inception Meeting in Q1, and met again in Q2, Q3 and at the end of Q4. Sub-units have also evolved to help plan and review areas of the project relevant to their skills and interests. These include a working group on the feral goats (representatives from FFI, EAG, DoE, Agriculture and Caribbean Helicopters Ltd) and a working group on marine surveys (representatives from FFI, EAG, DoE and Fisheries).

X.3 Project biannual reports/ donor technical and financial reports (ONGOING)

Reports produced by FFI to date include an internal FFI annual report for 2016, the first financial report to National Fish & Wildlife Foundation, two reports to Taurus Foundation, the first half-year report to Darwin Initiative, and illustrated updates to private sponsors.

X.4 Monthly financial accounts (ONGOING)

FFI maintains detailed accounts of spending each month, which are available for inspection at any time. Expenditures through the EAG (local partner NGO) were easily monitored thanks to a separate bank account for this project. The Project Coordinator oversees spending through this account and reports to the Project Leader at least once a month.

3.2 Progress towards project Outputs

Output 1: Alien invasive vertebrates (rats and goats) successfully removed from Redonda, with systems in place to prevent (re)invasions: At the start of this project, the primary threats to Redonda were the presence of feral goats and black rats. During Year 1, the operations to remove the rats and goats appear to have been very successful. The project indicators and means of verification still stand (Annex 1). At the time of writing, over 40 goats from Redonda are registered at the Veterinary & Livestock Division (VLD) facility on Redonda, plus a small number of kids are being reared by veterinarian Dr Francis. It is doubtful whether any goats remain to be caught, but our goat team will conduct another sweep of the island in May 2017 and again in 2018 to ensure none remain. Permanent bait stations have been installed to help prevent reinvasion by rodents, and the full biosecurity system will be established in early Year 2, as per the original work plan. No rats have been detected since early March, despite intensive use of a wide range of rodent monitoring tools (tracking plates, scented wax lures, camera traps, etc.) across the island. In accordance with international best practice, however, Redonda will not be officially declared rat free until a final check has been conducted after at least 12 months (i.e. at the end of Year 2). In addition to removing rats and goats, project members destroyed the *Casuarina equisetifolia* tree in Q4 to prevent the spread of this invasive alien (the tree was ring-barked and injected with glyphosate).

Output 2: Monitoring system established to measure the responses of fauna, flora and ecological processes to the removal of alien invasive vertebrates: At the start of the project, limited baseline data were available on the ecology of Redonda, e.g. the numbers of nesting seabirds, density of two lizard species and a preliminary checklist of vascular plants and invertebrates (see Bell & Daltry 2014). The project indicators and means of verification still stand (Annex 1). Rapid measures were launched in Year 1 to monitor birds (diversity and abundance of both seabirds and land birds), lizards (abundance and ecology), invertebrates, plants (diversity and abundance), soils (moisture, composition and fertility), ambient temperature and relative humidity. The project team will continue monitoring these biotic and abiotic variables using techniques that can be swiftly learned and applied by local technicians. To supplement the rapid programme, we have enlisted support from Harvard University for an in-depth long term study of the Critically Endangered lizards (entailing at least 10 days per year on the island), and are in discussions with other British, American and Caribbean scientists with the time and resources to investigate the island's ecological recovery to even greater depth.

Output 3: Redonda becomes a protected area in accordance with the Sustainable Island Resource Management Zoning Plan for Antigua & Barbuda, with an effective structure to manage its ongoing ecological recovery and sustainable use: At present, Redonda is entirely state-owned as a dependency of Antigua & Barbuda, but not actually protected. Aside from the preliminary stakeholder consultations under activity 3.1 (see above), a more concerted move towards this Output will not begin until Year 2. However, the DoE— the lead government agency for this project— has been working on a new national protected area systems plan,

which will help guide the designation of Redonda as a protected area. The indicators and means of verification still stand and we will have more to report in the next year.

Output 4: National capability to plan, manage and implement and monitor invasive species projects is raised, supported by enhanced technical skills and greater public awareness and cooperation: The indicators and means of verification still stand, and are due to be reported on in the next reports (Annex 1). At the start of this project, there was some relevant capacity among a small pool of Antiguans— chiefly staff and volunteers of the EAG, with whom FFI has worked on previous projects to remove rats and mongooses from offshore islands. Outreach and training activities under Output 1 (see above) have helped to expose more persons from other agencies to practical methods for tackling invasive species.

3.3 Progress towards the project Outcome

The project Outcome is "*The permanent removal of harmful invasive species triggers the recovery of endemic species, habitats and ecological processes on Redonda, and enhances Antigua & Barbuda's natural capital and conservation capacity*". Strong progress was made towards this in Year 1, and most indicators still appear to be valid and useful. Most importantly, with reference to indicator 0.1 (*No invasive vertebrates remain on Redonda by project end*), the last known rat was killed in early March 2017, and the goat translocation is, or will soon be, completed. The other indicators speak to the recovery of wild animals and plants, and, while the eradication operations were undertaken recently, we anticipate the target indicators will be reached, if not exceeded by the end of the project.

3.4 Monitoring of assumptions

Outcome: Assumption 1— Recent scientific research is correct in identifying rats and goats as the primary drivers of biodiversity loss on Redonda, and that at least some of these changes are reversible if the aliens are removed: Comments: This assumption is likely true, but given that the eradication operations have only just taken place (Output 1), it is too early to confirm that the decline of biodiversity will be reversed. We have noted, however, the arrival in March 2017 of a bat, Audubon's shearwaters and several land bird species that had not been seen on Redonda for years. This is consistent with the very rapid natural recolonization by birds observed by FFI on other islands cleared of rats e.g. Dog Island.

Output 1: Assumption 1— Rats on Redonda are susceptible to the same bait and baiting methods that have been successfully used on other Caribbean islands: This assumption appears to have held true. The rat eradication operation on Redonda looks to have been fully successful using Klerat bait distributed at intervals of not more than 30 metres. Rats showed no hesitation in taking the bait and there was no sign of any being resistant to the toxin. This will be confirmed in the Year 2 report (because at least 12 months must pass without any rats being detected before the island can be officially declared rat free).

Output 1: Assumption 2— No unusual and severe weather events during critical stages (this project will avoid conducting important activities during the hurricane season, especially August through October): This is largely true, although abnormally wet and windy weather after the hurricane season, in Q3, meant that the goat removal operation had to be extended into Q4. However, the most critically sensitive part of this project, the rat eradication operation, had no interruptions and went to plan (once baiting starts, it is best to continue without a break until the entire rat population has died). Other forthcoming project activities will more flexible and can be planned around the local weather forecasts.

Output 2: Assumption 1— Long term monitoring strategy accurately predicts the future human and other resources available to implement it: This assumption appears to be robust. Many persons in the government agencies and NGO have expressed keen interest to monitor Redonda, but we understand most are reluctant to stay on the island for long periods and worry about venturing into unsafe areas. Consequently, we have pitched the monitoring programme towards rapid techniques, most of which can be completed in 1–3 days, with permanent transects and quadrats focused on the 'safe zone' areas that can be accessed without climbing expertise. Inevitably, there is a question mark over the resources for travel to Redonda after the Darwin grant ends, but ongoing monitoring should be factored into the protected area management plan and budget (Year 3).

Output 3: Assumption 1— Continued cooperation among stakeholders: This assumption is important and still looks robust. Redonda holds a powerful fascination for many Antiguans and Barbudans (Redonda is their third sister island, yet few have been able to visit it). The project team light-heartedly refers to the typically very swift response to any requests or invitations to meetings about this project as "the Redonda Effect"! With reference to Output 3, we are particularly encouraged by the survey finding that 96.3% of Antiguans agreed that Redonda should be protected, and initial meetings on Montserrat in Year 1 indicate a strong willingness to cooperate from the island's nearest neighbour.

Output 3: Assumption 2— Government willingness to protect Redonda, in accordance with its own national land use plan and legislation: This assumption is important. All of the relevant government agencies have senior representatives on the Project Steering Committee, including DoE, National Parks Authority, Forestry, Agriculture and Fisheries, whose members have concurred the island should and can be protected, primarily for the purposes of biodiversity conservation. We are not aware of any decision-makers who do not agree, but are mindful that more work will need to be done in Years 2 and 3 to determine under which legislation this area will be protected (there are several options), and how much of the surrounding sea will be included (the land use plan refers only to the island itself, but this could be extend to the surrounding sea; potentially up to the national maritime boundary).

Output 4: Assumption 1— Trained expertise remains in Antigua & Barbuda and Montserrat. This is impossible to guarantee, but we aim to train a relatively large number of individuals—especially persons who are already in full time employment in relevant agencies—to maximise the chance that enough will remain in positions afterwards to apply the skills and knowledge gained from this project for the benefit of biodiversity conservation.

Output 4: Assumption 2— Increased knowledge results in positive attitudes and behaviours. It is probably too early to validate this assumption. Throughout Year 1, however, our team observed that most of the people we speak to are at first uncomfortable with the idea of removing goats from Redonda until they see photographs or videos of the landscape and photos of animals that have died from starvation. This is usually enough to convince them that the goats had to be rescued, and, equally, the island needs to be goat-free if its vegetation is to recover. In Q4 we witnessed a similar switch in attitudes among our project volunteers who were reluctant to destroy a casuarina *Casuarina equisetifolia*—one of the few trees left on Redonda— until they learned it is a toxic invasive alien species from Australia.

3.5 Impact: achievement of positive impact on biodiversity and poverty alleviation

The project is well on track to achieve its proposed impact— "*Significant recovery and regeneration of threatened species and habitats on Redonda is a source of national pride and directly informs and inspires other Caribbean nations to eliminate harmful invasive species*"— especially considering the progress we have made under Output 1 to remove the alien rats and goats. Experiences gained from this project are already being transferred by the team to other projects, including plans to eradicate rodents from three islands in the Turks & Caicos in 2017 and three more islands around Anguilla in 2018 (including the Darwin Plus project DPLUS060).

The primary focus of this project is biodiversity conservation rather than poverty alleviation. No-one lives on Redonda and it will take some time before the island may be safely used for tourism or other purposes. However, the rare-breed goats that have been relocated to Antigua are being studied by the VLD, which hopes that the goats will prove to have greater drought resistance than local breeds, and proposes to distribute the offspring to farmers in Antigua, Barbuda, Montserrat and other countries to help them adapt to climate change. As a clear sign of local interest in this breed, local farmers and veterinarians recently came up with the idea of forming the "Long-Horned Goats Society" to help preserve the breed.

4. Contribution to the Global Goals for Sustainable Development (SDGs)

This project principally addresses SDG 15 (*Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*), and the permanent removal of highly destructive goats and rats from Redonda (Output 1) in Year 1 will directly combat desertification, and halt and reverse land degradation and halt biodiversity loss. The island

should soon become protected under Output 3, and this project has a great opportunity to also address SDG 14 (*Conserve and sustainably use the oceans, seas and marine resources for sustainable development*) by also protecting the surrounding seas. Marine surveys in Q3 confirmed fears that the near-shore reefs are being severely impacted by erosion from the island, but this could be halted as vegetation recovers in the absence of goats and rats.

5. Project support to the Conventions, Treaties or Agreements

Under the Convention on Biological Diversity, the project is notably addressing article 8(h) "*Each contracting Party shall, as far as possible and as appropriate, prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species*". This project has removed two highly damaging invasive alien species from Redonda and is helping to transfer the necessary knowledge, skills and contacts to more local persons to support biosecurity for this and other key sites. The project also helps to deliver Article 8(a,d,f), including eliminating the main threats to, and protecting the entire range of, Redonda's critically endangered endemic reptiles, and Articles 7, 12 and 13. Redonda is biogeographically unique, and this project is working towards safeguard a significant proportion of Antigua & Barbuda's biodiversity. This project also honours the Nagoya Protocol on Access and Benefit Sharing requirements and principles. Notably, we have repatriated goats from Redonda to Antigua where this rare breed— which is inferred to be more drought-tolerant than other local breeds— will be conserved and utilized as a genetic resource for livestock farmers. The Focal Point in Antigua and Barbuda for the CBD, ABS and CITES Management Authority is the Director of Environment, Diann Black-Layne. The DoE is the lead government partner in this project, and our Project Coordinator is based at the DoE head office. Ms Black-Layne provided a letter of support for the Darwin proposal and continues to be kept abreast of project activities and outputs. As further evidence of her interest and support, she encouraged the project team to access new GEF funding (2018–2020) to support the conservation of Redonda.

6. Project support to poverty alleviation

Not very applicable, as explained in the proposal (Redonda is uninhabited).

7. Project support to gender equality issues

The project has been successful in ensuring local women are actively involved in all aspects of project planning and implementation, from junior to senior levels. For example, all 4 members of the core project management team are women (including the Project Coordinator and lead representatives from FFI, DoE and EAG); the Project Steering Committee currently has 8 women and 15 men; the core Rat Eradication Team comprised 3 women and 6 men; and the Goat Removal Team is comprised of two women and one man. Across the project, the gender ratio is almost 50:50. The team will continue to ensure women have equal access to training and other opportunities from this project.

8. Monitoring and evaluation

Regular and impartial monitoring and evaluation are necessary to help this project operate as effectively as possible. The Project Steering Committee (Section 2) meets at least once a quarter to review project progress, help to resolve any problems and discuss upcoming activities. Within this, technical working groups have formed to discuss and review specific aspects of the project. In addition, the project's operational plans (Output 1) and other project tools have been evaluated by independent specialists—including pest control experts from Island Conservation, RSPB and Syngenta— to ensure the project methods are robust and follow best practice. Scientific papers and reports will also be rigorously assessed through the peer-review process before being published.

Furthermore, through monitoring the project site, we aim to measure and demonstrate the impacts of eradicating harmful invasive alien species (Output 2). We have established measures and protocols for monitoring the flora, fauna and their changing environment on Redonda, including (to date) standardised measurements of soil, microclimate, plants, invertebrates, reptiles, birds and mammals. These will be measured several times during the grant period to establish the pre-eradication baseline, and to assess short term post-eradication

changes, and are intended to be routinely monitoring by trained local personnel long after this project ends as part of the management of the Redonda (Output 3). The success and usefulness of training exercises and exchange of knowledge (Output 4) will be assessed through competence self-assessment questionnaires of the beneficiaries. In Year 1, 4.4% of grant expenditure was spent on Monitoring and Evaluation (and the estimated total across all three years will be 7.8%).

9. Lessons learnt

Overall the project is going well to date, and has already accomplished some highly ambitious targets during its first year, including a major operation to eradicate rats from Redonda and successful capture and relocation of feral goats. This is no small feat given that the project site is remote, extremely arid, and much of it is steep and unstable. Full technical details of the invasive species operations will be presented in technical reports in early Year 2. This work has included a number of techniques and observations of possible use to other conservation organizations. For example:-

- The island camp housed up to a dozen fieldworkers at once but all electronic equipment, including laptops, walkie-talkies, phones, head torches and VHF radios, were successfully powered using portable solar panels alone. This is thanks to recent improvements in solar technology and the rising availability of equipment that can be charged via a USB cable.
- Captured goats proved invaluable for capturing more goats, as the animals more readily approached the corral when other goats were inside. Importantly, this also helped to alleviate stress among the captured animals: Captured goats became calmer and fed more readily when enclosed with other goats than when kept in isolation.
- Both ground-based baiting and aerial drops of bait can be combined successfully in the same rat eradication operation. Even where bait is dropped by helicopter, it is very useful to have skilled persons on the ground to thoroughly monitor the distribution and uptake of bait, clear up rat carcasses, and deploy monitoring tools to ensure no rats survive.
- The main bait used in this operation, Klerat®, again proved excellent for Caribbean islands. Acceptance by rats was high, the bait was completely ignored by non-target vertebrates, and the waxy bait was easy to handle and coped well with very high temperatures. We also learned their angular shape 'stuck' more easily to cliffs when broadcast from the air.
- Plastic tubes recycled from ordinary 1.5-litre water bottles are a useful, green alternative to commercial bait boxes in areas with livestock. They are easy to transport, and cost nothing.

Other lessons learned or reinforced by this project were:-

- At the early stages of a complex project, developing Memorandums among collaborating organizations is very useful for clarifying roles and responsibilities, and managing expectations from the start, especially for any groups that have not worked together before.
- Most invasive species projects in Small Island States depend heavily on international volunteers, due to limited availability of persons who can spend many weeks in the field. However, encouraging and enabling local people to take part, if only for a weekend, is crucial for building local ownership as well as the necessary know-how for future projects. On Redonda, we deliberately established a 'visitor trail' along the easiest route across the island to enable novices to safely take part in deploying bait and monitoring rat activity.
- The rat eradication was carried out in the dry season, when the rats had fewer alternative foods available and when there was no danger of hurricanes. Although this coincided with the breeding seasons of frigatebirds, boobies and tropicbirds, these colonies showed remarkably little sign of being disturbed by the rat eradication activities. Even birds nesting beside well-used trails raised young successfully.

This very busy first year could not have been possible without having invested in more than five years of research, planning and relationship-building to develop this project, recruited very dedicated and experienced persons, and paid very serious attention to potential health and safety risks. But perhaps the most important factor is that this project was genuinely wanted by both government and non-government agencies in the host country from the start: Indeed, this

has never been 'FFI's project', but rather an Antiguan initiative that FFI is assisting. Having strong national ownership has enabled the project team to secure permits and overcome what could have been insurmountable obstacles, such as the complicated import of over 2.5 tonnes of rodenticide. For other Darwin projects that are planning to tackle invasive alien species, it may be advisable to delay the actual eradication operation to the second or even third year until and unless the team is confident that such support is already in place.

Despite careful planning, not everything worked to plan. For example, the livestock spear gates we shipped from Australia to form the self-mustering corral on Redonda proved futile: It seems it never occurred to these goats to push the gates to gain entry to the corral (probably because they had never needed to push through vegetation or other obstacles on the denuded island!). With hindsight, we should have spent more time studying the goats and testing a variety of capture methods in advance, because they did not behave as other feral goats have done on other islands. We also learned that even good quality tents cannot survive more than two months on Redonda without being destroyed by UV light and the scouring action of wind-blown volcanic dust. We experimented with rigging up shade cloths and screens to shield the tents, but these did not last long. Additional funds have therefore been sought to replace at least some of the tents that were destroyed in Year 1. Another more stressful complication was the fall in the pound sterling: By Q3, the Darwin grant was worth around EC$220,000 (US$82,300) less than originally budgeted. Our request to Darwin Initiative for an emergency top up was rejected. The Project Leader and our colleagues therefore had to worked very hard to raise additional funds, even at the height of the busy eradication operations. Fortunately we were able to secure additional funds in the nick of time, but in hindsight, we should have requested a larger grant and/or indicated the exchange rate as an assumption on the log frame.

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

The letter confirming the approval of the grant no. 23-003 included the comment: "currently few of the indicators have baselines - these will need to be added to allow verification of evidence presented in the first Annual Report." Baselines have been appended to the log frame in Annex 2, most of them taken from the pre-project report that was cited several times in the proposal: Bell, E.A. & Daltry, J.C. (2012) *Feasibility Study for the Eradication of Black Rats* Rattus rattus *From Redonda, with New Observations on the Island's Biodiversity and Ecology*. WMIL and FFI, Offshore Islands Conservation Programme, St John's, Antigua. Https://www.researchgate.net/publication/274456832_Feasibility_Study_for_the_Eradication_of_Black_Rats_Rattus_rattus_from_Redonda_with_New_Observations_on_the_Island%27s_Biodiversity_and_Ecology

11. Other comments on progress not covered elsewhere

The project's strategy and work plan have not fundamentally changed, and we anticipate continuing to work according to the original log frame unless there is a major setback (e.g. the discovery of rats on Redonda that survived the eradication operation is very unlikely but would necessitate immediate action). As part of Output 3, however, we have identified the need to conduct marine surveys to justify the inclusion of the seas around Redonda in the new protected area, to ensure the integrity of the whole ecosystem from ridge to reef. Preliminary marine surveys were conducted by the DoE and marine biologists from Waitt Foundation in Q3, and we are now planning to build on this baseline with more extensive surveys with Fisheries Division and other partners. We have also learned of the value of conducting more archaeological surveys of the historical buildings, artefacts and middens on Redonda, because these will also help to justify the protection of this island and help inform its management. The National Parks Authority is represented on the Project Steering Committee and has already provided skilled archaeologists to conduct a preliminary appraisal of Redonda. Further research is planned in Year 2. As the marine and archaeological surveys were not planned or budgeted for under the Darwin proposal, however, other funds have or will be secured for these.

12. Sustainability and legacy

The project is becoming widely known in Antigua— especially the goat rescue operation under Output 1— and all of the persons we spoke to in Montserrat had also heard about it by Q4. This

is probably largely thanks to the project press release, local media interviews and word-of-mouth. The public survey in Year 1 revealed many misconceptions about Redonda, however, so more concerted work must take place under Output 4 in Years 2 and 3 to raise awareness of the true nature of Redonda and hence this project. The first open access publications from this project have been produced (Table 2), and more will follow in Years 2 and 3, focusing on the methods used to remove invasive species and the responses of native wildlife.

The project's exit strategy is still valid. The permanent removal of invasive alien rats and goats (Output 1), funded by Darwin, will surely be the greatest legacy from this project, having been the biggest threats to biodiversity. Their swift elimination should enable the recovery of wildlife and ecological processes on this severely degraded and unique site. Thanks to Redonda being very remote, uninhabited and difficult to access, the risk of re-invasions by these or other alien species is very low and should be relatively easy to manage through the systems established by Activity 1.4. That said, we do not envisage this project and its partnerships coming to an abrupt halt at the end of Year 3, but rather entering a new phase when the Antiguan partners may develop further conservation activities with technical assistance from FFI, such as the reintroduction of burrowing owls, iguanas and other keystone species, and even designate Redonda a mixed natural and cultural World Heritage Site. Such needs and opportunities can be explored during the development of the management plan in Year 3 (Activity 3.4).

13. Darwin identity

The Darwin Initiative name and, where appropriate, logo has been used extensively, including on the widely disseminated international media release in Q2, on all project reports, and other project documents such as agendas and minutes of Steering Committee meetings. Wherever possible, we have included the full clause "with support from Darwin Initiative through UK Government funding". Stickers with the Darwin logo have also been fixed to all equipment purchased using grant funds, including the project laptop, GPSs, walkie-talkies, etc. The project is well understood by the host organisations and other participating organisations to be a UK Government-funded project, and that the Darwin Initiative is the single largest funding source. However, we recognise that more needs to be done to increase the project's presence on social media and to link this to the Darwin Initiative's social media channels.

14. Project expenditure

Table 1: Project expenditure <u>during the reporting period</u> (1 April 2016 – 31 March 2017)

Project spend (indicative) since last annual report	**2016/17 Grant (£)**	**2016/17 Total Darwin Costs (£)**	**Variance %**	**Comments (please explain significant variances)**
Staff costs (see below)			0.5	
Project Leader: Dr Jenny Daltry			-7.9	
Project Coordinator: Ms Shanna Challenger			9.5	
Finance Administrator: Ms Mary Rider/ Ms Isabel Vique			12.7	Underspend due to Mary Rider's resignation from FFI in December 2016 and replacement by Isabel Vique in 2017. Darwin notified of change of personnel.
Community Liaison: Ms Natalya Lawrence			-0.6	
Wildlife Officer: Ms Andrea Otto			3.1	
Biosecurity Officer: Mr Tahambay Smith			-8.1	

Project spend (indicative) since last annual report	2016/17 Grant (£)	2016/17 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Biosecurity Officer: Mr Sean Lee			-8.1	
Rat Eradication Team Leader: Ms Elizabeth Bell			-12.1	Increased cost due to fall in value of pound by the time the project started
Consultancy costs			-6.8	
Overhead Costs			0.4	
Travel and subsistence			-9.9	
Operating Costs			6.0	
Capital items (see below)			-8.2	
Camping gear			-15.3	Increased due to fall in value of pound. Not discussed with Darwin because total cost of capital items remained within 10% margin.
Laptop computer for coordinator			-55.0	Increased due to fall in value of pound and, having seen impacts on other field equipment, the necessity of laptop with exceptional resistance to high temperatures, dust and possible shocks in the field.
Goat corral (fencing)			-3.9	
GPS (Garmin etrex) x 9			8.3	
Abseiling equipment (including ropes and PPE)			9.3	
Digital cameras (waterproof)			-14.5	Increased due to fall in value of pound. Not discussed because difference was small and the total cost of capital items remained within 10% margin.
First aid kits			0.4	
Others (see below)			-0.5	
Monitoring and Evaluation			-2.1	
Other consumables			3.6	
TOTAL				

Annex 1: Report of progress and achievements against Logical Framework for Financial Year 2016-2017

Project summary	Measurable Indicators	Progress and Achievements April 2016 - March 2017	Actions required/planned for next period
Impact **Significant recovery and regeneration of threatened species and habitats on Redonda is a source of national pride and directly informs and inspires other Caribbean nations to eliminate harmful invasive species.**		Early signs of recovery, at the end of Year 1, include the arrival of a bat, shearwaters and several land bird species for the first time in many years on Redonda. The rat eradication and biodiversity monitoring methods from this project are already being emulated by other projects; including the Darwin Plus project DPLUS060 in Anguilla.	[redacted]
Outcome **The permanent removal of harmful invasive species triggers the recovery of endemic species, habitats and ecological processes on Redonda, and enhances Antigua & Barbuda's natural capital and conservation capacity.**	0.1 No invasive vertebrates remain on Redonda by project end. 0.2 Net increase by at least 10% in abundance of fast-breeding native species by Year 3. 0.3 Net increase by at least 10% in vegetation cover by Year 3.	0.1 Good progress was made in Year 1 to remove all invasive vertebrates (rats and goats). Absence to be verified in Years 2 and 3. 0.2 Increases are to be quantified with monitoring in Years 2 and 3. 0.3 Increases are to be quantified with monitoring in Years 2 and 3.	Island-wide surveys will be conducted in Year 2, along with implementing the biosecurity system (activity 1.4) throughout Years 2 and 3 to verify no rats and goats remain. Monitoring of biodiversity will continue through Years 2 and 3 under Output 2, and any significant changes measured against baseline data from Year 1 (or pre-project data where applicable).
Output 1. Alien invasive vertebrates (rats and goats) successfully removed from Redonda, with systems in place to prevent (re)invasions.	1.1 No goats on Redonda by end of Year 1. 1.2 Rare breed goats from Redonda housed on enclosed government farmland on Antigua by end Year 1. 1.3 No rodents on Redonda by end of Year 2.	The original indicators still appear valid and useful, with only one change advised (to indicator 1.1). The following progress was made in Year 1: 1.1 Excellent progress was made in Year 1 to remove the goats. As we have learned that the smaller goats can be surprisingly difficult to see, however, their absence cannot truly be confirmed until Year 2 (Section 3.1, Activity 1.2). We therefore propose changing this indicator to "No goats on Redonda by end of Year 2". 1.2 Over 40 goats are now housed at the fully enclosed Veterinary & Livestock Division facility on Antigua (see Section 3.1, Activity 1.2). 1.3 The rat eradication operation in Year 1 also appears to have been fully successful, but this indicator will be verified with further surveys in Year 2 (see Section 3.1, Activity 1.3).	
Activity 1.1 Complete Operational Plan and SOPs to remove goats and eradicate rats.		Completed. Operational plans for removing the feral goats and for eradicating rats, as well as associated SOPs, were produced in Q1 and Q2. The main technical reports are: Campbell, K. *et al.* (2016) *Redonda Feral Goat Rescue: Operational Plan*. Report from Island Conservation to the Redonda Restoration Programme; Bell, E.A. & Daltry, J.C. (2016) *Operational Plan for the Eradication of Black Rats* Rattus rattus *From Redonda (Antigua and Barbuda).* Redonda Restoration Programme; and Bell, E.A	

Project summary	Measurable Indicators	Progress and Achievements April 2016 - March 2017	Actions required/planned for next period
		(2016) *Health and Safety Plan for Fieldworkers on Redonda.* Redonda Restoration Programme, St John's, Antigua. See section 3.1, Activity 1.1.	
Activity 1.2 Capture and transfer goats from Redonda to enclosed government farmland on Antigua.		Completed. Over 40 goats were captured alive on Redonda in Q3 and Q4. Unweaned kids were hand-reared by local veterinarian Dr Fiona Francis while the rest were transferred to the new Veterinary and Livestock Division facility on Antigua. Animals that could not be moved (e.g. old males in obviously poor health) were humanely shot, with permission. Mr Haverson will conduct a final search of Redonda for at least 10 days in Year 1, but we believe no goats remain to be moved. See section 3.1, Activity 1.2, and images in Annex 4.	
Activity 1.3 Establish baiting grid on Redonda and eradicate rats.		Completed. A grid of 469 bait stations was established at 30-m intervals across all accessible areas in early Q4. Klerat bait was deployed across the island for 7 weeks in the bait stations and by aerial drops from helicopter in areas that could not be accessed safely. The last two known rats on Redonda were detected (and killed) in the second week of March 2017. Section 3.1, Activity 1.3, and Annex 4.	
Activity 1.4 Establish biosecurity surveillance system to prevent incursions, and monitor Redonda every 2 months to verify no invasive vertebrates remain.		Underway. Ahead of schedule, 39 permanent bait stations were installed on Redonda at the end of Q4 to help detect and kill rodents. Other aspects of the biosecurity system will come into effect in Year 2. See section 3.1, Activity 1.4.	
Activity 1.5 Publish technical report(s) detailing the methods, results and any lessons learned from Output 1.		Underway. The project has produced a suite of illustrated technical progress reports, including weekly reports from the rat eradication operation. The final technical reports on the goat removal operation and the rat eradication operation will be completed in Year 2. See section 3.1, Activity 1.5.	
Activity 1.6 Incorporate biosecurity system into the costed management plan for Redonda (re: 3.4).		To be conducted in Year 3 (with activity 3.4).	
Output 2. Monitoring system established to measure the responses of fauna, flora and ecological processes to the removal of alien invasive vertebrates.	2.1 Rapid methods devised and established for monitoring short- and long-term changes in major taxa and abiotic characters (in Year 1, tested and refine by Year 3). 2.2 Status of major taxa and abiotic characters monitored as per 2.1 before and after removing the goats and rats (every year).	The original indicators still appear valid and useful. The following progress was made in Year 1: 2.1 Rapid methods were developed in Year 1 (see section 3.1, activities 2.1.), and will be re-evaluated and refined in Years 2 and 3. 2.2 The first round of surveys was conducted in Year 1 and these data, together with some pre-project survey data, provide the baseline for monitoring changes (see section 3.1, activity 2.2).	
Activity 2.1 Project scientists design and agree standardised methods to monitor birds, reptiles, bats, invertebrates, plants, soil and microclimate.		Completed. Methods were developed in consultation with local scientists, and are being refined under Activities 2.2 and 2.3. A manual of methods is under development (75% completed). See section 3.1, Activity 1.1 and images in Annex 4.	

Project summary	Measurable Indicators	Progress and Achievements April 2016 - March 2017	Actions required/planned for next period
Activity 2.2 Conduct monitoring as per 2.1 during the grant period (before and after removing the goats and rats).		Underway. Using standardised methods (2.1), data were collected on the diversity and abundance of birds, reptiles, invertebrates (terrestrial and marine), plants and reef fish. Samples were collected of the island's soils and data loggers installed to monitor microclimate. Monitoring will continue through Years 2 and 3.	
Activity 2.3 Finalise manual detailing the monitoring methods, incorporating lessons learned from 2.2.		The manual is expected to be finalised in Year 3, as planned.	
Activity 2.4 Publish technical reports detailing the results and lessons learned from Output 2.		Ongoing. The first open access, peer-reviewed publications from Redonda are detailed in Annex 3, Table 2. Key technical reports produced under Activity 1.1 will also be copy-edited and shared online in Year 2, and others are intended to follow (e.g. the final technical reports on the rat eradication operation and removal of goats).	
Activity 2.5 Incorporate ecological monitoring plan into the costed management plan for Redonda (re: 3.4).		To be conducted in Year 3 (with activity 3.4).	
Output 3. Redonda becomes a protected area in accordance with the Sustainable Island Resource Management Zoning Plan for Antigua & Barbuda, with an effective structure to manage its ongoing ecological recovery and sustainable use.	3.1 Management committee established and operational by end Year 2. 3.2 Redonda designated as an Environmental Protected Area, encompassing the land and surrounding sea by end Year 2. 3.3 Management plan prepared (Year 3).	The original indicators still appear valid and useful, but only preparatory work was carried out for this output in Year 1. As a precaution, we propose editing one indicator (3.2), to help allow for possible delays in the new protected area being designated: 3.1 The protected area management committee has not been formally established yet. However, the Project Steering Committee has been established and is working well, and could potentially form the basis of the management committee. 3.2 Redonda has not been designated a protected area yet, but the data and awareness generated in Year 1 will help support this process in Year 2. We propose changing the indicator to "Redonda designated as an Environmental Protected Area, encompassing the land and surrounding sea by end Year 3" because even though developing the technical proposal will be a major focus of the project team's combined efforts in Year 2, we may have little control over how long it will take for the proposed protected area to be approved through Cabinet. 3.3 It is too soon to prepare the management plan, but data and consultations from Year 1 will help inform the plan (Year 3).	
Activity 3.1 Complete stakeholder consultations in Antigua and Montserrat.		Completed/ Ongoing. The project team has conducted three visits to Montserrat to date and held numerous small and large meetings with stakeholders on Antigua. The consultations have been very informative and positive. See section 3.1, Activity 3.1. The work plan in the proposal was misleading in that it indicated consultations would cease after Year 1. In fact, this ought to be an ongoing activity, to help foster support for protecting Redonda (Activity 3.2) and to engage stakeholders in the management planning process (Activity 3.4).	

Project summary	Measurable Indicators	Progress and Achievements April 2016 - March 2017	Actions required/planned for next period
Activity 3.2 Prepare and submit technical proposal to Cabinet to designate the Redonda Environmental Protected Area (EPA).		To be conducted in Year 2. Note that the Project Steering Committee still anticipates the island will be designated an EPA, but there is a slim possibility it may be designated under alternative legislation (e.g. as a National Park). The DoE is presently involved in developing the national protected area systems plan, which will help to clarify the legislation this site is to be protected under.	
Activity 3.3 Quarterly management meetings of the Redonda EPA Management Committee.		The Management Committee is to be formed towards the end of Year 2. This may well be modelled on, even directly evolve from, the Project Steering Committee that was established in Year 1. The latter includes senior representatives from all of the government agencies and NGOs that are likely to be involved in managing Redonda.	
Activity 3.4 Develop a costed 10-year management plan for the protected area using a participatory process.		To be conducted in Year 3 (with activity 1.6). In the meantime, data gathered under other project activities (e.g. 2.3, 3.1) will help to inform the plan	
Output 4. National capability to plan, manage and implement and monitor invasive species projects is raised, supported by enhanced technical skills and greater public awareness and cooperation.	4.1 At least 20 persons from Antigua trained on invasive species control and apply their skills towards Output 1 (by Year 2) 4.2 At least 20 persons from Antigua trained on ecological monitoring and apply their skills towards Output 2 (by end Year 2). 4.3 At least 1 local student studies Redonda for postgraduate degree (Years 2 and 3). 4.4 At least 5 persons from Antigua gain increased skills and experience in managing projects and conservation sites (by Year 3). 4.5 At least 75% of Antiguans, Barbudans and Montserratians know about the project and are able to explain why Redonda merits conservation (end Year 2).	The original indicators still appear valid and useful, and some preparatory work was carried out in Year 1: 4.1 20 Antiguans government and NGO technicians participated in the removal of goats and/or rats in Year 1 (see names in Section 3.1, Activity 4.4). 4.2 More than a dozen Antiguans were involved in designing the monitoring programme in Year 1, with technical support from FFI. Four persons actively participated in surveys. 4.3 Not started yet, but at least 2 postgraduate scholarships have been offered for West Indian students to study Redonda, focusing on the ecological impacts of removing invasive mammals 4.4 The Project Coordinator in particular has gained vastly increased skills and experience in project management thanks to this project in Year 1. More management training will be provided in Years 2 and 3. 4.5 Based on the questionnaire survey conducted in Year 1, most persons know very little about Redonda. Far fewer than half were aware it has endemic reptiles, for example, or supports breeding colonies of the national bird (the magnificent frigatebird). We can safely assume 0% of the population knew of this project prior to 2016. Knowledge of the island, and of this project, will be tested again in Year 2.	
Activity 4.1 Plan multi-media campaign to communicate project to the public on Antigua and Barbuda and neighbouring states.		Completed. The project's communication strategy was developed through a 2-day workshop with local stakeholders in May 2016, and the messages were refined through a questionnaire-based survey of local knowledge and attitudes towards Redonda (See Section 3.1, Activity 4.1).	

Project summary	Measurable Indicators	Progress and Achievements April 2016 - March 2017	Actions required/planned for next period
Activity 4.2 Implement campaign, including media releases, signage and phone-in radio shows, and evaluate impact on public.		Ongoing. Actions in Year 1 included a joint media release and various articles in the local press, national television interviews, signage on Redonda, and public meetings. To date the feedback received has been overwhelmingly positive and supportive (See Section 3.1, Activity 4.2).	
Activity 4.3 Analyse training needs of field personnel.		Ongoing. Training needs have been informally assessed by the team leaders working alongside less experienced personnel (See Section 3.1, Activity 4.3). We hope to conduct a more comprehensive training needs assessment in Year 2, to help pinpoint the local needs and to help us to evaluate the impact of the training (Activity 4.7).	
Activity 4.4 Conduct training classes and on-the-job mentoring for local personnel participating in eradication and biosecurity activities (re Output 1).		20 Antiguans government and NGO technicians participated in the removal of goats and/or rats in Year 1 (see names in Section 3.1, Activity 4.4). Further training is planned in Year 2, focusing on biosecurity to prevent incursions. (See Section 3.1, Activity 4.4).	
Activity 4.5 Conduct training classes and on-the-job mentoring for local personnel participating in biodiversity monitoring (re Output 2).		More than a dozen Antiguans were involved in designing the monitoring programme, with technical support from FFI. Four persons actively participated in surveys in Year 1. Further training and fieldwork will be among the project's top priorities for Year 2. (See Section 3.1, Activity 4.5).	
Activity 4.6 Local technicians participate in project meetings and key field activities with FFI training and mentoring where needed.		In total, at least 30 local persons participated in project management and implementation in Year 1, including 16 Antiguans on the Project Steering Committee (closely involved in most aspects of project planning and evaluation). The Project Coordinator in particular has gained vastly increased skills and experience in project management. More management training and opportunities for fieldwork will be provided for local technicians in Years 2 and 3. (See Section 3.1, Activity 4.6).	
Activity 4.7 Evaluate impact of 4.4–4.6 on the competences of local personnel in government and NGO sectors.		To be conducted in Year 3.	
Activity 4.8 Student research on Redonda's biodiversity and management for postgraduate degree(s).		To our knowledge, two postgraduate scholarships are being offered for students to study Redonda, focusing on the ecological impacts of removing invasive mammals. It is likely that at least one of these will commence in Year 2.	

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

Project summary	Measurable Indicators[a]	Means of verification	Important Assumptions
Impact: Significant recovery and regeneration of threatened species and habitats on Redonda is a source of national pride and directly informs and inspires other Caribbean nations to eliminate harmful invasive species.			
Outcome: The permanent removal of harmful invasive species triggers the recovery of endemic species, habitats and ecological processes on Redonda, and enhances Antigua & Barbuda's natural capital and conservation capacity.	0.1 No invasive vertebrates remain on Redonda by project end. 0.2 Net increase by at least 10% in abundance of fast-breeding native species by Year 3.[b] 0.3 Net increase by at least 10% in vegetation cover by Year 3.[c]	0.1 Biosecurity monitoring datasheets and quarterly reports. 0.2 Biodiversity monitoring data and reports[1]. 0.3 Fixed point photographs and vegetation plots.	Recent scientific research is correct in identifying rats and goats as the primary drivers of biodiversity loss on Redonda, and that at least some of these changes are reversible if the aliens are removed.
Outputs: 1. Alien invasive vertebrates (rats and goats) successfully removed from Redonda, with systems in place to prevent (re)invasions.	1.1 No goats on Redonda by end of Year 1.[d] 1.2 Rare breed goats from Redonda housed on enclosed government farmland on Antigua by end Year 1.[e] 1.3 No rodents on Redonda by end of Year 2.[f]	1.1 Monitoring reports and site visits by project biologists and biosecurity personnel. 1.2 Photographs and stock books. 1.3 Monitoring reports and site visits by project biologists and biosecurity personnel.	Rats on Redonda are susceptible to the same bait and baiting methods that have been successfully used on other Caribbean islands. No unusual and severe weather events during critical stages (this project will avoid conducting important activities during the hurricane season, especially August through October).
2. Monitoring system established to measure the responses of fauna, flora and ecological processes to the removal of alien invasive vertebrates.	2.1 Rapid methods devised and established for monitoring short- and long-term changes in major taxa and abiotic characters (in Year 1, tested and refine by Year 3).[g] 2.2 Status of major taxa and abiotic characters monitored as per 2.1 before and after removing the goats	2.1 Biodiversity monitoring manual. 2.2 Data and annual monitoring reports.	Long term monitoring strategy accurately predicts the future human and other resources available to implement it.

	and rats (every year).[g]		
3. Redonda becomes a protected area in accordance with the Sustainable Island Resource Management Zoning Plan for Antigua & Barbuda, with an effective structure to manage its ongoing ecological recovery and sustainable use.	3.1 Management committee established and operational by end Year 2. 3.2 Redonda designated as an Environmental Protected Area, encompassing the land and surrounding sea by end Year 2. 3.3 Management plan prepared (Year 3).	3.1 Redonda Management Committee ToR and meeting minutes. 3.2 Official designation of the protected area. 3.3 Redonda Management Plan (to at least final draft form).	Continued cooperation among stakeholders. Government willingness to protect Redonda, in accordance with its own national land use plan and legislation.
4. National capability to plan, manage and implement and monitor invasive species projects is raised, supported by enhanced technical skills and greater public awareness and cooperation.	4.1 At least 20 persons from Antigua trained on invasive species control and apply their skills towards Output 1 (by Year 2).[h] 4.2 At least 20 persons from Antigua trained on ecological monitoring and apply their skills towards Output 2 (by end Year 2).[i] 4.3 At least 1 local student studies Redonda for postgraduate degree (Years 2 and 3). 4.4 At least 5 persons from Antigua gain increased skills and experience in managing projects and conservation sites (by Year 3). 4.5 At least 75% of Antiguans, Barbudans and Montserratians know about the project and are able to explain why Redonda merits conservation (end Year 2).[j]	4.1 Training workshop and field reports. Names of trainees participating in fieldwork. Self-assessment competence questionnaires by the trainees, and appraisals by trainers and field team leaders. 4.2 As 4.1. 4.3 Student research thesis/ theses. 4.4 Before and after self-appraisals by participating government and NGO staff. 4.5 Interviews of representative samples of general public (out of the total of approximately 90,000 on Antigua, Barbuda and Montserrat).	Trained expertise remains in Antigua & Barbuda and Montserrat. Increased knowledge results in positive attitudes and behaviours.

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

1.1 Complete Operational Plan and SOPs to remove goats and eradicate rats
1.2 Capture and transfer goats from Redonda to enclosed government farmland on Antigua.
1.3 Establish baiting grid on Redonda and eradicate rats.
1.4 Establish biosecurity surveillance system to prevent incursions, and monitor Redonda every 2 months to verify no invasive vertebrates remain
1.5 Publish technical report(s) detailing the methods, results and any lessons learned from Output 1.
1.6 Incorporate biosecurity system into the costed management plan for Redonda (re: 3.4)

2.1 Project scientists design and agree standardised methods to monitor birds, reptiles, bats, invertebrates, plants, soil and microclimate.
2.2 Conduct monitoring as per 2.1 during the grant period (before and after removing the goats and rats).
2.3 Finalise manual detailing the monitoring methods, incorporating lessons learned from 2.2.
2.4 Publish technical reports detailing the results and lessons learned from Output 2
2.5 Incorporate ecological monitoring plan into the costed management plan for Redonda (re: 3.4)

3.1 Complete stakeholder consultations in Antigua and Montserrat.
3.2 Prepare and submit technical proposal to Cabinet to designate the Redonda Environmental Protected Area (EPA)
3.3 Quarterly management meetings of the Redonda EPA Management Committee.
3.4 Develop a costed 10-year management plan for the protected area using a participatory process.

4.1 Plan multi-media campaign to communicate project to the public on Antigua and Barbuda and neighbouring states
4.2 Implement campaign, including media releases, signage and phone-in radio shows, and evaluate impact on public
4.3 Analyse training needs of field personnel.
4.4 Conduct training classes and on-the-job mentoring for local personnel participating in eradication and biosecurity activities (re Output 1)
4.5 Conduct training classes and on-the-job mentoring for local personnel participating in biodiversity monitoring (re Output 2)
4.6 Local technicians participate in project meetings and key field activities with FFI training and mentoring where needed.
4.7 Evaluate impact of 4.4–4.6 on the competences of local personnel in government and NGO sectors.
4.8 Student research on Redonda's biodiversity and management for postgraduate degree(s).

Other Project Management activities:-
X.1 Project inception meeting
X.2 Project Steering Committee established and meets regularly to oversee project activities
X.3 Project biannual reports/ donor technical and financial reports
X.4 Monthly financial accounts
X.5 End of project Audit

[a] The following notes have been inserted in response to the reviewer requesting more details of the pre-project baselines for the project indicators (see section 10). We recognise the importance of this request, but fear most of the following details are too cumbersome to insert into the log frame cells above. We welcome advice on whether presenting the information here is an acceptable solution:

[b] Comparisons will be made to the pre-project baseline data in Bell & Daltry (2012) which included: (i) Density estimates of the endemic Redonda ground lizard *Pholidoscelis atrata* (146.9 per hectare) and Redonda tree lizard *Anolis nubilus* (770.9 per hectare) obtained from point counts in the 'safe zone' at the top of the island; (ii) Total numbers of nesting seabirds (West Indian red-billed tropic bird: 30 pairs; bridled tern: 41 pairs; brown noddy: 31 pairs; brown booby: 774 pairs; masked booby: 164 pairs; red-footed booby: 150 pairs; magnificent frigatebird: 119 pairs); (iii) Total number of land bird species (2 species only) and pairs (peregrine falcon: 1 non-resident pair; and zenaida doves: 2 pairs). For invertebrates and other taxa that haven't been surveyed before, net changes in abundance and diversity will be measured by comparing samples from Years 1 and 3 (Activity 2.2).

[c] Pre-project satellite images and photographs show not more than 1% of the island has permanent vegetation cover (mainly trees *Ficus citrifolia* and small patches of cacti *Opuntia* spp. and *Aloe vera*), while ephemeral weedy herbs and grasses form a thin layer across 20% of the island after rain. Changes are to be measured by comparing fixed point photographs in Years 1 and 3 (Activity 2.2) and, if available, satellite images.

[d] Pre-project baseline of an estimated 62–65 feral goats present on Redonda (Bell & Daltry, 2012).

[e] Pre-project baseline of zero goats of this breed being kept on government land at the project start.

[f] Pre-project baseline of an estimated 5,500 black rats present on Redonda at the project start (Bell & Daltry, 2012, 2016).

[g] No previous monitoring programme was prescribed or implemented for any aspect of Redonda's biodiversity.

[h] At the project start, only five local persons (all affiliated to the EAG) were known to have had previous advanced skills and experience of conducting rat eradications and/or rodent biosecurity in natural landscapes.

[i] At the project start, around 8 persons (most of them EAG staff or volunteers) were known to have had previous advanced skills and experience of surveying and monitoring wildlife on offshore islands.

[j] Based on the questionnaire survey conducted in Year 1, most persons knew little about Redonda at the start of this project (e.g. far fewer than half were aware it has endemic reptiles, or supports breeding colonies of the national bird, the magnificent frigatebird). We can safely assume 0% of the population knew of this project prior to 2016.

Annex 3: Standard Measures

Table 1 Project Standard Output Measures

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
2	Number of people to attain Masters qualification (MSc, MPhil etc.).	tbd	Antiguan/ other West Indian	0			**0**	1
6A	Number of people to receive other forms of education/training: (*Includes coaching in project management, invasive species control and/or biodiversity monitoring)*.	9 female, 21 male	29 Antiguan,1 Vincentian [2]	30			30	30+
7	Number of different types of training materials to be produced for use by host country.	-	-	0			0	1
9	Number of species/ habitat management plans or action plans produced for implementing agencies in the host country. (*The biosecurity plan and management plan for Redonda).*	-	-	0			0	2
10	Number of individual field guides/ manuals to be produced to assist work related to species identification, classification and recording. (*The biodiversity monitoring manual plus associated field identification guides to the plants and animals of Redonda).*	-	-	0			0	3
11A	Number of papers to be published in peer reviewed journals (*Includes other peer-reviewed scientific publications with citations*).	-	-	2			2	4
11B	Number of papers to be submitted to peer-reviewed journals.	-	-	0			0	1
12A	Number of computer based databases to be established and handed over to the host country. (*Specifically, to the DoE and EAG*)	-	-	1 (bait station database)			1	3

[2] During Year 1, FFI contracted 8 international interns who also each spent a minimum of 5 weeks on Redonda and received advanced training on goat removal and art eradication techniques: 6 British (2 female, 4 male) and 2 Irish (1 female, 1 male).

Code No.	Description	Gender of people (if relevant)	Nationality of people (if relevant)	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
13A	Number of species reference collections to be established and handed over to the host country. (*Invertebrates, lichens and potentially others collected during monitoring*).	-	-	0			0	2
14B	Number of conferences/ seminars/ workshops attended at which findings from Darwin project work will be presented/ disseminated.	-	-	1 (*Regional workshop on IAS, Montserrat, 2016*)			1	4
20	Estimated value (£'s) of physical assets to be handed over to host country. (*That the project holds a detailed inventory of all equipment and consumables)*	-	-	£ 10,000 (*Camping equipment, computer, survey equipment, rodenticide, goat pens – purchased using Darwin grant and matched funding*)			£10,000	£10,000
22	Number of permanent field plots and sites to be established during the project and continued after Darwin funding has ceased. (*Permanent transects, plots, fixed point photographs, etc.*),	-	-	135			135	150
23	Value of resources raised from other sources (e.g., in addition to Darwin funding) for project work.	-	-	£202,669 (from *National Fish & Wildlife Foundation, Taurus Foundation, Global Wildlife Conservation, Disney Conservation Fund, private sponsors)*				£280,735+

Table 2 Publications

Title	Type	Detail	Gender of Lead Author	Nationality of Lead Author	Publishers	Available from
The IUCN Red List of Threatened Species: *Ameiva atrata*	Peer-reviewed science publication	Daltry, J.C. (2016)	Female	UK	IUCN	IUCN Red List of Threatened Species: http://www.iucnredlist.org/details/summary/50009685/0
The IUCN Red List of Threatened Species: *Copeoglossum redondae*	Peer-reviewed science publication	Daltry, J.C. (2016)	Female	UK	IUCN	IUCN Red List of Threatened Species: http://www.iucnredlist.org/details/summary/47102774/0

Annex 4 – supplementary material

Appended to this report are:-

1) List of Project Steering Committee members and their affiliations
2) A selection of photographs from Year 1
3) Project media release
4) Example weekly update from the rat eradication operation in Q4 (#1 of eight)

Reports and other materials mentioned in this report can be provided on request.

1) List of Project Steering Committee members and their affiliations

Name	Gender	Position	Institution	Nationality (Usual base)
Elizabeth 'Biz' Bell	Female	Senior Ecologist	Wildlife Management International Ltd (WMIL)	UK and New Zealand
Dr Karl Campbell	Male	Program Director	Island Conservation	Australia (Galapagos)
Shanna Challenger	Female	Redonda Programme Coordinator	Environmental Awareness Group/ Fauna & Flora International/ Department of Environment	Antigua & Barbuda
Dr Brian Cooper	Male	Head, Environment Unit Board Member	National Parks Authority Environmental Awareness Group (EAG)	UK and Antigua & Barbuda
Dr Jenny Daltry	Female	Head of Caribbean	Fauna & Flora International (FFI)	UK
Dr Tubal Edwards	Male	Chief Veterinary Officer	Veterinary and Livestock Division (VLD), Ministry of Agriculture	Antigua & Barbuda
Lennox Henry	Male	Animals Health Assistant	Veterinary and Livestock Division, Ministry of Agriculture	Antigua & Barbuda
Dr Helena Jeffery-Brown	Female	Technical Coordinator	Department of Environment (DoE)	Antigua & Barbuda
Astley Joseph	Male	Deputy Director	Department of Agriculture, Ministry of Agriculture	Antigua & Barbuda
Victor L. Joseph	Male	Seabird Monitor	Environmental Awareness Group	Antigua & Barbuda
		Science Teacher	Claire Hall Secondary School	
Natalya Lawrence	Female	Project Coordinator, OICP	Environmental Awareness Group	Antigua & Barbuda
Kevel Lindsay	Male	Consultant	(Independent)	Antigua & Barbuda
Adam Long	Male	Peak Area Access Officer Director	British Mountaineering Council (BMC) Access Techniques Ltd	UK
Tricia Lovell	Female	Senior Fisheries Officer	Fisheries Division, Ministry of Agriculture	Antigua & Barbuda

Name	Gender	Position	Institution	Nationality (Usual base)
Jedidiah Maxime	Male	Director	Department of Agriculture	Antigua & Barbuda
Dr Reg Murphy	Male	1) Director of Heritage 2) Secretary General	1) National Parks Authority 2) UNESCO, Antigua	Antigua & Barbuda
Andrea Otto	Female	1) Volunteer/ Field Biologist 2) Biology Teacher	1) Environmental Awareness Group 2) Claire Hall Secondary School	Antigua & Barbuda
Joseph Prosper	Male	Acting Director	National Archives	Antigua & Barbuda
Greg Scott	Male	Chief Pilot	Caribbean Helicopters Ltd	Canada (Antigua & Barbuda)
Tahambay Smith	Male	President	Environmental Awareness Group	Antigua & Barbuda
Sophia Steele	Female	Eastern Caribbean Project Coordinator	Fauna & Flora International (FFI)	St Vincent & the Grenadines (Antigua & Barbuda)
Adriel Thibou	Male	Senior Forestry Officer	Forestry Unit, Ministry of Agriculture	Antigua & Barbuda
Ashton Williams	Male	1) Board Member 2) Dive Operator	1) Environmental Awareness Group 3) Private company	St Kitts & Nevis (Antigua & Barbuda)

2) A selection of photographs from Year 1

Some of the Project Steering Committee members at the Project Inception Workshop in May 2016 (J. Daltry).

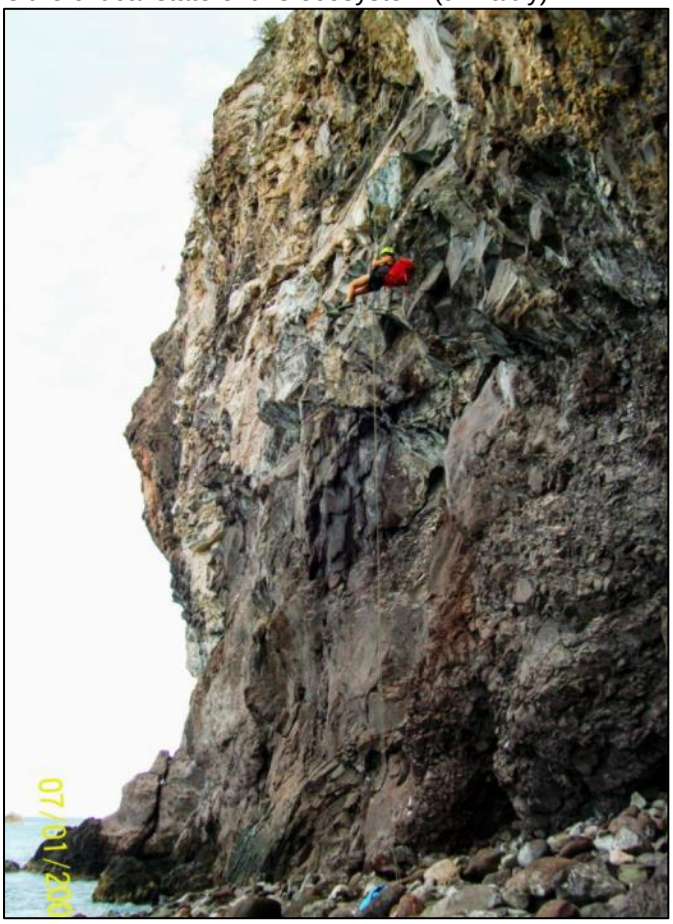
Redonda as seen from the air in Q3. Alien rats and goats have caused severe deforestation and erosion.

Project camp on Redonda. Few tents survived more than two months due to the UV and dust (J. Daltry, FFI).

A goat that starved on Redondae in January 2017; such is the critical state of this ecosystem (J. Daltry).

Corral constructed to catch and hold feral goats on Redonda before transportation to Antigua (S. Janzan).

Some of the bucks settling in at the purpose-built Veterinary & Livestock Division facility on Antigua.



British mountaineers abseiled down the 900-feet high cliffs to deploy bait and monitor rat activity (J. Stops).

A selection of photographs from Year 1, *continued*

Elizabeth Bell distributing bait from helicopter in areas too dangerous to access on foot (Silas Walton, FFI).

Camera trap showing five black rats taking turns to eat bait at a bait station in February 2017.

Aniseed-scented paraffin wax – one of many non-toxic tools to pinpoint any remaining rats (J. Daltry).

A permanent bait station, installed to help detect and prevent future incursions by rodents (Jack Ibbotson, FFI)

Project workshop to design biodiversity monitoring strategy and methods, November 2016 (J Daltry, FFI).

Masked boobies nesting on Redonda, December 2016 (Jeremy Holden, FFI).

Herpetologist Dr Anthony Herrel measuring a Critically Endangered Redonda ground lizard (Geoff Giller, Yale).

Shanna Challenger hosting a public meeting on the project, at the national museum in St John's (J. Daltry).

3) Project media release (July 2016)

Media Release **For immediate release**

Captivating Caribbean island to be given a new lease of life

Starving goats and predatory rats to be removed from Redonda to restore this Caribbean island to its former glory.

The Government of Antigua and Barbuda has announced plans to remove goats and invasive rats from its most rugged and remote offshore island to allow endangered wildlife and their habitats to recover. "I am immensely proud that my ministry has been a driving force in the development of this major initiative," says Honourable Molwyn Joseph, Minister of Health and the Environment. "Restoring Redonda to its full glory will be a great achievement for our country."

Redonda is home to a unique array of plants and animals, including rare lizards found nowhere else in the world[1]. The uninhabited and seldom visited island is also formally recognised as an Important Bird Area[2], supporting globally-significant numbers of seabirds.

However, the island's plant and animal populations are disappearing fast thanks in large part to its population of over 5,000 aggressive black rats (an invasive alien species) which prey heavily on the island's wildlife[3]. Together with the herd of long-horned goats that was brought to Redonda by humans more than a century ago, these mammals have transformed this once-forested island into a moonscape. So few plants survive that even the goats now face starvation.

Redonda is over 50 hectares in area and rises dramatically from the Caribbean Sea, 56 km south-west of Antigua. Goat skeletons litter the island, along with the relics of stone buildings from a guano mining community that lived here until the First World War[4]. With few trees left to stabilise the ground, soil and rocks continue to crumble into the sea, threatening nearshore coral reef in the waters below.

"We cannot stand by and watch as a part of our country, part of our history, disappears. We cannot be responsible for decimating animal populations on a regional scale," says local conservationist Natalya Lawrence of the Environmental Awareness Group (EAG).

The Redonda Restoration Programme has been formed by the Antigua & Barbuda Government and EAG in collaboration with partners from the UK (Fauna & Flora International, British Mountaineering Council), USA (Island Conservation) and New Zealand (Wildlife Management International Ltd).

One of the first steps will be to capture and move the remaining goats to Antigua, where they will be cared for by the Department of Agriculture.

"The goats are starving to death on Redonda and must be removed for their own sake," explains Astley Joseph, Deputy Director of the Department of Agriculture. "We believe it is important to rescue this rare breed because it could have useful drought-adapted genes that would benefit other herds on Antigua and elsewhere."

Rats will then be eradicated using a rodenticide bait that has previously been used to restore more than 20 other Caribbean islands without harming native wildlife. This is scheduled to be completed by mid-2017.

"We and other international organisations have offered our support because we recognise that this is a very challenging yet globally important initiative" says Sophia Steele, Eastern Caribbean Project Coordinator at Fauna & Flora International. "Recent studies have identified Redonda as the most important island to restore in the Eastern Caribbean due to its Critically Endangered wildlife and the high probability of lasting success."

The new programme is funded by the UK Government's Darwin Initiative, the National Fish and Wildlife Foundation, the Taurus Foundation and private sponsors. Additional technical and in-kind support is being provided by Caribbean Helicopters and Syngenta Crop Protection AG.

Dr Helena Jeffery Brown of the Department of the Environment says, "Antiguans and Barbudans will be proud as Redonda becomes a role model for regional biodiversity conservation. This will be yet another example of how this country is proactive in meeting the national and international commitments it has made to conserve biodiversity."

Antigua and Barbuda has a wealth of experience and success under the ongoing Offshore Islands Conservation Programme which has, since 1995, removed rats and other invasive pests from 15 islets closer to Antigua in the North East Marine Management Area. This has saved the Antiguan racer – once the world's rarest known snake – from extinction, and enabled an incredible recovery of other native animals and plants[5]. Many tens of thousands of residents and tourists now visit and enjoy Antigua's pest-free islands every year.

"I am most excited to see the progression of recovery on Redonda once the threat of invasive species is removed," says local biologist Andrea Otto, who will be part of the research team documenting the recovery process. "I want to see which types of vegetation

spring up first and which birds return. From what we have seen on the smaller islands we have restored, the transformation will be incredible."

- END -

High resolution images are available upon request. For more information and interviews, please contact:

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Notes to editors:

1 Redonda harbours a number of endemic species that occur nowhere else in the world, including at least five species of reptiles, such as the Redonda ground dragon (*Ameiva atrata*). In 2015 all of the surviving reptile species were evaluated by IUCN as Critically Endangered, meaning they face an extremely high risk of extinction in the wild.

2 Important Bird Areas are designated based on internationally agreed criteria and represent areas that hold the greatest significance for conservation of the world's birds. See http://www.birdlife.org/worldwide/programmes/sites-habitats-ibas. Redonda has regionally- and globally-significant colonies of seabirds, including brown boobies, masked boobies, red-footed boobies, magnificent frigate birds and red-billed tropicbirds.

3 The black or ship rats (*Rattus rattus*) that occupy Redonda are among the largest recorded members of this species, and have been observed hunting and killing the island's lizards and seabirds. Diet analyses have shown they also consume large quantities of plants and invertebrates.

4 Christopher Columbus named the island in 1493 and claimed it for Spain. Redonda was later transferred to the British Crown and around 7,000 tonnes of seabird guano was harvested annually from 1865 to 1914. It is believed that rats were introduced to the island during this period. The mining community was disbanded during World War I, after which the island was uninhabited. In 1967, Redonda became a dependency of Antigua & Barbuda.

5 The islands restored by the Offshore Islands Conservation Programme in Antigua's North East Marine Management Area support significantly higher densities of native plants, invertebrates and vertebrate animals than islands that still have rats. The recovery of Caribbean wildlife can be remarkably swift. For example, after removing black rats from Pelican Island in 2014, seabirds that had been absent for decades returned within the same year and the island's rare and endemic lizards more than doubled within 18 months.

4) Example weekly update from the rat eradication operation in Q4 (#1 of eight)

Redonda Restoration Programme: BLACK RAT ERADICATION
PROGRESS REPORT 1: Monday 13 to Monday 20 February 2017

Field Team:
Elizabeth (Biz) Bell, Jack Ibbotson, Adam Long, John Tayton, Bede West, Thea Eldred, Edward Marshall, James Stops, Silas Walton, Chris Clarke and Salina Janzan.

Antigua Team:
Shanna Challenger, Sophie Steele and Jenny Daltry.

Activities:

After a week on Antigua preparing for the black rat eradication phase of the Redonda Restoration Programme, the team headed to Redonda on Monday 13 February. It took eight helicopter flights to transfer all the people, water, equipment and food. Camp was established around the Manager's House – 12 tents for the team and equipment. The House was tidied up and is being used as the dining room, office and kitchen.

Figure 1. Bede, James and Adam on the cliff setting up bait points [Credit: Silas Walton].

Figure 2. Bede (yellow helmet, arrowed) on the descent to the coast while setting bait points [Credit: Silas Walton].

This week has been busy with establishing the bait station grid on the top of the island and the cliffs. The climber team (Jack, Adam, John, Bede, Silas, James and Thea) have been setting up routes and placing bait stations at 30 metre intervals wherever possible. There have been some challenging abseil and mountaineering routes established on the cliffs. Almost 70 bait points have been established on the cliffs.

Figure 3. Shanna necropsying a black rat [Credit: Biz Bell].

The ground team (Biz, Salina, Ed and Chris) set up 14 bait station lines on the top of the island, totalling just under 300 stations. A further 50 bait points have been put along the coast where access is possible. Shanna joined the team out on Redonda for three days (Friday to Monday) and assisted with the ground station checks.

The remainder of the island is baited from the helicopter. One aerial application of bait was completed on Friday 17 February.

The first bait check was completed on Sunday 19 February and almost all the bait stations had been completely emptied by rats.

Rat have been trapped around the house to provide samples for museums and universities; a total of 21 rats have been caught and dissected.

Comments and queries welcome: Redonda Restoration Programme Coordinator - Shanna Challenger
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Checklist for submission

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