

Darwin Initiative Main: Annual Report

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

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

Submission Deadline: 30th April 2024

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

Darwin Initiative Project Information

Project reference	29-003
Project title	Improving livelihoods and protecting biodiversity on Floreana Island, Galápagos
Country/ies	Ecuador
Lead Partner	Durrell Wildlife Conservation Trust
Project partner(s)	Island Conservation (IC); Fundación Jocotoco (FJ); Galápagos National Park Directive (GNPD), Galápagos Conservation Trust (GCT), Ecuadorian Ministry of Agriculture and Livestock, (MAG) Universität Wien (UW)
Darwin Initiative grant value	£498,076
Start/end dates of project	1 June 2022 – 31 March 2025
Reporting period (e.g. Apr 2023 – Mar 2024) and number (e.g. Annual Report 1, 2, 3)	1 April 2023 – 31 March 2024, Annual Report 2
Project Leader name	Jeff Dawson
Project website/blog/social media	https://floreanavuelveafloreceer.ec/index_en.php
Report author(s) and date	Jeff Dawson (Durrell), Paula Castaño, Lisa Kelly, Chad Hanson, Justin Lacy (IC), Victor Carrion (FJ), Sonia Kleindorfer (UW) April 16th, 2024

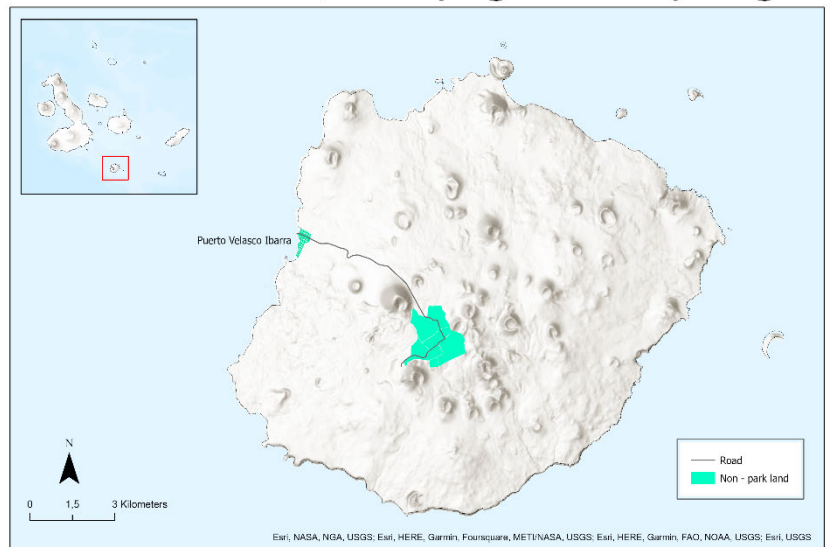
1. Project summary

The Galapagos Islands are renowned for Charles Darwin’s revelations and a convergence of unique wildlife that exist nowhere else in the planet, such as Giant Tortoises, Land Iguanas, Lava Lizards, Darwin’s Finches, the Galápagos Penguin, and many other endemic species. Unfortunately, invasive species are causing havoc across the archipelago by preying on these iconic and vulnerable native species.

The island of Floreana in particular has the most significant habitat degradation and highest level of species loss within the Galápagos archipelago, with 13 species that have been locally extirpated including the Floreana giant tortoises (*Chelonoidis niger*), Floreana mockingbird (*Mimus trifasciatus*), Floreana racer (*Pseudalsophis spp*), vermilion flycatcher (*Pyrocephalus nanus*) and Galapagos hawk (*Buteo galapagoensis*). The Floreana mockingbird, for example, was extirpated from the island due to these invasive species and survives only on two small predator-free offshore islets. Floreana is also home to 54 IUCN Threatened species that are threatened by the presence of feral cats and invasive rats and mice. Whilst feral cattle, donkeys, and goats have been eradicated, rodents and cats remain, threatening the survival of several remaining native species and limiting the populations of others.



Floreana Island, Galápagos Archipelago



A small but vibrant community of 140 people call Floreana home, and they rely on healthy ecosystems to support the island's primary industries including tourism, farming, and a small fishery. Unfortunately, invasive rodents also have an impact on community livelihoods and food security through crop destruction, consuming and contaminating stored food, and depredating poultry. They are also vectors of multiple diseases, contributing to reduced health, economic insecurity, and lost wages (Hopkins et al 2021, Morand et al. 2015).

Given these extreme challenges facing Floreana's ecosystems, wildlife, and its residents, the island has been identified as a priority conservation site within the archipelago. In response to the urgent need to support the community's holistic vision of a sustainable Floreana through restoration conservation activities, GNP, IC, and Durrell partnered to jointly advance this complex conservation operation on Floreana. The partners' shared goal is to restore the ecological integrity of Floreana Island, and these efforts build on the successful restoration of Rabida, Pinzon and other small uninhabited islands in the archipelago, which have resulted in the recovery of dozens of endangered species.

Durrell, IC, GNDP, and Jocotoco have been working very closely with the community to develop a strategy to advance sustainable agriculture, remove invasive predators, and reintroduce a host of threatened species. These include: the Giant Tortoise, Floreana Racer, Darwin's finches (4 spp.), Vermillion Flycatcher, Galápagos Rail, Galápagos Hawk, Galapagos Barn Owl, Lava Gull and the Floreana Mockingbird.

However, the restoration of Floreana is at its heart a community-driven conservation initiative designed to not only protect threatened wildlife but to protect the livelihoods of the community. This work includes preventing extinctions and reintroducing locally extinct species, improving livelihoods by improving the foundational resource for ecotourism, and increasing the sustainability of agriculture and farming.

Between October and December 2023 three island wide bait drops of brodifacoum were undertaken to eradicate invasive rats and mice from Floreana. Bait drops of PAPP to begin the eradication of feral cats was also undertaken. Post baiting monitoring is now underway to assess the effectiveness of the operation along with measures including trapping and hunting to remove the remaining feral cats.

This infrastructure put in place as mitigation for the baiting operation will subsequently aid long-term food security and native species reintroductions. Community livelihoods will be improved by activities in livestock feed production and improved harvest management.

Once these damaging invasive vertebrates are removed, the island's unique fauna and flora will have the opportunity to recover and flourish, creating the conditions for sustainable ecotourism and farming on the island, and thereby transforming the lives of Floreana islanders who are largely dependent on farm-based income and tourism. We have an incredible opportunity to replicate successes at scale to prevent further loss of biodiversity, lessen the impacts of climate change, and ensure sustainable livelihoods for those living on the islands. Lessons learned from Floreana will be disseminated to the wider conservation community and are applied to future ecological restoration of inhabited islands globally (e.g., Pitcairn, Juan Fernandez), preventing further extinctions of threatened biodiversity.

2. Project stakeholders/ partners

This project is part of the broader Floreana Island Restoration Programme led by GNPD with IC, Durrell, and GCT as long-term partners jointly committed to the vision of restoring the natural balance on Floreana to protect at risk native species and support sustainable livelihoods. As the project has progressed, new partners have become involved, such as Jocotoco who joined the effort in 2021 and is a core partner in this Darwin Initiative supported project.

In 2009, IC and GNPD began discussing the feasibility of removing invasive predators and officially began developing action plans in earnest starting in 2012, once the Floreana community had created its holistic vision of a sustainable Floreana. This community plan became the basis of the broader Floreana Island Restoration Programme and has remained the driving vision of the overarching project to this day. Since then, IC, now joined by Jocotoco, has been working with the Floreana community to implement sustainable livestock and agricultural practices to improve livelihoods and manage risk for their livestock during invasive predator eradication.

In 2017, the GNPD held a workshop (including IC and Durrell) to identify critical, at-risk non-target species in preparation for an invasive predator eradication operation and identified the necessary and appropriate mitigation measures required, and its these non-target mitigation measures that serve as the foundation for this Darwin Initiative sponsored project. Durrell led captive holding trials for the five finch species in question from 2018-2019, while IC led captive holding trails in 2019 for short-eared owls in question to determine the appropriate holding and husbandry protocols that ensure healthy populations could be held safely and securely.

Over the course of last year, the partnership has continued to strengthen with all partners equally committed to the successful implementation of this project, which is a critical component of the overall Floreana Island Restoration strategy. In July 2022 a 3 -day reintroductions workshop was held on Floreana to discuss the timelines and responsibilities for the reintroduction of 13 species onto Floreana following a successful eradication. This workshop, led by GNP and funded by Re:Wild brought together multiple organisations including Durrell, IC, Jocotoco, Universitat Wein (UW), Charles Darwin Foundation, Galapagos Conservancy, GCT, Massey University, University of Minnesota, Houston Zoo and the Floreana Community.

IC signed an agreement with UW for purchasing much needed innovation equipment (Wildlife Drones' system) that supported the post-release monitoring in early 2024 of finches placed in captive holding, and will support future reintroduction of up to 12 species locally extirpated.

Working closely with the Floreana community is critical for the successful delivery of this project as well as the overall Floreana Restoration Programme, and this support from the Darwin Initiative has made numerous community engagement efforts possible. These engagement opportunities have been crucial to ensuring we have a regular dialogue with community members and that our efforts are understood and welcomed. To date, through the property management agreements that outlined the action plan for ensuring the successful removal of invasive predators and mitigating any risk to pets and livestock was successfully implemented with all landowners on the island during the implementation of the rodent and feral cat removal.

A summary of the key project partners roles within this project are as follows:

Durrell: manage the Darwin grant and will lead the captive holding management of Darwin's finches during the invasive mammal eradication and oversee post-release monitoring. Will also lead on undertaking pre and post-eradication monitoring for key species groups including endemic reptiles, waterbirds and paint-billed crane.

Island Conservation: Lead the captive holding management of owls, oversee eradication implementation, and the pre and post-eradication monitoring of Galapagos petrels.

Galapagos National Parks Directorate: Overall programme lead including the rodent and feral cat eradication lead in-country and support captive holding, and post-release monitoring efforts.

Fundación Jocotoco: Lead relationships with Floreana community including the livestock and harvest management activities and lead eradication implementation.

Galapagos Conservation Trust: Will serve as funding partner to ensure the project can be implemented properly.

Ministry of Agriculture: Provide agricultural extension and support on crop and livestock production as needed.

Universitat Wien: Support post-release monitoring of Darwin finches and lead nest treatment activities for medium tree-finch.

In addition, the implementation of the project over the years has been supported by local stakeholders such as the local Government of Floreana, which is the local government, Asociación Verde Floreana, and the Galapagos Biosecurity Agency. Fundación Jocotoco has a full-time technician to provide assistance and community relations for each phase of the project. A communications plan for the Floreana Island Restoration Programme was finalized and led by GNPD, Jocotoco and IC.

3. Project progress

3.1 Progress in carrying out project Activities

Below we described our progress for Year 2 (1 April 2023 to 31 March 2024) of this project.

Output 1:

Activity 1.1. *Undertake full maintenance of aviaries, establish temporary owl enclosure on Floreana and purchase and install in the aviaries all necessary fixtures and fittings prior to capture of birds (finches and owls) and secured captive holding supplies (Y1).*

In April 2023, the installation of the ceiling mesh in the long-term owl captive-holding enclosures on Santa Cruz was completed. Additionally, we completed the installation of four guinea pig cages, as well as a wooden frame for mouse cages, providing a vivarium to hold live food for owls while in captivity. Additionally, we secured the remaining equipment and supplies needed for trapping and managing owls in captivity (see Appendix 2.1).

The maintenance and repair work on the finch aviaries that began in March 2023 was completed by early May, right on time to initiate Darwin finch captures on Floreana.

Unfortunately, Avian Influenza (AI) arrived on the Galapagos in September 2023. To minimize the potential for the wild birds to transmit the disease through faecal matter while perching on the ceiling of the owl infrastructure, we conducted additional fittings starting the last week of October. Funding for this was secured from Galapagos Conservation Trust. In March 2024, additional fittings to the owl aviaries were required to fix the water pipes for rainwater collection to prevent water from entering the aviaries due to the heavy rainy season.

Activity 1.2. *Work with Galapagos National Park Directorate (GNPD) to complete permitting requirements and secure permits to proceed with import of finch and owl diet supplies purchased overseas or in mainland Ecuador and proceed with project implementation (Q1 Y1).*

Permitting for all project activities are issued annually. Grant activities through end of April 2024 remained covered under current permits. The project team, in collaboration with Fundación Jocotoco, are actively renewing the permit through GNDP processes which will enable Y3 activities to be completed as well as all activities required by the general Floreana ecological restoration project. The GNDP has indicated that the subsequent year's permit would be ready and approved by May 1st, 2024.

Activity 1.3. *Capture requisite numbers of finches of each species from lowland and highland sites and bring into captivity following finch mitigation plan (May-September Y2)*

The target number of finches to be caught was 840 across all five species and both aviaries based on population viability analysis. However, 2023 was an El Niño year which in the Galapagos, is characterised by warmer, wetter weather on islands. Native fauna, in particular birds, have adapted to this natural event to maximise breeding resulting in a prolonged breeding season. On Floreana, breeding in finches and other land birds normally ends April to early May and the capture of finches was planned to start once this had finished in late May.

The issue with capturing birds in breeding condition is that there is a greatly increased risk of mortality due to their increased hormone levels reducing resilience to stress events (all wild birds have high levels of coccidiosis which can cause gut haemorrhaging under stress). Three trial captures were undertaken in late May but almost all birds caught were in breeding condition with high rates of mortality (over 20%). As a result, captures were paused for 4 weeks to increase chance of birds coming out of breeding condition. When resumed it was clear many birds are still in breeding condition. This meant we would be unlikely to capture the planned number of birds (due to time and actual numbers of suitable birds caught in nets) and had to refine the protocols to minimise stress further and minimise mortality. Following consultation with partners it was agreed to target a minimum number of 50 individuals per species (this is the minimum number to achieve generated in the Population Viability Analysis) and a focus was given to the ground and cactus finch as these are more at risk of eating the poison bait. It was also agreed with Galapagos National Park that overall mortality (capture and deaths in captivity) should be no more than 20% (original target 10%). Following this all captures meeting the new targets were completed mid-September (3 weeks before the first bait application) and the mortality rate was 14.8% (includes trial

captures). It should be noted that birds were still being caught in mid-September in breeding condition and with forming eggs.

In total as of the start of the baiting operation the aviaries held 524 birds - Cactus finch: 60; Small ground-finch: 199; Medium ground-finch 152; Small tree-finch: 63; Medium tree-finch: 50.

Activity 1.4 *Carry out daily husbandry (feeding, cleaning, health checks) on all finches held in captivity with weekly reports to Durrell (May-January Y2)*

Daily husbandry was undertaken by two teams supervised by Durrell's Floreana Mitigation Officer, Roland Digby. Teams consisted of 1 GNP ranger and 2 volunteers. In total 14 volunteers were required for the finch mitigation work with four on the project at any one time. Volunteers were predominantly international (we had one Galapagos volunteer for the last 2 months) and were a mix of highly experienced aviculturists, vets and graduates. In total 4 GNP staff were involved in the aviary work, with two working for 2 weeks before rotating.

All health data was inputted into an excel sheet that was shared with Durrell's UK and Jersey staff as well as key partners including veterinary staff.

Activity 1.5 *Undertake weekly maintenance checks and predator control at finch aviaries (May-January Y2)*

These were done as part of the work undertaken by the aviary teams detailed above.

Activity 1.6 *Once conditions allow and environment is safe, fit subset of finches with radio transmitters and release finches from aviaries (Q4 Y2)*

Bait degradation monitoring was undertaken by the baiting team to assess when any brodifacoum remaining in the environment had broken down and no longer posed a threat to the captive birds. In the highlands this was deemed safe for a trial release in mid-January and for the lowlands in mid-February.

A sub-set of 10 captive finches (5 medium tree and 5 small ground) were caught, fitted with VHF radio transmitter and released from the highland aviary on 19 January and tracked for 10 days by hand held receivers and by drone by researchers from UW

In the lowlands two trial releases were done due to the climatic conditions meaning bait was taking longer to break down. The first trial release of 15 small and medium ground-finch was undertaken on 5 February with a second release of 15 small and medium ground-finch on the 14 February.

Activity 1.7 *Undertake post-release monitoring of released finches (Y2 and Y3)*

The trial releases in both highlands and lowlands indicated that finches were behaving normally and suffering no mortality from residual bait. The full release of the remaining highland finches was undertaken on 1 February and in the lowlands on 22 February. Thirty further finches were tagged in the highlands prior to release and another 30 tagged in the lowland aviary prior to release. In total 100 captive birds were tagged for post-release monitoring.

Released finches were monitored by researchers from the UW with support from Durrell volunteers and GNP staff utilising both handheld receivers and yagi antennae and a drone fitted with a VHF receiver. Use of the drone enabled a much larger area to be surveyed over habitat that is inaccessible on foot unless trails are cut. Monitoring by radio tags ran until the end of March 2024.

Initial results show no mortality of any of the radio tagged finches. They also show many of the finches moving back to their original territories, setting up new territories and also breeding. This demonstrates that there has likely been negligible impact on their natural behaviour of holding the birds in captivity for over 6 months. Further post release monitoring in Y3 will be done via colour rings on the released birds legs.

Activity 1.8 *Recruit two local positions (veterinarian and mouse farm keeper) to support the captive owl programme (Q1 Y2).*

As per our HY report for Year 2 of the grant, we recruited for two positions (veterinarian and mouse farm keeper) to support the captive owl programme starting July 2023. The recruitment process for the mouse farm keeper was conducted locally in Galapagos with support Jocotoco. Although the hiring process was initially smooth, the selected person did not fulfil the needs of the role appropriately resulting in our inability to provide the owls with rodents and guinea pigs as a food source, as there was not sufficient increase in the rodent and guinea pig population to meet their dietary needs. Therefore, we instead recruited volunteers who have experience working with lab rodents, with the plan to provide a small stipend to cover food and lodging for volunteers with the allocated expenses for the mouse farm position. This was approved by Darwin Initiative through a Change Request (November 2023). This also included identifying the best path forward for the vivarium (additional details can be found within Activity 1.9).

For the veterinarian position, we determined that we needed to open the recruitment beyond the Galapagos Islands to ensure the needs of the project and skills required for this position were secured. This yielded positive results, as we were able to hire a wildlife veterinarian from Mexico who has ample experience with wildlife medicine and the captive holding of birds. Adding this person to the project team has resulted in positive benefits for the overall project. She not only provides exceptional care for the owls, but also supported the health management of Darwin finches while they were in captivity and supports the vivarium animals (rodents) as well as other components of the overall Floreana Island Ecological Restoration Project (e.g., pet management, non-target wildlife monitoring, and invasive species monitoring).

Activity 1.9. *Establish a rodent facility for producing rodents to feed owls during captivity (Q1 Y2) and conduct daily rodent husbandry (feeding, breeding, and cleaning) Q1 Y2 through Q4 Y3 and beyond.*

The establishment of a facility for producing rodents, which also included producing guinea pigs to feed owls during captivity, was completed in early July 2023. We had initially planned for this to be done in May. This activity was delayed since the contractors available on island to support this effort were busy with the construction of the piggeries and additional infrastructure (e.g., chicken coops) required for managing risk for livestock during the overall Floreana Ecological Restoration Project.

The breeding and establishment of rodent colonies and guinea pigs was very slow and did not yield the expected results to ensure rodents and guinea pigs were available for feeding the captive owls regularly. The person selected for establishing the vivarium and conducting daily rodent and guinea pig husbandry (as indicated under Activity 1.8) at the beginning of the effort did not meet the needs of the role and the responsibilities, which impacted the success of the initiative. To improve the success of the initiative we identified that the best path forward was to recruit national and international volunteers with previous experience on lab animal (rodent/guinea pig) breeding and care to lead the effort. This was put in practice in November with our first “rodent breeder” volunteer. To date we have had two rodent breeder volunteers and have secured the support of at least three more. Additionally, we determined that the focus of our rodent and guinea pig breeding program to feed owls will be shifted to breeding rodents (rats and mice) only from November 2023, as caring for the guinea pigs and the time required for them to breed (2 months vs 21-days for rodents) and produce enough individuals for owl feeding proved to be very long and time-consuming, reducing the possibilities of our effort to be successful.

To date, we have 120 rodents (rats and mice) in the facility and have initiated the breeding and establishment of colonies. Breeding is improving but continues to be slow. As such, the team concentrated over the last 4 months on implementing several adjustments related to diet, health (e.g., deworming), and stress management (e.g., heat, noise). Additionally, parallel to breeding rodents in captivity, the team is also trapping wild individuals from areas where rodenticides are not used to supplement the captive rodent breeding population and also to feed owls in captivity.

Simultaneously, owls are being fed day-old chicks (poultry) for the most part, which was included in the original feeding plan as an adequate food source. However, feeding day-old poultry chicks to the owls increases the cost of captive holding substantially by 50 – 60%. With the support and approval of the Galapagos Biosecurity Agency (who is responsible for approving the entry of this type of product into the archipelago) we approached chick incubators on mainland Ecuador to secure the donation of day-old chicks for the time owls will be in captivity. This donation was secured in December 2023 and since January 2024 we started receiving these donated day-old chicks. This still represents a cost for the project, related to logistics of transport of day-old chicks from mainland Ecuador to the Galapagos Islands, but reduces the monthly cost substantially approximately 65% from £0.87 to £0.31 per chick.

Activity 1.10. *Capture owls from Floreana island and hold them at a temporary captivity facility on Floreana until a sufficient number of owls are captured for transport to Santa Cruz where the owl aviaries are located (August-September Y2).*

From July 13 to September 4, we successfully captured 64 owls, exceeding the maximum target of 60 owls, which was the number considered by project partners as necessary number through population viability and genetic analysis, in large thanks to the assistance of the rangers from the GNP, volunteers from the University of Vienna, and the native species specialists from Island Conservation. In collaboration with the GNP and the Galapagos Biosecurity Agency, we transferred these owls from Floreana Island to Santa Cruz Island in a series of seven coordinated boat trips. The careful coordination of these boat trips played a crucial role in ensuring the well-being of the birds.

In October 2023, an additional owl found on the island exposed to the rodenticide used to remove invasive rodents was captured and placed under treatment for brodifacoum exposure. The bird was treated successfully for a month and then transferred from Floreana to Santa Cruz Island, with the owls maintained in captive holding. The bird is doing well and has no longer signs of exposure to anticoagulant rodenticides. Transportation of this owl was by helicopter, as it was available at the time in Floreana. With this owl, we currently have 65 owls in captivity on Santa Cruz Island. See Appendix 2.2

Activity 1.11. Carry out daily husbandry (feeding, cleaning, health checks) on all owls held in captivity with weekly reports to Island Conservation for the first 6 months (Q2 to Q3 Y2) and then monthly reports throughout the remainder of the captive period (Q4 Y2 to Q4 Y3 and beyond).

Every day, all aviaries are thoroughly cleaned, and the veterinarian conducts observations of all the owls. Each owl is provided with one or two one-day-old chicks, depending on the day of the week and the bird's needs. The owl team captures each bird every two or three weeks to conduct a thorough health check, including recording their weight. If required, treatment will be initiated by the vet and provided by her with the support of the park ranger and volunteers. Bi-weekly to monthly reports are provided to Dr Paula A. Castaño from Island Conservation as the Floreana Project Mitigation Manager and the in-country project manager for this Darwin Initiative project proposal.

The vet established a daily owl caretaking schedule to ensure consistency and smooth operations throughout the week while the park ranger and volunteers assisted in the caretaking duties. Once a week, we disinfect the aviaries using F10, and every other day, we clean perches, rocks, and the substrate, ensuring that the animals inhabit a clean and healthy environment. See Appendix 2.2

Activity 1.12. Finalise monitoring plans for 5 non-target species groups e.g., Darwin's finch; paint-billed crane; water birds; reptiles; Galapagos petrel (Y1).

As indicated in our Y1 Annual Report monitoring plans for the five non-target species groups have been completed and implemented. In addition to these species-specific monitoring plans, monitoring of how the terrestrial restoration efforts to remove invasive species will impact the surrounding marine ecosystems is being undertaken by IC and other partners (UC San Diego Scripps Institution of Oceanography and the Charles Darwin Foundation) through match funding from the Wolf Creek Charitable Foundation and Oceankind. See Activity 1.14 for details.

Activity 1.13. Train local GNP staff in monitoring techniques for key non-target species (Y1, Y2, Y3).

We provided training for to 6 GNP staff in monitoring techniques for owls during the capture and captive holding of these species in Y2. This included the use of radiotracking tools to locate some of the owls tagged early in 2023 by our partners at Vienna University, in addition to placing them in captivity. In January 2024, a GNP staff member trained previously in drone surveys served as a pilot in command for the vegetation and marine iguana surveys conducted in Floreana by Island Conservation.

Additional training to local staff from Fundacion Jocotoco and 2 DPNG staff has included the use of motion-sensing cameras for surveying predator activity, acoustic monitoring for landbirds and seabirds, point counts for landbirds, boat-based bird counts for seabirds, vegetation estimates applying several methodologies including photo-monitoring, drone surveys and soil and leaf sampling, and eDNA sampling of water. In January 2024, a GNP staff member trained previously in drone surveys served as a pilot in command for the vegetation and marine iguana surveys conducted in Floreana by Island Conservation.

Activity 1.14. Undertake pre- (Y1) and post-eradication (Q4 Y2 and Y3) baseline surveys of key non-target species.

[Redacted]

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Output 2:

Activity 2.1: *Carry out annual nest monitoring of medium tree-finch nests*

Undertaken by UW staff and volunteers from January to March 2024. 51 medium tree finch nests were monitored across two highland sites Cerro Pajas, Asilo de la Paz. In addition, 196 nests across 5 other species: 56 small tree finch, 56 small ground finch, 2 medium ground finch, 56 yellow warbler, and 26 cactus finch across two arid lowland sites and two highland sites. See Appendix 4.1

Activity 2.2: *Train local GNPD staff in nest treatment and monitoring protocols of medium tree-finch (Y1)*

Four GNPD staff were trained in various field work methods associated with short-eared owl trapping in July/August 2023.

Information on methods and success of nest spraying and nest material dispenser deployment was shared with both the GNPD and members of the public throughout the span of the project via meetings, including a community outreach presentation held on the 22 March. Not many GNPD staff joined the work due to other commitments with post-eradication monitoring. However four members of the team were Ecuadorian (Jefferson Garcia Llor, Katherine Alban Morales, Dominik Espinosa) and were trained in the activities conducted during the project. See Appendix 4.1

Activity 2.3: *Carry out nest treatment of medium tree-finch nests by GNP with support of Universitat Wien staff (Q4 Y1, Q4 Y2 and Q4 Y3)*

90 dispensers containing five types of material treated with 0.5% permecap: kapok, cotton fibre, sisal, feathers, and hemp were placed along study sites. 19 of 51 monitored medium tree finch nests (plus 3 small ground finch) were sprayed with 5 mL of 0.5% permecap during incubation on early feeding. See Appendix 4.1

Activity 2.4: *Data collection analysis, nest treatment and monitoring reports are completed by project partners (Q4 Y2 and Y3).*

Full data analysis is still being undertaken but preliminary results from the nest monitoring indicate that nest predation that reached the egg stage was 17 of 124 or 14% nesting mortality. This is a reduction from previous years where nesting mortality was 44.5%. The cause of most nest predation was likely smooth-billed anis (seen in area).

The nest treatment trials indicate a lower mean number of avian vampire fly (*Philornis downsi*) in nests using the treated materials from dispensers than nests without it that reached the chick stage (5.7 ± 2.2 cf. 14.4 ± 2.7). For nests that were sprayed, 14 were sprayed after eggs were laid (other lost to heavy rainfall or predated before spraying) and of those with known outcome 80% fledged (cf. 16% in previous years) and avian vampire fly density was lower in sprayed nests compared to unsprayed nests (2.6 ± 1.4 cf. 27.3 ± 6.0). See Appendix 4.1

Output 3:

Activity 3.1: Completed Y1

Activity 3.2: *Project partners (Jocotoco) will work with each farmer to set an irrigation system at each farm to support agricultural productivity*

Seven irrigation systems were acquired and installed for Floreana's agricultural producers in years 1 and 2, respectively, and are operating satisfactorily. Farms have utilized irrigation systems for short-term production during ENSO and dry seasons to supply local and tourism demand. See Appendix 3.1.

Activity 3.3: *Identify and recruit harvest and livestock management consultants to train Floreana community (Q1, Y1)*

Completed Y1

Activity 3.4: *Conduct in-farm training on the use of the new equipment, preparing nutritionally balanced, locally produced livestock feed, and managing crop harvests (Q3-Q4 Y1)*

Completed in Y1

Activity 3.5: *Floreana farmers implement livestock and harvest management practices learned during training, evaluate results and make necessary adjustments to ensure uptake of these techniques (Y2)*

Two further training sessions on swine and poultry management was undertaken in October 2023 which equipped the farmers with the necessary skills and knowledge to enhance their productivity and efficiency during and after the rodent and feral cat eradication phase. Appendices 3.2

During Y2, Jocotoco's technical team conducted two surveys with island producers to determine the number of farmers who have implemented and tested the new livestock feeding management practices (Appendices 3.3).

30 farmers were (17 M, 13 F) interviewed in Q2 survey of which all said they were implementing practices. In the Q4 survey 22 farmers (13 M, 9 F) were surveyed (8 were off island) with 17 (76%) stating they were implementing all practices and 5 (24%) implementing some. All farmers reported a 75% to 100% reduction in crop damage post eradication.

Regarding the training received 19 (86%) reported it was Good and 3 (14%) reported it as Fair due to the difficulty associated with implementing management practices rather than the effectiveness of the training.

Activities 3.6-3.7: To be undertaken in Y3

Output 4

Activity 4.1 – 4.3: Completed during Y1

Activity 4.5: *Floreana farmers implement livestock management practices learned during training to improve livestock production and manage risks (Y2 and Y3) with support of project partners.*

During Q3Y2, after the rodent eradication activities, we carried out new training for Floreana's farmers to reinforce their knowledge in management, feeding, diseases, and treatments in pig and poultry production and cattle feeding. Additionally, the Ministry of Agriculture and Livestock collaborate to manage possible risks and doubts, providing intensive monitoring and veterinary health care. This technical assistance has allowed local producers to implement this new production system smoothly over the last few months. (Appendix 3.2)

Activity 4.4: *Undertake baseline surveys of Floreana farmers current livestock and harvest management practices on Floreana Island and associated costs (Q1 Y1).*

As reported in Y1AR and Y2HYR the project will use the baselines from a comprehensive assessment undertaken in 2017 against which ongoing socioeconomic assessments of Floreana farmers will be assessed.

Activity 4.6 *Jocotoco, with support of external consultants and Floreana farmers, develop a manual of agricultural best practices for Floreana Island (Q1 Y2).*

The external consultants produced two manuals on the production and management of free-range chickens and swine during the training sessions with the island's producers.



Following the successful eradication activities in late 2023, our specialists are updating the manuals. These updates are specifically tailored to better align with Floreana's unique needs and environment, particularly in this new stage where the risk of rodents has significantly decreased. An updated version, fine-tuned to their requirements, will be available for distribution soon.

Activity 4.7 *Floreana farmers implement harvest management practices laid out in manual to reduce loss of produce from harvest to consumer (Y2 and Y3).*

Floreana's farmers over the coming months, will continue to implement the practices they diligently learned last year. It was a wise decision to refrain from starting new planting periods while there was still a significant presence of rodents.

Two manuals, each containing several modules, have been distributed to the island's producers. These forms are crucial tools to guide the sowing quantities and control the production of animals. For chickens, it's essential to record information related to feeding, egg production, feeding costs, supplements, inputs, etc. Similarly, for pigs, meticulous records are being taken for feeding, lactation, production records, and breeding, among other things.

The meticulous collection of all this information will serve as a valuable resource in year 3. It will enable us to conduct a comprehensive evaluation and determine whether the objectives of this output have been successfully met, thereby highlighting the crucial role of the producers in this process. (Appendix 3.2b and 3.2c)

Activity 4.8: To be undertaken in Y3.

3.2 Progress towards project Outputs

Below we described our progress for Year 2 (1 April 2023 to 31 March 2024) of this project.

Output 1 - *Six at-risk species successfully held in captivity (≥90% survival) during eradication of invasive predators from Floreana and impact of eradication on five key wildlife groups understood (pre vs post eradication surveys).*

In Y2 of this grant, we made significant progress towards Output 1. 65 Galapagos short-eared owls brought in captivity successfully prior initiating the dispersal of bait for removing invasive rodents and feral cats on Floreana Island. Additionally, one more owl was captured and successfully received treatment for managing its exposure to rodent bait. All owls maintained at present in captivity present an excellent health status, which has been possible by the joint efforts of the owl veterinarian, the Park rangers, the volunteers, and Dr Paula Castaño, the Floreana Project Mitigation Manager. The survival rate is currently 98.5% (one owl died due to attack by other owls at early stages of captivity). Monitoring of owls on Floreana is being undertaken to help determine when the owls can be released. Appendix 2.2

For the five species of Darwin's finch successfully held over the baiting operation and released in early 2024 the overall survival rate (from capture to release) was 82.2%. This higher than anticipated mortality is due to the increased mortality experienced at the initial capture phase (over 50%) due to the impacts of El Niño and the finches still breeding. A change in protocol greatly reduced this (c.11%) and a target for overall mortality of 20% was agreed with the GNPD, which was achieved.

Initial post release monitoring of finches has indicated no mortality. Follow up monitoring will be done in Y3.

Baselines for key non-target species groups were collected prior to the eradication with further baselines on marine ecosystems collected in 2023. Post-eradication surveys have and will be undertaken in Y3 to assess the impact.

Output 2 - *Conservation measures (invasive predator eradication and nest treatment) demonstrate a reduction in nest mortality for the Critically Endangered medium tree-finch by end of project*

Nest monitoring undertaken in Y2 has indicated a reduction in nest mortality (across all species) from the egg stage onwards from 44.5% to 14%, likely due to the removal of rats.

Treatment of medium tree finch nests by spraying suggest an 80% fledging success rate compared to 16% in previous years. Nests treated through spraying and or with treated nesting material show lower numbers of avian vampire fly compared to untreated nests (see Appendix 4.1)

Output 3 - *Floreana community (46% women) have increased self-sustainability in livestock management, animal feed production and harvest management and have shared lessons with 3 other islands/communities in Galapagos.*

During Y1, 39 people, including 20 women (51%), received training in animal food production. During Y2, 31 of these farmers received further training in harvest management and livestock production and started

implementing the practices learned; this made them self-sustainability because they knew how to prepare animal feed using local resources such as corn planted, sugar cane, and others. During Y3, strategies and lessons learned from Floreana will be transferred to other inhabited Galápagos islands (3 other islands), improving food security and household incomes across the archipelago.

Output 4 - Floreana community livelihoods become more resilient and food security improved through adoption of sustainable livestock management and improved harvest management practices by $\geq 75\%$ farmers and eradication of invasive rodents

Completion of all livestock infrastructure in Y2 including nine piggeries, fifteen chicken coops (including a dedicated area for chick handling), and seven cattle stables covering 100% of productive farms, a significant milestone that not only prepared Floreana for the baiting operation but has also strengthened the island's agricultural sector.

According to surveys 76% of Floreana farmers are implementing sustainable livestock management and improved harvest management practices, and 24% of farmers were motivated to intensify their production and apply 100% of the practices learned. All producers interviewed in Q4 reported a 75%-100% reduction in crop damage due to rodents.

3.3 Progress towards the project Outcome

Outcome: *At risk wildlife and livestock populations are effectively protected during the eradication of invasive predators from Floreana Island while vulnerable community livelihoods are strengthened through sustainable livestock management by 2025.*

Progress towards the Outcome is going well. Five species of finch have been successfully held and released (82.2% survival) and 64 short-eared owls (98.5% survival) remain in captivity (Indicator 0.1). Post eradication surveys for reptiles have been undertaken and results are being analysed (Indicator 0.2). 39 people on Floreana have been trained in various livestock and harvest management practices and are being provided ongoing technical support (Indicator 0.4) With the eradication undertaken in October to December 2023 and farmers reporting firsts such as undamaged avocados and germinating corn (unheard of in previous years) this bodes well for meeting Indicator 0.3.

3.4 Monitoring of assumptions

Project Outcome assumptions

Assumption 1: No extreme weather events (e.g., El Niño event) occur that may affect the removal of invasive predators on Floreana.

At the beginning of 2023, National Oceanic and Atmospheric Administration (NOAA) climate prediction centre modelling showed an increased possibility of an El Niño event for 2023/4 which began to materialize locally as a short a-seasonal window of precipitation in May. Extended forecasts suggested an increase in severity but with a large degree of uncertainty. As a result, conditions were monitored locally at the project site and precipitation was noted as wetter than an average year yet mild compared to regional predictions and experiences. The Floreana Project Steering Committee closely evaluated project risks associated with El Niño conditions, recognized project planning accommodated for a moderate amount of variability in weather and identified several mitigations to improve the likelihood of success including rodent population density assessments with thermal drones and supplementing the third bait application for a full island-wide coverage. Armed with this information, the committee collectively decided to proceed. Conditions remained relatively mild over the project's prescribed implementation window (October/November), a period of time that was selected to coincide with the dry season to minimize alternative food for rodents and ensure the typical breeding period for non-target species (e.g., Darwin finches) had passed. Fortunately, Floreana and its unique location within the archipelago and converging cold water currents continued to experience limited precipitation throughout the implementation period and the efforts to conduct the eradication remained on schedule. Bait dispersal initiated on time on 3 October 2023, and was completed in accordance with the plan.

Assumption 2: Enabling conditions to complete the project remain in place for the duration of the project (e.g., access to Floreana Island, interest, permission, and mandate from the local community remain in place).

Enabling conditions to complete the project remained in place through the implementation of the removal of invasive rodents and feral cats and continue today. Several mechanisms have been implemented to ensure access to Floreana Island; interest, permission, and mandate from the local community remain in

place. Additionally, we have secured all permits from the required authorities (e.g., GNPD) for implementing the activities established to be undertaken under this project and grant period.

Project Outputs assumptions

Assumptions Output 1:

Assumption 1. Enabling conditions to establish the infrastructure required are in place (e.g., access to Floreana Island and construction materials arrived from the mainland without any issues).

Enabling conditions (e.g., access to Floreana Island and construction materials from mainland Ecuador) were met for the short-eared owl's temporary and permanent aviary. However, we had some issues for the finch's aviaries that needed to be addressed before aviaries were operative to receive birds. Extension to the finch aviaries was made early in Y1. Still, we encountered issues with the mesh sourced that disintegrated in a couple of months. As such, we had to source the mesh again from a different vendor, which proved problematic due to a lack of availability. Finally, this issue was overcome, and the mesh arrived in early March 2023 and was installed on both finch aviaries in April, in time to receive the first set of finches in May 2023.

In September 2023, avian influenza was reported to have arrived in the Galapagos, although it has not reached to date Santa Cruz or Floreana Islands, it prompted immediate actions from the project team and partners to reduce any risk to the captive holding populations (e.g., Darwin finches and Short-eared owls). These included the implementation of more strict biosecurity protocols at each of the aviaries (on Floreana and Santa Cruz Islands) to prevent any exposure. It also required additional retrofitting of the short-eared owl permanent aviary on Santa Cruz Island to prevent any contact of wild birds with the captive owls. Funding for this was secured from Galapagos Conservation Trust and Fundación Jocotoco and the retrofitting was completed in November 2023. In March 2024, additional fittings to the aviaries were required to fix the water pipes for rainwater collection to prevent water entering the aviaries due to the heavy rainy season encountered this year. In all these instances the team was able to adjust quickly to the needs of the birds and coordinated with the contractors to get the retrofitting ready as soon as possible to minimize any impact to the captive populations.

Assumption 2. The tools and methods implemented will be effective to maintain a healthy captive population of Darwin Finches and short-eared owls and ensure their survival while in captivity.

A full finch-mitigation plan was finalised in 2021 following 2-years of captive holding trials. As indicated on our Year 1 report, in 2022, during a separate project (a translocation effort requiring captive holding for quarantine purposes), we had the opportunity to test our captive holding guidelines species, the woodpecker finch. This effort yielded successful results with zero mortality of woodpecker finches while in captivity, compared to previous experiences with the species that resulted in some instances of mortality >50%. Our results prove that these husbandry guidelines are transferable for future work with other Darwin finches and Floreana species requiring captive holding. The guidelines developed were implemented during the non-target mitigation work on Floreana in 2023.

However, due to the El Niño event causing an extension of the rainy season, and therefore, their breeding season in the wild increasing mortality they required some adjustments to ensure the adaptation of birds to captivity and their survival. This required our team to stop Darwin finch captures for at least three weeks in May/June to monitor the behaviour of wild populations and adapt our capture and captive holding strategy to ensure their adaptation and survival. As a result, it was decided in close collaboration with partners that we should focus on capturing the target numbers of those Darwin finch species (i.e., small ground finch, medium ground finch, and cactus finch) at higher risk of mortality during the rodent and feral cat eradication, and for those with lower risk (i.e., small and medium tree finches) reach at least the minimum numbers suggested by the population viability analysis conducted for the project. As such, on 15 September, we completed the captures of Darwin finches, which was just in time for the team to prepare for the bait application in early October. Although we had some mortality (approx. 17% overall – including capture, quarantine, and captivity in some cases up to 9 months) during the captive holding, the team was able to treat most of the individuals who presented health issues. In February 2024, the birds were successfully released back on Floreana Island, with some starting breeding upon release.

For owls, our tools and methods were developed and adjusted based on results obtained from captive-holding trials conducted with the species in 2019, which proved to be more successful for the species than on other occasions when the wildlife veterinarian from GNPD needed to conduct any housing or treatment of injured owls. To date (eight months after capture) these methods have proven to continue to be successful for holding 64 owls on Santa Cruz Island, with birds adjusting well to captive holding.

Assumption 3. The radio-tags deployed for post-release monitoring of Darwin finches work appropriately and remain in place (do not fall off the bird) for the duration of their battery life.

There were some initial issues with some tags falling off early (within a few days) despite the attachment method being used one that had worked in previous years. A slight adjustment to the attachment method (i.e. leaving some feather bases rather than smooth skin) helped adhesion and resulted in no further loss of tags due to falling off.

Assumption 4. Trained staff remain engaged and motivated to pursue the wildlife monitoring efforts throughout the project.

Today trained staff have remained engaged and motivated to pursue the wildlife monitoring efforts implemented. The team supports other partners and efforts that implement the tools they have been trained in. An example of this is the monitoring of lava lizards, where GNP staff trained during 2021 were able to support and co-lead the monitoring efforts conducted in year 1 of this project with a consultant. During Y2 GNP staff have supported all project activities including post-release monitoring of the finches and other non target species, including being lead drone pilot for marine iguana and vegetation surveys

Assumption 5. Existing programs to monitor Medium-tree finch on Floreana will continue for the foreseeable future.

This work is led by Universität Wien as part of a long-term study. Whilst work was not undertaken in 2023 due to the teams' other commitments for the programme i.e., short-eared owl tracking, UW conducted monitoring of Medium-tree finch nesting and treatment for the vampire fly *Philornis downsi* from January to March 2024. Data is being analysed at present and will be available in the following months to inform the short-term impacts of the removal of invasive rodents and feral cats on the species.

Assumptions Output 2:

Assumption 1. No extreme weather events (e.g., El Niño event) will occur that will affect the removal of invasive predators on Floreana and the recovery of at-risk species.

See Outcome, Assumption 1.

Assumption 2. Removal of invasive predators is completed successfully.

For assumption 2, local conditions and risk associated with a possible El Niño event were closely evaluated and determined to be mitigatable. Adjustments to the baiting strategy and application volume were key contributors to increase confidence in success. Shortly after implementation began, early detection efforts indicated a rapid decline in rodent and cat populations immediately after bait was initiated despite habitat conditions not aligned with a typical dry season. This declining trend of individuals detected continued to zero for rodents within roughly one month while the few remaining cat detections continue to drop as targeted methods removal the final individuals. Increases in vegetation growth have required more regular clearing of access trails, camera, and traps sites, which has been mitigated for by adjusting the frequency of site maintenance. Anecdotal observations witnessed foraging evidence by rodents on alternative food sources decline from a regular occurrence to non-existent. This has been further highlighted as agricultural products once heavily impacted by predation now remain untouched. Furthermore, early inspections across areas considered abundant in high-quality natural food found evidence of rodent's preference of bait, which was clearly identifiable by faeces, found amongst alternative foods, matching the blue hue of the bait pellets. As indicated previously, although potential extreme weather events were forecast to occur, the severity at the project site was mild and the mechanisms and mitigations put in place remain on track to deliver a successful eradication. Under normal circumstances it takes usually 2-years post bait operation to declare an eradication successful.

Assumption 3. Existing programs to monitor Medium-tree finch nesting on Floreana will continue for the foreseeable future.

See Output 1, Assumption 5.

Assumption 4. Trained staff can find and identify active medium tree finch nests to inject with insecticide against Philornis.

This will be undertaken by UW staff in Year 2 for the project. Several people trained in this technique still work within the Floreana Programme partners. In Y2 51 medium tree finch nests identified and 19 sprayed.

Assumption 5. Trained persons remain engaged and motivated to pursue the treatment of active nests with insecticide.

Yes. Nest treatment trials were undertaken throughout January to March led by the UW team

Assumptions Output 3

Assumption 1: Community members willing to engage in sustainable livestock feeding management practices training and implementation at each farm.

This has held true with 100% of farms (24 households) continuing engagement throughout Y2 of the project.

Assumption 2: No extreme or unusual weather conditions affect the production of agricultural products to be utilized for the development of balanced feed for livestock during the implementation.

No unusual or extreme weather conditions have occurred that will impact. However, heavy rains due to El Nino in 2023 caused three farmers to lose 20% of corn harvest.

Assumption 3: Support from the Ecuadorian Ministry of Agriculture (MAG) will be maintained to provide technical assistance to the farmers while implementing the new livestock management and feeding practices.

Jocotoco have recruited an Agricultural Technician to lead all the training and provide technical assistance to farmers, who has been in place since April 2022. The MAG have continued to support the work providing technical assistance regarding monitoring of livestock disease risk and veterinary health care.

Assumptions Output 4

Assumption 1: Enabling conditions to establish the infrastructure required are in place (e.g. access to Floreana island and construction materials arrived from the mainland without any issues).

All conditions for enabling the building of necessary livestock structures were met and all infrastructure has been completed, except for that of two new households (with funding from other sources).

Assumption 2: Community members willing to engage in sustainable livestock feeding and harvest management practices training and implementation at each farm.

Community members have continued to engage with training and follow up monitoring throughout Year 2.

Assumption 3: Removal of invasive predators is completed successfully

Early efforts to detect possible remnant rats or mice have been encouraging and continue to build confidence towards confirming rodent eradication. Detection devices are in the form of wax chew blocks, remote cameras, detection dogs, thermal drone work, bait station monitoring, and community vigilance with a reporting network. Confidence will continue to build as time elapses. This is due to an increase in the statistical likelihood of making a detection as a remnant rodent population would quickly reach a population density unlikely to evade the suite of detection tools. Furthermore, the removal of the last remaining cats is on track as the island-wide camera detection network guides spot baiting and targeted trapping efforts. Considering Island Conservation's impressive track record of successful rodent and feral cat eradications implemented worldwide, success with effective partnering, and application of technical expertise, we are confident that removing invasive predators will be achieved.

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

Project impact

Ecological restoration of Floreana Island safeguards endemic and globally threatened species, enhancing livelihood resilience and food security while providing a community-values integrated model for inhabited islands restoration.

In regard to the overall impact towards supporting biodiversity outcomes, significant progress made to date this year with five species of Darwin's finch successfully held in captivity during the baiting operation and released following this. Additionally, 64 short-eared owls are currently being held in captivity on Santa Cruz which will be released when conditions allow.

Whilst not funded under this grant the baiting operation was successfully carried out during October to December 2023 and post-eradication monitoring to ascertain success is underway. Early indications are positive and the removal of rodents and feral cats from Floreana will enable the reintroduction of several globally threatened species. The aviaries built for this mitigation will remain on Floreana and be used during the reintroductions of missing bird species over the coming years, such as the Floreana mockingbird.

The infrastructure and training provided to farmers for developing their own silage and animal feed provide multiple benefits to the Floreana community, improving livestock health, product quality, and production resilience to climate change. Whilst early days farmers are already highlighting the positive impact on crops

following the baiting operation in 2023. As part of the overall Floreana restoration project, in alignment with the Darwin Initiative priority to impact human wellbeing, modifications will be made to the main dock on the island that improves access to supplies and equipment. This has also increased awareness of biosecurity, a vital component of the overall project that will support the investment made and benefit the community in the long-term by reducing the impact of invasive species on their livelihoods.

4. Project support to the Conventions, Treaties or Agreements

Ecuador is party to several multilateral environmental agreements regarding the protection of the environment (17 treaties have been endorsed and ratified) under the Convention of Biological Diversity (CBD). Ecuador is also Party to the Nagoya and Cartagena Protocols. Therefore, Ecuador has developed their own NBSAP as mandated by the 10th CBD Conference of Parties (COP) in Nagoya, Japan where the Aichi Biodiversity targets were decided.

As per the Aichi Target, this Darwin Initiative project supports Ecuador's efforts by promoting and facilitating sustainable management of areas under agriculture, ensuring conservation of biodiversity (Target 7), while improving food security. It also creates the enabling conditions for implementing the eradication of invasive alien species (Target 9) from Floreana Island. Additionally, by eradicating invasive species and managing associated risks to wildlife populations this will prevent the extinction and protect populations of threatened species (Target 12), such as the Critically Endangered medium tree-finch, as well as enable the reintroduction of the Endangered Floreana mockingbird and 11 other species.

As per the 15th COP of the CBD in Kunming-Montreal, where parties approved the Post 2020 Global Biodiversity Framework (GBF), encompassing four goals and 23 targets to be achieved by 2030, this project also supports Ecuador in addressing and accomplishing 2 Goals and at least 4 targets (4, 6, 8,10).

This project incorporates a holistic approach, so by eradicating invasive alien species (IAS) and managing the associated risks for humans and non-target species, Ecuador will support the GBF ambitious goals and targets. More specifically, Goal A aims to maintain, enhance, or restore the integrity, connectivity, and resilience of all ecosystems, sustainably increasing the area of natural ecosystems by 2050. This goal also aims to halt human induced extinctions of known threatened species, reduce tenfold the extinction rate and risk of all species, and increase the abundance of native wild species to healthy, resilient levels. Goal B aims to sustainably use and manage biodiversity, securing nature's interconnectedness and overall contribution to people.

The project is undoubtedly supporting the new GBF by:

- Target 10: Promoting and facilitating adequate sustainable management of land and sea resources by implementing friendly biodiversity practices ensuring conservation of biodiversity and reducing human/biodiversity conflicts.
- Target 6: Also, by creating the adequate conditions for the removal of IAS, and implementing the eradication, the Project is supporting Ecuador's ambition to achieve that aims to eliminate IAS from biodiversity in a priority site, specifically on an island.
- Target 4: With the eradication implemented, the populations of at least 54 species listed on an endangered category by the IUCN, will be able to thrive without one of the major drivers of extinctions -IAS- ensuring that Ecuador is accomplishing at the same time with which the objective is to halt human induced extinction of known threatened species and for the recovery and conservation of species, in particular threatened species.

Specific Conventions, Treaties, and Agreements Mentioned

GOAL A

The integrity, connectivity and resilience of all ecosystems are maintained, enhanced, or restored, substantially increasing the area of natural ecosystems by 2050;

Human induced extinction of known threatened species is halted, and by 2050, extinction rate and risk of all species are reduced tenfold, and the abundance of native wild species is increased to healthy and resilient levels;

The genetic diversity within populations of wild and domesticated species, is maintained, safeguarding their adaptive potential.

GOAL B

Biodiversity is sustainably used and managed and nature's contributions to people, including ecosystem functions and services, are valued, maintained, and enhanced, with those currently in decline being restored, supporting the achievement of sustainable development, for the benefit of present and future generations by 2050.

TARGET 10

Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, in particular through the sustainable use of biodiversity, including through a substantial increase of the application of biodiversity friendly practices, such as sustainable intensification, agroecological and other innovative approaches contributing to the resilience and long-term efficiency and productivity of these production systems and to food security, conserving and restoring biodiversity and maintaining nature's contributions to people, including ecosystem functions and services.

TARGET 6

Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by identifying and managing pathways of the introduction of alien species, preventing the introduction and establishment of priority invasive alien species, reducing the rates of introduction and establishment of other known or potential invasive alien species by at least 50 percent, by 2030, eradicating or controlling invasive alien species especially in priority sites, such as islands .

TARGET 4

Ensure urgent management actions, to halt human induced extinction of known threatened species and for the recovery and conservation of species, in particular threatened species, to significantly reduce extinction risk, as well as to maintain and restore the genetic diversity within and between populations of native, wild and domesticated species to maintain their adaptive potential, including through in situ and ex situ conservation and sustainable management practices, and effectively manage human-wildlife interactions to minimize human-wildlife conflict for coexistence.

TARGET 8

Minimize the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions, including through nature-based solution and/or ecosystem-based approaches, while minimizing negative and fostering positive impacts of climate action on biodiversity.

5. Project support for multidimensional poverty reduction

Floreana farmers rely heavily on imported livestock feeds from mainland Ecuador. This increases production costs and limits access of these vulnerable households to protein because the number of animals that can be maintained by a household for protein is reduced. Additionally, the annual dry season and ENSO event negatively impact animal production in Galápagos because local feed (e.g., pastures and other produce) availability is reduced, as well as their agricultural production. By implementing and training the community on sustainable livestock management practices (e.g., silage, local nutritionally balanced feed production), and improved harvest management practices, as well as establishing irrigation systems at each farm, food security and household incomes can be improved. Infrastructure and training (39 persons) in these areas began in Y1 and continued through Y2.

Some expected results by the end of the project include:

Without rodents, crop production will increase 30-40%. An increased supply of locally produced, nutritionally balanced livestock feeds, will reduce the need of importing from the mainland, thereby reducing livestock production costs by c.20%.

Improved harvest management will reduce losses from harvest to consumer by 15-20% representing annual savings of 6,000-8,000 USD per farmer. These will all combine to increase farmers' household incomes including a significant benefit to women who comprise 70% of all 40 farmers on Floreana.

Sustainable livestock management will facilitate ecological restoration, enhancing ecotourism opportunities (through increased wildlife viewing opportunities) and provide improved conditions for growing and harvesting crops on Floreana.

This will improve food security, increasing the abundance and variety of foods readily available for the local community (c.40 households), improving their resilience to global climate change and local climate fluctuations.

Increased household incomes resulting from these improved livestock and crop management measures are sustained, allowing vulnerable families to break out of poverty.

Strategies and lessons learned from Floreana will be transferred to other inhabited Galápagos islands (3 other islands), improving food security and household incomes across the archipelago (for approx. 1000 households).

Initial indications immediately post eradication are that farmers are already benefiting from the removal of rodents with 100% of all farmers surveyed saying they are experiencing 75%-100% less crop damage than in previous years. Anecdotal evidence such as the first avocados reaching ripeness undamaged and corn germinating in the wild for the first time in living memory suggests this project will have a positive impact on poverty.

6. Gender Equality and Social Inclusion (GESI)

Please quantify the proportion of women on the Project Board ¹ .	Within the Darwin Initiative Project Board consisting of Durrell, IC, Jocotoco and GNPD 1 of 4 persons are women (25%). In terms of representation of women leading mitigation efforts 5 out of 9 are women (56%) and within the Floreana Community Council 4 of 7 are women (57%).
Please quantify the proportion of project partners that are led by women, or which have a senior leadership team consisting of at least 50% women ² .	Of the six named project partners four of six (67%) are led by women: Durrell, IC, GCT and UW

GESI Scale	Description	Put X where you think your project is on the scale
Not yet sensitive	The GESI context may have been considered but the project isn't quite meeting the requirements of a 'sensitive' approach	
Sensitive	The GESI context has been considered and project activities take this into account in their design and implementation. The project addresses basic needs and vulnerabilities of women and marginalised groups and the project will not contribute to or create further inequalities.	
Empowering	The project has all the characteristics of a 'sensitive' approach whilst also increasing equal access to assets, resources and capabilities for women and marginalised groups	X
Transformative	The project has all the characteristics of an 'empowering' approach whilst also addressing unequal power relationships and seeking institutional and societal change	

Durrell and its partners involved in this project remain steadfastly committed to the principle of equal opportunities and gender equality across all levels of the project and their respective organisations. This project has aimed to promote the inclusion of women in the farming industry, what has traditionally been a male dominated society.

Numerous female community leaders on Floreana have been closely involved in the community consultation process for this project and through the implementation of the invasive rodents and feral cat eradication.

During Y2 Jocotoco's Agricultural Technician has been working to motivate more women (six applications) from the Floreana community to join the Floreana Green Farmer's association (see Appendix 3.4). As stated in the application, by the end of Y3 of this project, we are planning to create opportunities for female farmers on Floreana to attend women-in-agriculture meet-ups on other Galapagos islands. This will facilitate knowledge exchange opportunities to share experiences and lessons learned in utilizing the new livestock feed systems and harvest management techniques being implemented on Floreana. This will

¹ A Project Board has overall authority for the project, is accountable for its success or failure, and supports the senior project manager to successfully deliver the project.

² Partners that have formal governance role in the project, and a formal relationship with the project that may involve staff costs and/or budget management responsibilities.

contribute to a collective commercialization increase and added product value for women-owned farm products.

7. Monitoring and evaluation

The M&E logframe developed for the proposal remains suitable. Each organisation (Durrell, IC, Jocotoco) has responsibility for M&E related to their portions of the project on a monthly basis with respect their individual institutional coordinators. The Project Leader undertook monthly correspondence (calls, email and WhatsApp) with project partners. Given the importance of Y2 towards the mitigation component the Project Leader was in weekly contact with Durrell's Mitigation Lead (mainly via WhatsApp and scheduled calls).

A Floreana Project Steering Committee comprising Jocotoco, IC and Durrell met on average every two weeks between May and September in the lead up to the eradication and whilst assessing the potential impacts of El Niño. This was also conveyed to the BCF team in advance as it had potential implications on this on the project.

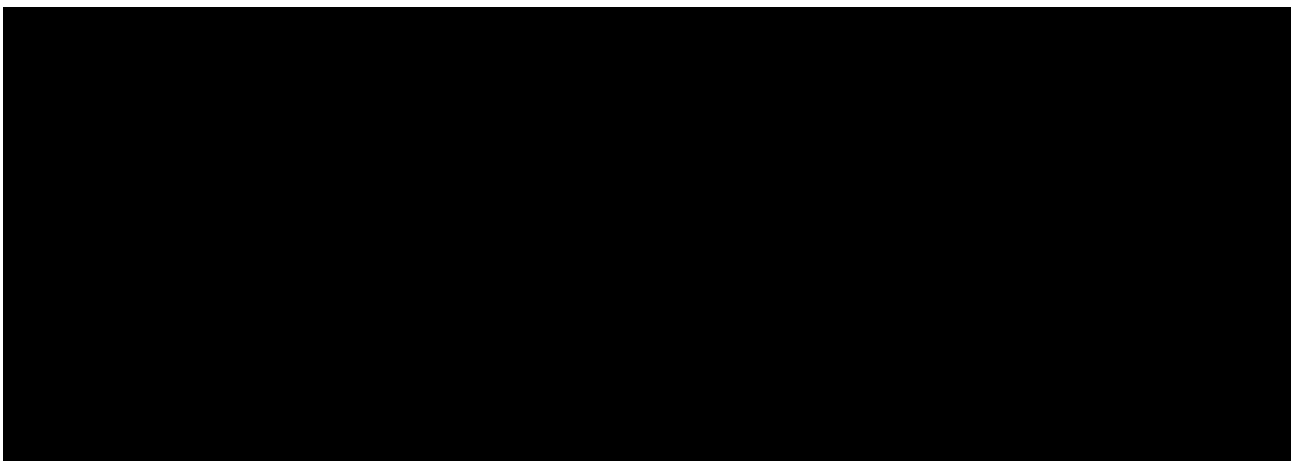
The Project Leader made two visits to the project in April 2023 and February 2024 to meet partners in person plan and assess progress across the logframe.

8. Lessons learnt

Extreme weather events (El Niño event) and adaption to plans and guidelines to achieve project goals

This challenge provided some important lessons regarding the importance of adaptive management required for implementing the removal of invasive species on islands and mitigating the associated risks to non-target wildlife, livestock, and, therefore, human populations. While removing invasive rodents and feral cats was planned for implementation during a year with no extreme weather events, it was critical to meet funding and community commitments to ensure that the project was implemented within the projected timeline and, most importantly, with a great chance of success. As mentioned earlier (Section 3.4), at the beginning of 2023, the NOAA climate prediction centre modelling showed an increased possibility of an El Niño event for 2023/4, which began to materialize locally in a short a-seasonal window of precipitation in May with extended forecasts suggesting an increase in severity but with considerable uncertainty. As a result of these conditions, we did experience a wetter-than-average year, yet mild compared to regional predictions and previous experiences. The Floreana Project Steering Committee closely evaluated project risks associated with El Niño conditions and identified and implemented mitigation actions to improve the likelihood of eradication success

In addition, the project team also had to adaptively manage the guidelines developed for captive holding of Darwin finches to ensure their adaptation to captivity and survival during the risk period (e.g., bait dispersal for removing invasive rodents and feral cats). As previously indicated (Section 3.4), finches' breeding season extended beyond the usual timing due to El Niño conditions impacting the birds' resilience during captive holding, resulting in increased mortality events while in captivity. This required our team to stop, and delay captures to monitor breeding behaviour on wild populations and adapt the capture and captive strategy to ensure their adaptation and survival (e.g., targeting non-breeding birds for the captive population and developing new techniques for providing successful quarantine and treatment to sick birds while in captivity). These lessons are being incorporated in the guidelines developed for Darwin finches in preparation for the implementation of this project. They are being shared with project and resource managers and scientists working with finches for consideration in future restoration efforts that may require the captive-holding of Darwin finches for non-target mitigation purposes during invasive species eradication or for reintroduction/translocation efforts on Floreana and elsewhere within the Galapagos Islands archipelago.



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

Responses to Y1 Annual Review comments

1. Please provide a status update of socioeconomic and farmers' livestock production reports

During 2022, INEC (Ecuadorian Statistics and Census Institute) conducted a population and housing census, so we have updated information on the number of inhabitants, demographics, housing type, etc. In the case of Floreana, they reported 145 inhabitants of which 52% are men and 48% are women, the household size is 2.96 members, among other information that can be found in the official web site: <https://censoecuador.ecudatanalytics.com/>

Furthermore, the results from the agricultural census for Galapagos (Renagro) were also published in 2022. The results for Floreana are ready in the web page choosing the option Galapagos for province, San Cristóbal for canton and Santa María for parroquia. This is a progress in updating the baseline of agricultural activities of Floreana related with livestock, transitory and permanent crops, among others. (<https://servicios.mag.gob.ec/renagro/TableroRenagro/>).

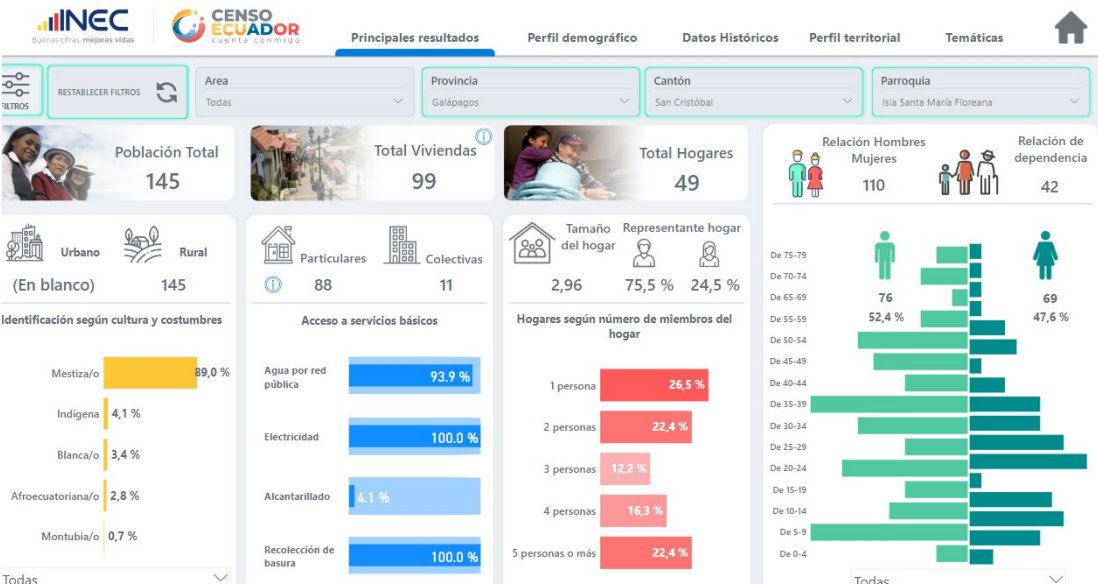


Figure X: data from the INEC census of Floreana.

2. Activity 4.4 (Undertake baseline surveys) was not carried out due to prior commitments of Jocotoco. However, the project addressed this by planning to utilise baselines from a comprehensive assessment conducted in 2017. It is unclear what happened with the allocated budget. Kindly provide clarification.

The budget allocated for the baseline study was part of the budget allocated for field trips and travel expenses of the Jocotoco technical team on Floreana. Whilst the baseline was unable to be conducted this budget was utilised to carry out all the other activities undertaken by Jocotoco reported in Y1.

3. Please provide more information on the safeguarding arrangements

The project is part of the wider Floreana Island Restoration Programme which has funding from multiple sources including World Bank, GEF, KfW. As part of the funding requirements for these grants ESMS assessments have been completed.

Since the design of the project, a highly participatory process has been maintained. However, throughout the project, Island Conservation and since 2022 Jocotoco have maintained staff (technicians, social scientists and island restoration specialists) in charge of community relations who have worked in a person-to-person approach to resolve doubts, reduce conflicts, and establish cooperation agreements and shared responsibilities in the project. In 2023, a staff member from Island Conservation with ample experience with community work supported the project by working with Jocotoco team to ensure all households had their doubts resolved and risk to children was managed appropriately following the guidelines of the children and people with impaired capabilities risk management plan.

For operations on Floreana a Communications and Crisis Management procedure was created for dealing with any community safeguarding issues arising. This comprised both an internal (Appendix 3.5) and an external (Appendix 3.6) document the latter of which had a number and email address to which any person could get in touch with queries or concerns.

10. Risk Management

El Niño weather event

The biggest challenge the project has faced is the impacts of El Niño. In the Galapagos, an El Niño event is characterised by warmer, wetter weather on islands. Native fauna, in particular birds, have adapted to this natural event to maximise breeding resulting in a prolonged breeding season. On Floreana, breeding in finches and other land birds normally ends April to early May and the capture of finches was planned to start once this had finished in late May. The issue with capturing birds in breeding condition is that there is a greatly increased risk of mortality due to their increased hormone levels reducing resilience to stress events (all wild birds have high levels of coccidiosis which can cause gut haemorrhaging under stress). Three trial captures were undertaken in late May but almost all birds caught were in breeding condition with high rates of mortality (over 20%). As a result, captures were paused for 4 weeks to increase chance of birds coming out of breeding condition. When resumed it was clear many birds were still in breeding condition. This meant we would be unlikely to capture the planned number of birds (due to time and actual numbers of suitable birds caught in nets) and had to refine the protocols to minimise stress further and minimise mortality. Following consultation with partners it was agreed to target a minimum number of 50 individuals per species (this is the minimum number to achieve based in a Population Viability Analysis conducted for each species during the project planning phase) and a focus was given to the ground and cactus finch as these are more at risk of eating the poisonous bait. It was also agreed with Galapagos National Park that overall mortality (capture and deaths in captivity) should be no more than 20% (original target 10%). Following this, all captures meeting the new targets were completed mid-September (3 weeks before the first bait application) and overall mortality rate for finches was 14.8% (including trial captures). It should be noted that birds were still being caught in mid-September in breeding condition and with forming eggs. One week after captures had finished Galapagos has had an outbreak of Avian flu (detected in two seabird colonies). Both aviaries were double-meshed, and passerines were considered low risk but to minimise risk further we put in additional biosecurity measures at the aviaries (additional clothing, disinfectant, banning all GNP staff who keep chickens).

Up until mid-August the confirmation of El Niño was casting doubt on whether the eradication would go ahead in 2023 or be postponed due to the increased probability of failure due to the warmer, wetter conditions. As indicated previously in Section 3.4 and 8, the Floreana Project Steering Committee closely evaluated project risks associated with El Niño conditions and identified and implemented mitigation actions to improve the likelihood of project success (i.e., removal of invasive rodents and feral cats).

Difficulties with rodent facility establishment and personnel

The rodent facility established to produce enough rodents and guinea pigs to feed the captive short-eared owl population regularly was very slow and has not yielded the results expected. The person selected for establishing the vivarium and conducting daily rodent and guinea pig husbandry did not meet the needs of the role and responsibilities, which impacted the success of the initiative. To improve the success IC recruited volunteers who have experience working with lab rodents, with the plan to provide a small stipend to cover food and lodging for volunteers. To date we have had two rodent breeder volunteers and have secured the support of at least three more. Given that the veterinarian hired to monitor and care for the Short-eared owls has extensive experience in managing nutrition in a lab setting such as this, she is overseeing the cohort of volunteers. Additionally, we determined that the focus of our rodent and guinea pig breeding program to feed owls will be shifted to breeding rodents (rats and mice) only starting in November 2023, as guinea pigs length of breeding is longer (2 months vs 21 days for rodents) and therefore to produce enough individuals for owl feeding would be lengthy and very time consuming, reducing the possibilities of our effort to be successful. The delay on the establishment of this rodent colony resulted in the need of feeding owls with one-day-old chicks (poultry) solely, which increased the cost of captivity quite dramatically from what it was anticipated when we submitted our proposal. To reduce the cost associated with this, the IC team approached chick incubators on mainland Ecuador to secure the donation of day-old chicks for the time owls will be in captivity (approx. 2 years). This donation was secured and since January 2024 we started receiving these donated day-old chicks.

Avian influenza (H5N1) arrival in the Galapagos

On 18 September, avian influenza was reported to have arrived in the Galapagos. To date, only seabirds (boobies and frigatebirds) on two areas (Genovesa Island and Punta Pitt, San Cristobal Island) have been found positive for the disease. This prompted the Galapagos National Park and Biosecurity Agency to implement immediate biosecurity protocols and epidemiological surveillance to prevent the dispersal of the disease across the archipelago. Additionally, this prompted immediate actions from the project team and partners to reduce any risk to the captive holding populations (e.g., Darwin finches and Short-eared owls) and to the implementation of the eradication rodents and feral cats on Floreana.

For the captive holding populations (e.g., Darwin finches and Short-eared owls), we implemented stricter biosecurity protocols at each of the aviaries (on Floreana and Santa Cruz Islands) to prevent any exposure. This required additional retrofitting of the short-eared owl permanent aviary on Santa Cruz Island to prevent any contact of wild birds with the captive owls. Funding for this was secured from Galapagos Conservation Trust and Fundación Jocotoco and was completed in October.

Additionally, all project partners through the Floreana Project Steering Committee monitored the situation closely as it developed. Establishing an appropriate communication strategy to manage any potential crisis resulting from the status of Avian Influenza in the archipelago and possible consequences to the overall project implementation and current activities post-eradication. The partnership continues to ready to respond if any potential issues arise from that situation, including if, for example, our captive holding facilities get blamed for any outbreaks at poultry farms, or we have any cases of influenza within our remaining captive population of short-eared owls.

Requiring additional staff time from the Short-eared owl veterinarian

As mentioned above, the unexpected arrival of avian influenza required our team to adjust plans accordingly to reduce the risk of transmission amongst birds in captivity. One important adjustment that we have had to make that impacted the grant budget for year 2 (and necessitated a formal “change request” noted earlier in this report), was the need to increase the amount of time allocated for the Short-eared owl veterinarian. Originally, we had planned to hire the Short-eared owl veterinarian at 60% of her time for Year 2 and 40% for Year 3, since we had expected to also be receiving veterinary support from a veterinarian at the Galapagos National Park. However, the veterinarian from the GNPD is no longer able to fulfil these duties since she cannot come in contact with captive birds as she continues to monitor Avian Influenza (AI) in the Galapagos, and we cannot risk exposing the captive birds. This unexpected challenge due to AI in the Galapagos, as well as the need to adjust the staffing plan for the vivarium (noted under the “Difficulties with Rodent Facility Establishment and Personnel” section above), indicates that we needed the veterinarian hired for this project to lead the captive holding of short-eared owls to be staffed at 100% of her time for Year 2 (and likewise for Year 3). This is crucial to ensure the owl captive holding team continues to follow appropriate biosecurity protocols and we can prevent and or manage appropriately an exposure to AI or other infectious diseases within our captive short-eared owl population.

Presidential re-election and subsequent change of administration officials

In May 2023, an unprecedented constitutional mechanism was invoked, which triggered both congressional and presidential elections. As a result, a presidential election was held midway through the term, which, once initiated, carried uncertainties around the timing of decision-making, how the process would be carried out, and when a new administration would take control. Fortunately, the foundational work to clarify the benefits of the work on Floreana resulted in broad support for the project regardless of political preferences. Understanding that government instability posed a risk, permitting, community support, and funding were secured for each critical component prior to implementation, and a detailed pathway forward to achieve success was shared in an effort to provide confidence in stakeholders, support rapid onboarding as required, and intended to insulate efforts from political instability. This strategy has been incorporated as a safeguard to administration changes over the lifespan of the project.

The change in Ecuador's government in November 2023 also led to a change in the main authority of the Galapagos National Park, one of our main partners. So far, the project has been executed as planned under the previous two authorities in this position. The new authorities have been transparent and have demonstrated a strong commitment to ensuring the project continues to be executed normally.

11. Sustainability and legacy

Although we have identified some new risks to the project, we have mechanisms to manage those in place. As such, we don't foresee any changes in the proposed sustainability and legacy of the project. Under Section 10, you can find information about the mechanisms in place to cope with the risks identified in Y2 of the project, including the incorporation of a detailed pathway for safeguarding the project from political instability and therefore changes in administration of key partners like the Galapagos National Park. At a local community level there has been great engagement in measures aimed at promoting sustainable agriculture on Floreana with local farmers feeling optimistic about implementing sustainable livestock and crop management practices now that the risk of rodent loss has significantly decreased. The Ministry of Agriculture and Livestock, jointly with Jocotoco, will continue to provide technical assistance to the people of Floreana. In addition, plans are underway to strengthen infrastructure and marketing channels for agricultural products during 2024 and 2025 to ensure that their economic returns improve and, thus, their quality of life.

At the project level there has been great engagement of local Galapagos National Park staff on training for monitoring impacts to non-target species and wildlife in general that is supporting the implementation of other activities within this project, as well as other projects within the Galapagos Islands.

Over the next year of the project as the programme moves to post-eradication there will be more activities to ensure the long-term sustainability of actions, as we are already seeing great interest from other local NGOs and scientific organizations such as Charles Darwin Foundation and Galápagos Conservancy (i.e. Conservando Galápagos) in joining forces with project partners to support the restoration of 12 locally extinct species on Floreana Island, starting with the Floreana giant tortoise and some of the land bird species, while also supporting the long term goal of the Floreana community of a Sustainable Floreana where the local community thrives together with nature.

12. Darwin Initiative identity

A communications plan was developed by the Floreana Programme steering group (Annex 8) which guided all project communications during the rodent and feral cat eradication implementation, as well as covering those activities to be undertaken under Year 3 of this project. Given the sensitive nature of the work being undertaken i.e., an island-wide eradication of invasive mammals, communication and publication of information has been carefully controlled. In addition, all communications are signed off by GNPD as the programme lead and national authority. Durrell and partners will continue to work with the Programme Steering Committee to ensure communications reflect the various donors to the work, including Darwin Initiative in any communications.

A project website has been developed in 2024 called Floreana Vuelve a Florecer "Floreana Flourishes Again" to keep the audience informed and updated on the project's progress. (https://floreanavuelvafloreceer.ec/index_en.php).

To date the Darwin Initiative logo has been included on official documents e.g., the official handover document for infrastructure signed by farmers and the Ecuadorian Minister of Environment.

Link to press release showcasing the support from Darwin Initiative can be found on these links:

- <https://www.islandconservation.org/groundbreaking-ecological-restoration-initiative-begins-on-floreana-island->

[galapagos/?fbclid=IwAR1hwuTPc1keMmDheYbWta8QL9kJOCS2rRdbbaLsgfQ4v5XC07n8M1678tl](https://www.islandconservation.org/press-release-finches-released-in-the-galapagos-signal-triumph-for-floreana-island-restoration-project/)

- <https://www.islandconservation.org/press-release-finches-released-in-the-galapagos-signal-triumph-for-floreana-island-restoration-project/>

13. Safeguarding

Has your Safeguarding Policy been updated in the past 12 months?	Yes
Have any concerns been reported in the past 12 months	Yes
Does your project have a Safeguarding focal point?	Yes Carlos Gaona from GNP was designated as Safety Officer for the overall project. Each partner has Safeguarding personnel and focal points Jocotoco established a specific phone number and email for people from community to contact 24/7 during the project
Has the focal point attended any formal training in the last 12 months?	No
What proportion (and number) of project staff have received formal training on Safeguarding?	Past: 13 (IC and Jocotoco staff and volunteers) Planned: 18 (IC staff and volunteers)
Has there been any lessons learnt or challenges on Safeguarding in the past 12 months? Please ensure no sensitive data is included within responses.	
<p>One key lesson learned is that when implementing larger projects such as the Floreana Island Ecological Restoration, a project with several partners responsible for different components, a process is in place to ensure that safeguarding (safety policies) continue to be enforced if new innovative tools are implemented or new personnel is brought in to prevent incidents that could jeopardize the safety, health, and security of project personnel and the communities we are working with.</p>	
<p>Does the project have any developments or activities planned around Safeguarding in the coming 12 months? If so please specify.</p> <p>In the build up to the eradication in October 2023, safeguarding measures to ensure safety of local communities were increased led by in-country partners and this will continue as the project advances to the new phase of post-eradication (i.e. restoration).</p> <p>Safeguarding issues surrounding staff are the responsibility of each partner organisation and all new staff will be briefed in and provided copies of the institutions relevant safeguarding policies and be informed of the mechanisms by which they can raise concerns. Additionally, they will be requested to sign a document acknowledging reception and understanding of the policies before initiating their duties.</p>	
<p>Please describe any community sensitisation that has taken place over the past 12 months; include topics covered and number of participants.</p> <p>All health or concerns from the Floreana community surrounding the project, especially the invasive rodent and feral cat eradication were addressed well in advance throughout all the last 10 years the Floreana Ecological Restoration Project was being planned, but also over the last 12 months and these were incorporated into Project planning and individuals property management plans. The latter covering 100% of households on Floreana Island.</p>	

Have there been any concerns around Health, Safety and Security of your project over the past year? If yes, please outline how this was resolved.

Based on comments above:

Heat management for personnel wearing PPE at the load site:

This was managed by adding more people that allowed for swapping people around for taking breaks/cool downs.

Safety incident with a drone resulting in injuries to one project staff member:

This was managed by increasing our safety requirements not only for staff, but extending to volunteers, contractors, and partners. This includes for drones owned by IC the following: developing a drone operation and safety plan that needs to be approved internally by IC prior to flying. This is being added to contract for partners and contractors in addition to providing a copy of health insurance.

Report of inappropriate behaviour from member of partner organization

This was reported to the managing institutions (Durrell) management and Global Safety and Risk Manager and subsequently reported to the project lead (Jocotoco) where it was investigated following the pre-established protocol. The "Crisis Communication Manual" was used to maintain a safe and healthy work environment for both parties throughout the investigation phase.

14. Project expenditure

Table 1: Project expenditure during the reporting period (1 April 2023 – 31 March 2024)

Project spend (indicative) since last Annual Report	2023/24 Grant (£)	2023/24 Total Darwin Costs (£)	Variance %	Comments (please explain significant variances)
Staff costs (see below)				
Consultancy costs				
Overhead Costs				
Travel and subsistence				
Operating Costs				
Capital items (see below)				
Others (see below)				Increased costs of volunteers (hotels) due to less frequent ferries between Santa Cruz and Floreana
TOTAL	204,682	204,682		

One change request was submitted and approved in November 2023. These changes were:

Project spend category	Original budget	Amended Budget
Consultancy costs		
Travel and subsistence		
Operating Costs		
Other costs		
Total	£122,241	£122,241

Staff costs

Durrell

Roland Digby, Mitigation Officer: [REDACTED]

Jeff Dawson, Project Leader: [REDACTED]

Sarah O'Garra, Durrell Finance Officer: [REDACTED]

Island Conservation

Paula Castaño: [REDACTED]

Chad Hanson: [REDACTED]

Jocotoco

Victor Carrion, In-country Project Co-ordinator: [REDACTED]

Other costs

Volunteer Costs: [REDACTED]. This covered in-country costs of volunteers including accommodation in Floreana, a stipend to cover basic food and drink on Floreana, hotel accommodation in Santa Cruz before and after flights, ferry to and from Floreana and taxi to and from airport (A further [REDACTED] of costs covered through a private donation

Bank charges: [REDACTED] Cover bank fees associated with taking money from ATMs in Santa Cruz as all payments on Floreana need to be made in cash. No banks or ATMs on island

Table 2: Project mobilised or matched funding during the reporting period (1 April 2023 – 31 March 2024)

	Secured to date	Expected by end of project	Sources
Matched funding leveraged by the partners to deliver the project (£).	[REDACTED]		
Total additional finance mobilised for new activities occurring outside of the project, building on evidence, best practices and the project (£)	[REDACTED]		

15. Other comments on progress not covered elsewhere

One aspect to note is the fringe benefits of implementing during a period where higher precipitation is anticipated, particularly post-implementation where a delayed forecast of El Niño conditions resulted in heavy rains locally at the project site. Several outcomes may result from this including:

- Rapid degradation of residual brodifacoum in the environment is possible due to increased microbial activity associated with increased humidity. This can result in reduced holding times for native and domestic animals placed in captivity as a safeguard from chemical exposure. An example of this includes that release of all captive finches which has occurred ahead of schedule.
- Improved and prolonged breeding conditions can elevate recruitment rates. Subsequently, it is possible to experience expedited recovery of native species populations suppressed by invasive species predation and those temporarily impacted by rodenticide use.
- It may be possible to confirm rodent eradication in as little as one year. A standard metric of two breeding cycles, necessary to allow sufficient population growth, must elapse offering greater statistical confidence in monitoring and detection results to support declaring the eradication a success.

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

I agree for the Biodiversity Challenge Funds to edit and use the following for various promotional purposes (please leave this line in to indicate your agreement to use any material you provide here).

On February 22, 2024, the release of five native finch species was successfully completed, covering both the high and lowlands of Floreana Island in Galapagos, marking significant progress in the largest and most ambitious conservation and restoration project ever undertaken in the archipelago.

The Floreana Island Restoration Project is led by the Galapagos National Park, the Galapagos Biosecurity Agency and co-executed by the Jocotoco Conservation Foundation with technical assistance from Island Conservation and scientific support from the Durrell Wildlife Conservation Trust, and the Charles Darwin Foundation, among other important national and international institutions. Working hand-in-hand and in collaboration with the Floreana community, these partners strive to realize the vision of an ecologically prosperous and sustainable Floreana through the removal of invasive species and the reintroduction of twelve locally extinct native animal species, including the Floreana Giant Tortoise, Vermilion Flycatcher, and the Floreana Mockingbird.

After more than a decade of planning, the removal of invasive species began in October 2023 and was completed in December 2023. Removing invasive species will make Floreana Island safe for native plants and animals to once again flourish. While the removal of invasive species was in progress, finches were held safely in both the lowlands and highlands under careful watch by park rangers and conservationists.

Precautions for the protection of birds

In October 2017, a workshop brought together national and international experts to discuss specific strategies and measures for the care of native and endemic wildlife species that could be at risk during the invasive species removal process.

In response to these risks, in-situ captive management was chosen as a key protection measure for five finch species. Two aviaries were built on Floreana to house hundreds of individual finches and ensure their well-being during captivity, while removing invasive species.

Back to nature

With promising signs that the removal of invasive species was successful, the Galapagos National Park Directorate, Durrell Wildlife Conservation Trust, Island Conservation, the Konrad Lorenz Research Center for Behavior and Cognition at the University of Vienna, and Jocotoco Foundation safely released all finches from captivity -- 170 finches into the highlands and 340 into the lowlands, with a few Medium Tree-finches, Small Ground-finches, Medium Ground-finches and Cactus Finches wearing radio transmitters. The finches were released in waves, with the final population released on February 22, 2024.

File Type (Image / Video / Graphic)	File Name or File Location	Caption including description, country and credit	Social media accounts and websites to be tagged (leave blank if none)	Consent of subjects received (delete as necessary)
				Yes / No

Annex 1: Report of progress and achievements against logframe for Financial Year 2023-2024

Project summary	Progress and Achievements April 2023 - March 2024	Actions required/planned for next period
<p>Impact</p> <p>Ecological restoration of Floreana Island safeguards endemic and globally threatened species, enhancing livelihood resilience and food security while providing a community-values integrated model for inhabited islands restoration</p>		
<p>Outcome</p> <p>At risk wildlife and livestock populations are effectively protected during the eradication of invasive predators from Floreana Island while vulnerable community livelihoods are strengthened through sustainable livestock management by 2025.</p>		
<p>Outcome indicator 0.1</p> <p>By end Y2 at least 90% survival in six captive held bird species which would enable full recovery of wild populations.</p>	<p>By end of Y2, short-eared owl captive population had a survival of 98.5%. Birds to date remained in captivity and it is forecasted that by end of Y3 survivorship will remain the same. Evidence provided in Section 3.2 and Appendix 2.2</p> <p>Finches successfully held and released with a 82.2% survival rate (from first capture to release). Section 3.2 and Appendix 1.1</p>	<p>Captive holding of short-eared owls will be continued on Santa Cruz Island, until we have enough data that indicates that Floreana Island is ready to receive the captive population.</p> <p>Surveys and monitoring using radio transmitters will be initiated for short-eared owls on Floreana to monitor their survival and with that informed the release of the captive population.</p> <p>Post-release monitoring of finches</p>
<p>Outcome indicator 0.2.</p> <p>Measurable net increase in abundance of endemic reptiles (lava lizards and geckos) on Floreana by project end date compared to pre-eradication baselines. (Note changes to other species populations will likely take longer than 1 year).</p>	<p>Post-eradication survey of reptiles (lava lizard and gecko species) on Floreana undertaken in March 2024. Data is being analysed to compared with baseline data from 2023. However, anecdotal data is showing already an increase in the number of juveniles for both species in comparison to previous years.</p> <p>Report will be provided at Y3HYR</p>	<p>A further reptile survey is planned for March 2025</p> <p>Monitoring from ridge to reef (connector species) to measure how terrestrial restoration efforts (removal of invasive species) impact surrounding marine ecosystems is planned for July 2024.</p>

<p>Outcome indicator 0.3.</p> <p>Livestock feed imports reduced by 50% and an increase of 20-25% net income for Floreana livelihoods by end of Project cf. pre-eradication baselines.</p>	To be assessed in Y3	Farmer assessments carried out
<p>Outcome indicator 0.4.</p> <p>40 people trained by the end of project to ensure local capacity exists to maintain Floreana long-term sustainable livestock and local produce harvest management practices.</p>	39 farmers trained in Y1. Technical assistance and follow up support provided through Y2	Ongoing technical support and assistance to farmers
<p>Output 1</p> <p>Six at-risk species successfully held in captivity ($\geq 90\%$ survival) during eradication of invasive predators from Floreana and impact of eradication on five key wildlife groups understood (pre vs post eradication surveys).</p>		
<p>Output indicator 1.1</p> <p>Two aviary complexes (one in the highlands and one in the lowlands of Floreana) are operative by end of Y1 to enable captive holding of target finch numbers:</p> <ul style="list-style-type: none"> ● 140 Medium tree finches ● 150 Small tree finches ● 140 Common cactus finches ● 200 Small ground finches ● 200 Medium ground finches 	<p>Two aviary complexes completed in early May 2023 and operative for receiving Darwin finches by mid-May 2023.</p> <p>Evidence provided in Section 3.1 and Appendix 1.1</p> <p>618 finches caught for aviaries (62 Cactus, 219 Small ground, 167 medium ground, 98 small tree, 72 medium tree)</p> <p>(Capture and captive holding care of Darwin finches was completed successfully in Y2, with finches released back to the wild in February 2024. Evidence provided in</p> <p>Evidence provided in Section 3.1 and Appendix 1.1</p>	<p>As it was completed in Y2 and the five species of Darwin finches have been released, no additional actions for this Output are planned for Y3.</p>
<p>Output indicator 1.2</p> <p>One aviary complex (on Santa Cruz) and one temporary holding aviary (on Floreana) are operative by end of Y1 to enable captive holding of target numbers (60 birds max) of Galapagos short-eared owls.</p>	<p>Temporary owl enclosure on Floreana and Permanent owl enclosure on Santa Cruz completed and operative by July 2023. Additional retrofitting was completed in November 2023 to prevent exposure of captive owl population to Avian Influenza.</p> <p>Evidence provided in Section 3.1 and Appendix 2.1</p>	Ongoing maintenance of owl aviaries.
<p>Output indicator 1.3</p> <p>Six at-risk bird species are effectively protected during the eradication with at least 90% survival of captive held populations.</p>	<p>Finch (5 species) survivorship: 82.2% (518 birds released). (NB this is mainly due to high mortality rate at initial capture phase in May)</p> <p>Evidence provided in Section 3.1 and Appendix 1.1</p> <p>Short-eared owl survivorship: 98.5%</p> <p>Evidence provided in Section 3.1 and Appendix 2.2</p>	<p>Continue with daily activities to keep the captive population of short-eared owls healthy until they are released back on Floreana. This includes the breeding and trapping of rodents for supplementing the owl diet.</p>

		<p>Monitoring of wild populations of short-eared owls on Floreana (consider as sentinels) to inform release</p> <p>Monitoring of pesticide (rodent and feral cat bait) residues in the environment to inform release of owls</p>
<p>Output indicator 1.4</p> <p>Post-release monitoring (radio tracking and observational counts) of captive held Darwin's finches demonstrates survival in the wild with at least 30% of released individuals observed 1 year post release (Y3 Q4).</p>	<p>2-month post-release monitoring shows no mortality in released finches</p>	<p>Further post-release monitoring will be undertaken in Y3 to assess ongoing survivorship</p>
<p>Output indicator 1.5</p> <p>At least 5 local GNP staff trained in wildlife monitoring techniques in Y1 and Y3.</p>	<p>8 GNP staff trained in monitoring techniques owls, use of radiotracking tools including VHF attached to drones, predator activity survey, acoustic monitoring of landbird and seabirds, point counts of landbirds, boat-based bird counts of seabirds, vegetation estimates by photo-monitoring and soil and leaf sampling, and e-DNA sampling of water during Y2.</p> <p>Evidenced provided in Section 3.1 and Annex 2.2, 2.3 and 2.4.</p>	<p>Continue with training of local GNP staff on wildlife monitoring techniques associated with Darwin finches post-release monitoring, monitoring of wild populations of owls to inform captive population release (radiotelemetry, point counts and banding, thermal drone survey), and boat-based bird count of seabirds.</p>
<p>Output indicator 1.6</p> <p>Changes in abundance/population of 5 non-target native species groups (Darwin's finch; paint-billed crane; water birds; reptiles; Galapagos petrel) pre (Y1) and post eradication (Y3) quantified.</p>	<p>Baseline surveys completed for Darwin finches, Galapagos petrels and reptiles in Y1. Baseline waterbirds and crane surveys completed pre-project in 2021.</p> <p>Baseline monitoring for coastal connector species (landbirds, seabirds, marine iguanas, vegetation, and arthropods) completed in July 2023 and in January 2024 for monitoring effects of El Niño event on these connector species.</p> <p>Evidence provided in Section 3.1 and Appendix 2.3a and 2.3b</p> <p>Post-eradication surveys of lava lizards and geckos undertaken in March 2024. Report to be provided at Y3HYR</p>	<p>Post-eradication surveys for all key five non-target species groups will be undertaken in Y3.</p> <p>Monitoring for connector species from ridge to reef to measure the impact of invasive rodents and feral cat removal on seabirds, marine iguanas, and the surrounding marine ecosystems on Floreana Island. Planned for July 2024.</p>
<p>Output indicator 1.7</p>	<p>To be completed in Y3.</p>	<p>Undertake monitoring of Galapagos petrels and reptiles (lava lizards and geckos) and</p>

Increased abundance, distribution or breeding success is documented for key indicator species including Galapagos petrel, reptiles (lava lizards, geckos) by end of Y3 cf. pre-eradication baseline.		data analysis to measure impacts on abundance, distribution, or breeding success after the removal of rodents and feral cats from Floreana.
Output 2. Conservation measures (invasive predator eradication and nest treatment) demonstrate a reduction in nest mortality for the Critically Endangered medium tree-finch by end of project.		
Output indicator 2.1. Zero (0%) nest (egg and chick) mortality due to invasive predators (rodents and feral cats) post-eradication (Y3) recorded for 100 surveyed nests (Yearly average 44.5% mortality due to predations).	Mortality in 2024 at egg stage due to predation 14%. Likely due to invasive smooth billed anis Section 3.1 and 3.2, Appendix 4.1	Undertake nest monitoring in Y3Q4
Output indicator 2.2. At least four local GNPD staff trained in injecting finch nests with insecticide (permethrin) in Y1 to support <i>Philornis downsi</i> control before and after invasive predator removal from Floreana.	3 Ecuadorians trained in nest spraying and information shared with GNPD staff as none available to participate Section 3.1 and 3.2, Appendix 4.1	In Y3 will look to train GNPD staff in this technique
Output indicator 2.3. At least 20 medium tree-finch nests are successfully treated with permethrin insecticide to control against <i>Philornis downsi</i> maximizing fledgling success in Y2 and Y3.	19 medium tree finch nests sprayed with permethrin. Section 3.1 and 3.2, Appendix 4.1	Redo in Y3Q4
Output indicator 2.4. Total brood loss from <i>P. downsi</i> would go from 32.4% to 0% but partial brood loss may drop from 13% to 5% for medium tree-finch nests treated for <i>Philornis downsi</i> in treatment years (Y2 and Y3).	Of nests treated with known outcome 80% fledged, 10% egg abandonment, 10% brood loss. Section 3.1 and 3.2, Appendix 4.1	Redo in Y3Q4
Output 3. Floreana community (46% women) have increased self-sustainability in livestock management, animal feed production and harvest management and have shared lessons with 3 other islands/communities in Galapagos.		
Output indicator 3.1. One 2-month community training session for 40 people on balanced feed preparation using local resources and use of equipment in Y1.	Completed Y1	
Output indicator 3.2. All community households dedicated to livestock farming on Floreana (22 households, 40 persons) are trained in livestock	39 people trained in animal feed production in Y1	Follow up support will be provided from Jocotoco and MAG

feeding management practices (e.g. balanced feed and silage production) by end of Y1.	16 individuals (12 men, 4 women) representing 16 households trained in pig and poultry management in October 2023 Evidenced in 3.1 and Appendix 3.2	
Output indicator 3.3. All farmers (40 persons, 70% women managers) in Floreana have implemented and tried the sustainable livestock feeding management practices learned on their farms by mid Y2.	30 of 30 (100%) farmers interviewed in Q2 survey said they were implementing practices. 17 of 22 (76%) interviewed in Q4 survey said implementing all practices with 5 (24%) implementing some. Evidenced in 3.1 and Appendix 3.3a and 3.3b	Follow up surveys will be done in Y3
Output indicator 3.4. Import of livestock feed from mainland Ecuador reduced by 50% due to producing nutritionally balanced livestock feed locally resulting in average savings of \$882USD per year/farmer (approx. \$17,640/year for all 22 farming households) by the end of Y3.	To be done Y3	Surveys to be undertaken in Y3
Output indicator 3.5. All farmers (40 persons, 70% women managers) trained in improved harvest management practices by end Y1 and provided ongoing technical assistance throughout the project.	Completed Y1	
Output indicator 3.6. By the end of Y3 at least five women farmers from Floreana travel once (for 1 week) to other three inhabited islands within the Galapagos archipelago to develop knowledge on other agricultural practices, adding value to products and exchange knowledge with other women farmers.	To be completed Y3	Exchange to be organised and carried out in Y3
Output 4. Floreana community livelihoods become more resilient and food security improved through adoption of sustainable livestock management and improved harvest management practices by ≥75% farmers and eradication of invasive rodents.		
Output indicator 4.1. Seven piggeries are built and operative by the end of Y1 for managing risks to pigs during the invasive predator removal on Floreana and enhancing sanitary measures for meat production.	Completed Y1	
Output indicator 4.2. Seventy-five percent of Floreana farmers (70% women) increase production of livestock products (e.g. meat, eggs, milk) by ≥30%	To be completed Y3	Surveys to be undertaken in Y3

above baseline (start of project) to supply the local and tourism demand by the end of Y3.		
Output indicator 4.3. Zero livestock losses due to baiting occur during the removal of invasive predators from Floreana in Y2.	No livestock losses reported due to baiting	
Output indicator 4.4. Crop damage by rodents will be reduced to zero by the end of Y3, having an estimated savings of \$800-1500 USD per year/farmer.	To be completed Y3	Surveys to be undertaken in Y3
Output indicator 4.5. Agricultural produce loss from harvest to consumer is reduced to 15-20% (currently c.50% lost) by the end of Y3 through adoption of improved harvest management practices, having an estimated savings of \$6000-8000 USD per year/farmer.	To be completed Y3	Surveys to be undertaken in Y3

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

Project summary	SMART Indicators	Means of verification	Important Assumptions
Impact: Ecological restoration of Floreana Island safeguards endemic and globally threatened species, enhancing livelihood resilience and food security while providing a community-values integrated model for inhabited islands restoration.			
Outcome: At risk wildlife and livestock populations are effectively protected during the eradication of invasive predators from Floreana Island while vulnerable community livelihoods are strengthened through sustainable livestock management by 2025.	0.1 By end Y2 at least 90% survival in six captive held bird species which would enable full recovery of wild populations. 0.2 Measurable net increase in abundance of endemic reptiles (lava lizards and geckos) on Floreana by project end date compared to pre-eradication baselines. (Note changes to other species populations will likely take longer than 1 year) 0.3 Livestock feed imports reduced by 50% and an increase of 20-25% net income for Floreana livelihoods by end of Project cf. pre-eradication baselines.	0.1 Captive holding report and biological monitoring data and report. 0.2 Biological monitoring data and reports. 0.3 Initial and end of project socioeconomic and farmers' livestock production reports.	No extreme weather events (e.g. El Niño event) occur that may affect the removal of invasive predators on Floreana. Enabling conditions to complete the project remain in place for the duration of the project (e.g. access to Floreana Island, interest, permission, and mandate from the local community remains in place).

	0.4 40 people trained by the end of project to ensure local capacity exists to maintain Floreana long-term sustainable livestock and local produce harvest management practices.	0.4 Evaluation of capacity development and implementation of sustainable livestock and local produce harvest management practices by the Floreana community report.	
<p>Output 1</p> <p>Six at-risk species successfully held in captivity (≥90% survival) during eradication of invasive predators from Floreana and impact of eradication on five key wildlife groups understood (pre vs post eradication surveys)</p>	<p>1.1 Two aviary complexes (one in the highlands and one in the lowlands of Floreana) are operative by end of Y1 to enable captive holding of target finch numbers:</p> <ul style="list-style-type: none"> ● 140 Medium tree finches ● 150 Small tree finches ● 140 Common cactus finches ● 200 Small ground finches ● 200 Medium ground finches <p>1.2 One aviary complex (on Santa Cruz) and one temporary holding aviary (on Floreana) are operative by end of Y1 to enable captive holding of target numbers (60 birds max) of Galapagos short-eared owls.</p> <p>1.3 Six at-risk bird species are effectively protected during the eradication with at least 90% survival of captive held populations.</p> <p>1.4 Post-release monitoring (radio tracking and observational counts) of captive held Darwin's finches demonstrates survival in the wild with at least 30% of released individuals observed 1 year post release (Y3 Q4).</p> <p>1.5 At least 5 local GNPD staff trained in wildlife monitoring techniques in Y1 and Y3.</p> <p>1.6 Changes in abundance/population of 5 non-target native species groups (Darwin's finch; paint-billed crane; water birds; reptiles; Galapagos petrel) pre (Y1) and post eradication (Y3) quantified.</p>	<p>1.1 Infrastructure compliance reports indicating that aviary infrastructure is operative; photographs.</p> <p>1.2 Infrastructure compliance reports, photographs</p> <p>1.3 Captive holding reports.</p> <p>1.4 Post-release monitoring reports</p> <p>1.5 Training records disaggregated by gender.</p> <p>1.6 Survey reports</p>	<p>Enabling conditions to establish the infrastructure required are in place (e.g. access to Floreana Island and construction materials arrived from the mainland without any issues).</p> <p>The tools and methods implemented will be effective to maintain a healthy captive population of Darwin Finches and short-eared owls and ensure their survival while in captivity.</p> <p>The radio-tags deployed for post-release monitoring of Darwin finches work appropriately and remain in place (do not fall off the bird) for the duration of their battery life.</p> <p>Trained staff remain engaged and motivated to pursue the wildlife monitoring efforts throughout the project.</p> <p>Existing programs to monitor Medium-tree finch on Floreana will continue for the foreseeable future.</p>

	1.7 Increased abundance, distribution or breeding success is documented for key indicator species including Galapagos petrel, reptiles (lava lizards, geckos) by end of Y3 cf. pre-eradication baseline.	1.7 Survey reports	
<p>Output 2</p> <p>Conservation measures (invasive predator eradication and nest treatment) demonstrate a reduction in nest mortality for the Critically Endangered medium tree-finch by end of project</p>	<p>2.1 Zero (0%) nest (egg and chick) mortality due to invasive predators (rodents and feral cats) post-eradication (Y3) recorded for 100 surveyed nests (Yearly average 44.5% mortality due to predations).</p> <p>2.2 At least four local GNPD staff trained in injecting finch nests with insecticide (permethrin) in Y1 to support <i>Philornis downsi</i> control before and after invasive predator removal from Floreana.</p> <p>2.3 At least 20 medium tree-finch nests are successfully treated with permethrin insecticide to control against <i>Philornis downsi</i> maximizing fledgling success in Y2 and Y3.</p> <p>2.4 Total brood loss from <i>P. downsi</i> would go from 32.4% to 0% but partial brood loss may drop from 13% to 5% for medium tree-finch nests treated for <i>Philornis downsi</i> in treatment years (Y2 and Y3).</p>	<p>2.1 Survey reports</p> <p>2.2 Training reports, disaggregated by gender.</p> <p>2.3 Field reports to the GNPD indicating the treatment of Darwin's finches' nests with insecticide; photographs.</p> <p>2.4 Nest survey reports</p>	<p>No extreme weather events (e.g. El Niño event) will occur that will affect the removal of invasive predators on Floreana and the recovery of at-risk species.</p> <p>Removal of invasive predators is completed successfully.</p> <p>Existing programs to monitor Medium-tree finch nesting on Floreana will continue for the foreseeable future.</p> <p>Trained staff can find and identify active medium tree finch nests to inject with insecticide against <i>Philornis</i>.</p> <p>Trained persons remain engaged and motivated to pursue the treatment of active nests with insecticide.</p>
<p>Output 3</p> <p>Floreana community (46% women) have increased self-sustainability in livestock management, animal feed production and harvest management and have shared lessons with 3 other islands/communities in Galapagos.</p>	<p>3.1. One 2-month community training session for 40 people on balanced feed preparation using local resources and use of equipment in Y1.</p> <p>3.2 All community households dedicated to livestock farming on Floreana (22 households, 40 persons) are trained in livestock feeding management practices (e.g. balanced feed and silage production) by end of Y1.</p>	<p>3.1 Training and progress report</p> <p>3.2 Training and progress report</p>	<p>Community members willing to engage in sustainable livestock feeding management practices training and implementation at each farm.</p> <p>No extreme or unusual weather conditions affect the production of agricultural products to be utilized for the development of balanced feed for livestock during the implementation.</p>

	<p>3.3 All farmers (40 persons, 70% women managers) in Floreana have implemented and tried the sustainable livestock feeding management practices learned on their farms by mid Y2.</p> <p>3.4 Import of livestock feed from mainland Ecuador reduced by 50% due to producing nutritionally balanced livestock feed locally resulting in average savings of \$882USD per year/farmer (approx. \$17,640/year for all 22 farming households) by the end of Y3.</p> <p>3.5 All farmers (40 persons, 70% women managers) trained in improved harvest management practices by end Y1 and provided ongoing technical assistance throughout the project.</p> <p>3.6 By the end of Y3 at least five women farmers from Floreana travel once (for 1 week) to other three inhabited islands within the Galapagos archipelago to develop knowledge on other agricultural practices, adding value to products and exchange knowledge with other women farmers.</p>	<p>3.3 Survey will document number of farmers by gender that have implemented and tried the new livestock feeding management practices.</p> <p>3.4 Farmers' survey will document the reduction on animal feed importation from mainland Ecuador.</p> <p>3.5 Training and progress reports</p> <p>3.6 Records of community meetings and focus group surveys with women.</p>	<p>Support from the Ecuadorian Ministry of Agriculture (MAG) will be maintained to provide technical assistance to the farmers while implementing the new livestock management and feeding practices.</p>
<p>Output 4 Floreana community livelihoods become more resilient and food security improved through adoption of sustainable livestock management and improved harvest management practices by ≥75% farmers and eradication of invasive rodents.</p>	<p>4.1 Seven piggeries are built and operative by the end of Y1 for managing risks to pigs during the invasive predator removal on Floreana and enhancing sanitary measures for meat production.</p> <p>4.2 Seventy-five percent of Floreana farmers (70% women) increase production of livestock products (e.g. meat, eggs, milk) by ≥30% above baseline (start of project) to supply the local and tourism demand by the end of Y3.</p>	<p>4.1 Infrastructure compliance reports indicating that piggeries infrastructure construction has been completed and donation agreements signed by each farmer receiving a piggery. Photographs.</p> <p>4.2 Farmer's production survey</p>	<p>Enabling conditions to establish the infrastructure required are in place (e.g. access to Floreana island and construction materials arrived from the mainland without any issues).</p> <p>Community members willing to engage in sustainable livestock feeding and harvest management practices training and implementation at each farm.</p> <p>Removal of invasive predators is completed successfully.</p>

	<p>4.3 Zero livestock losses due to baiting occur during the removal of invasive predators from Floreana in Y2.</p> <p>4.4 Crop damage by rodents will be reduced to zero by the end of Y3, having an estimated savings of \$800-1500 USD per year/farmer.</p> <p>4.5 Agricultural produce loss from harvest to consumer is reduced to 15-20% (currently c.50% lost) by the end of Y3 through adoption of improved harvest management practices, having an estimated savings of \$6000-8000 USD per year/farmer.</p>	<p>4.3 Farmers' livestock and crop production survey reports</p> <p>4.4 Farmers' livestock and crop production survey reports</p> <p>4.5 Farmer's crop production and sales survey reports</p>	
<p>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) Output 1. Six at-risk species successfully held in captivity (≥90% survival) during eradication of invasive predators from Floreana and impact of eradication on five key wildlife groups understood (pre vs post eradication surveys).</p>			
<p>Activities</p> <p>1.1 Undertake full maintenance of aviaries, establish temporary owl enclosure on Floreana and purchase and install in the aviaries all necessary fixtures and fittings prior to capture of birds (finches and owls) and secured captive holding supplies (Y1)</p> <p>1.2 Work with GNPD to complete permitting requirements and secure permits to proceed with import of finch and owl diet supplies purchased overseas or in mainland Ecuador and proceed with project implementation (Q1 Y1).</p> <p>1.3 Capture requisite numbers of finches of each species from lowland and highland sites and bring into captivity following finch mitigation plan (May-September Y2)</p> <p>1.4 Carry out daily husbandry (feeding, cleaning, health checks) on all finches held in captivity with weekly reports to Durrell (May-January Y2)</p> <p>1.5 Undertake weekly maintenance checks and predator control at finch aviaries (May-January Y2)</p> <p>1.6 Once conditions allow, and environment is safe, fit subset of finches with radio transmitters and release finches from aviaries (Q4 Y2)</p> <p>1.7 Undertake post-release monitoring of released finches (Y2 and Y3)</p> <p>1.8 Recruit two local positions (veterinarian and mouse farm keeper) to support the captive owl programme (Q1 Y2)</p> <p>1.9 Establish a rodent facility for producing rodents to feed owls during captivity (Q1 Y2) and conduct daily rodent husbandry (feeding, breeding and cleaning) Q1 Y2 through Q4 Y3 and beyond.</p> <p>1.10 Capture owls from Floreana island and hold them at a temporary captivity facility on Floreana until a sufficient number of owls are captured for transport to Santa Cruz where the owl aviaries are located (August-September Y2)</p> <p>1.11 Carry out daily husbandry (feeding, cleaning, health checks) on all owls held in captivity with weekly reports to Island Conservation for the first 6 months (Q2 to Q3 Y2) and then monthly reports throughout the remainder of the captive period (Q4 Y2 to Q4 Y3 and beyond).</p> <p>1.12 Finalise monitoring plans for 5 non-target species groups e.g., Darwin's finch; paint-billed crane; water birds; reptiles; Galapagos petrel (Y1).</p> <p>1.13 Train local GNPD staff in monitoring techniques for key non-target species (Y1, Y2, Y3)</p> <p>1.14 Undertake pre- (Y1) and post-eradication (Q4 Y2 and Y3) baseline surveys of key non-target species.</p>			

Output 2. Conservation measures (invasive predator eradication and nest treatment) demonstrate a reduction in nest mortality for the Critically Endangered medium tree-finch by end of project.

Activities

- 2.1 Carry out annual nest monitoring of medium tree-finch nests.
- 2.2 Train local GNPD staff in nest treatment and monitoring protocols of medium tree-finch (Y1)
- 2.3 Carry out nest treatment of medium tree-finch nests by GNP with support of Universitat Wien staff (Q4 Y1, Q4 Y2 and Q4 Y3)
- 2.4 Data collection analysis, nest treatment and monitoring reports are completed by project partners (Q4 Y2 and Y3).

Output 3. Floreana community (46% women) have increased self-sustainability in livestock management, animal feed production and harvest management and have shared lessons with 3 other islands/communities in Galapagos.

Activities

- 3.1 Project partners (Jocotoco) will work with each farmer to establish 2ha of their land to produce pastures and animal fodder, as well as other agricultural resources that can be used for preparing animal feed (Q1 and Q2 Y1).
- 3.2 Project partners (Jocotoco) will work with each farmer to set an irrigation system at each farm to support agricultural productivity (Q2 Y1)
- 3.3 Identify and recruit harvest and livestock management consultants to train Floreana community (Q1, Y1)
- 3.4 Conduct in-farm training on the use of the new equipment, preparing nutritionally balanced, locally produced livestock feed, and managing crop harvests (Q3-Q4 Y1)
- 3.5 Floreana farmers implement livestock and harvest management practices learned during training, evaluate results and make necessary adjustments to ensure uptake of these techniques (Y2)
- 3.6 Floreana farmers incorporate and maintain long term livestock and harvest management practices learned during project implementation (Y3 and onwards)
- 3.7 Floreana women farmers (at least five) with support of partners (Jocotoco) undertake exchanges on the “Floreana” experience and acquire ideas for improving commercialization of their products with agricultural sectors of Santa Cruz and San Cristobal Islands (Y3).

Output 4. Floreana community livelihoods become more resilient and food security improved through adoption of sustainable livestock management and improved harvest management practices by $\geq 75\%$ farmers and eradication of invasive rodents.

Activities

- 4.1 Infrastructure plans are developed in conjunction with Floreana pig farmers laying out the details for the construction of the piggeries covering aspects to manage risk during invasive predator removal and enhancement of sanitary measures for animal and meat production (Q1 Y1)
- 4.2 Local construction team is secured to build the piggeries in Y1 following the infrastructure plans and needs from farmers.
- 4.3 All infrastructure required for pigs, chickens and cattle is completed (Y1) and livestock is placed in captive holding to prevent any losses from invasive predator removal.
- 4.4 Undertake baseline surveys of Floreana farmers current livestock and harvest management practices on Floreana Island and associated costs (Q1 Y1).
- 4.5 Floreana farmers implement livestock management practices learned during training to improve livestock production and manage risks (Y2 and Y3) with support of project partners.
- 4.6 Jocotoco, with support of external consultants and Floreana farmers, develop a manual of agricultural best practices for Floreana Island (Q1 Y2).
- 4.7 Floreana farmers implement harvest management practices laid out in manual to reduce loss of produce from harvest to consumer (Y2 and Y3).
- 4.8 Conduct Floreana farmer’s livestock and crop surveys to evaluate results of implementing improved livestock and harvest management practices (Q4 Y3).

Annex 3: Standard Indicators

Table 1 Project Standard Indicators

DI Indicator number	Name of indicator using original wording	Name of Indicator after adjusting wording to align with DI Standard Indicators	Units	Disaggregation	Year 1 Total	Year 2 Total	Year 3 Total	Total to date	Total planned during the project
DI-A01	At least 5 local GNPD staff trained in wildlife monitoring techniques in Y1 and Y3	Number of people from key national stakeholders receiving training in wildlife monitoring techniques	People	Gender	3	5		8	5
DI-A01	All community households dedicated to livestock farming on Floreana (22 households, 40 persons) are trained in livestock feeding management practices (e.g. balanced feed and silage production) by end of Y1. All farmers (40 persons, 70% women managers) trained in improved harvest management practices by end Y1 and provided ongoing technical assistance throughout the project.	Number of people from local communities who have received training in livestock feed management practices and harvest management	People	Gender	39			39	40
DI-A03	At least 5 local GNPD staff trained in wildlife monitoring techniques in Y1 and Y3	Number of local/national organisations with improved capability and capacity as a result of project.	Number	Organisation Type	1	1		2	1
DI-A06	Import of livestock feed from mainland Ecuador reduced by 50% due to producing nutritionally balanced livestock feed locally resulting in average savings of \$882USD per year/farmer (approx. \$17,640/year for all 22 farming households) by the end of Y3.	Number of people with improved access to services or infrastructure for improved well-being.	Number	Gender	0	0		0	66 (based on 22 households at av. 3 persons/household)
DI-C02	Changes in abundance/population of 5 non-target native species groups (Darwin's finch; paint-billed crane; water birds; reptiles; Galapagos petrel) pre (Y1) and post eradication (Y3) quantified.	Number of new conservation or species stock assessments published.	Number	Taxa	0	0		0	5

Table 2 Publications

Title	Type (e.g. journals, best practice manual, blog post, online videos, podcasts, CDs)	Detail (authors, year)	Gender of Lead Author	Nationality of Lead Author	Publishers (name, city)	Available from (e.g. weblink or publisher if not available online)

Annex 4: Onwards – supplementary material (optional but encouraged as evidence of project achievement)

List of Annexes from Island Conservation:

- Report to Galapagos National Park documenting short-eared owl activities and current health status of birds maintained in captive holding. (Document in Spanish).
- Report to Galapagos National Park documenting monitoring conducted in July 2023 on Floreana and Española Islands to establish a pre-eradication baseline dataset for this project to document how the terrestrial restoration efforts to remove invasive species will impact the surrounding marine ecosystems and the wildlife that call them home. (Document in Spanish)
- Report to Galapagos National Park documenting monitoring conducted in January 2024 on Floreana to monitor the impact of El Nino event on seabirds and marine iguanas. (Document in Spanish).
- Report of construction for short-eared owl temporary aviary on Floreana and for installing ceiling mesh on Santa Cruz Island aviary.

Checklist for submission

	Check
Different reporting templates have different questions, and it is important you use the correct one. Have you checked you have used the correct template (checking fund, type of report (i.e. Annual or Final), and year) and deleted the blue guidance text before submission?	
Is the report less than 10MB? If so, please email to BCF-Reports@niras.com putting the project number in the Subject line.	
Is your report more than 10MB? If so, please discuss with BCF-Reports@niras.com about the best way to deliver the report, putting the project number in the Subject line.	
Have you included means of verification? You should not submit every project document, but the main outputs and a selection of the others would strengthen the report.	
If you are submitting photos for publicity purposes, do these meet the outlined requirements (see Section 16)?	
Have you involved your partners in preparation of the report and named the main contributors	
Have you completed the Project Expenditure table fully?	
Do not include claim forms or other communications with this report.	