



Effective Conservation of Protected Areas of Galapagos, through Strengthening of Control and Surveillance of the Galapagos Marine Reserve and the Eradication of Invasive Predators from Floreana Island

Part I: Project Information

GEF ID

10807

Project Type

MSP

Type of Trust Fund

GET

CBIT/NGI

CBIT No

NGI No

Project Title

Effective Conservation of Protected Areas of Galapagos, through Strengthening of Control and Surveillance of the Galapagos Marine Reserve and the Eradication of Invasive Predators from Floreana Island

Countries

Ecuador

Agency(ies)

CAF

Other Executing Partner(s)

Island Conservation

Executing Partner Type

CSO

GEF Focal Area

Biodiversity

Taxonomy

Gender Mainstreaming, Focal Areas, Gender Equality, Capacity, Knowledge and Research, Innovation, Training, Knowledge Generation, Biodiversity, Protected Areas and Landscapes, Coastal and Marine Protected Areas, Terrestrial Protected Areas, Species, Threatened Species, Financial and Accounting, Conservation Finance, Influencing models, Deploy innovative financial instruments, Strengthen institutional capacity and decision-making, Demonstrate innovative approaches, Stakeholders, Beneficiaries, Type of Engagement, Partnership, Participation, Consultation, Information Dissemination, Civil Society, Community Based Organization, Non-Governmental Organization, Private Sector, Financial intermediaries and market facilitators, Communications, Awareness Raising, Local Communities, Gender results areas, Capacity Development, Participation and leadership, Gender-sensitive indicators, Knowledge Exchange, Field Visit, Learning, Indicators to measure change

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 0

Climate Change Adaptation

Climate Change Adaptation 0

Submission Date

3/26/2021

Expected Implementation Start

10/15/2021

Expected Completion Date

10/14/2026

Duration

60 In Months

Agency Fee(\$)

160,183.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
BD-2-6	Address direct drivers to protect habitats and species through the Prevention, Control and Management of Invasive Alien Species	GET	1,126,809.00	5,561,100.00
BD-2-7	Address direct drivers to protect habitats and species and Improve financial sustainability, effective management, and ecosystem coverage of the global protected area estate	GET	653,008.00	8,018,900.00
Total Project Cost(\$)				13,580,000.00

B. Project description summary

Project Objective

To safeguard the biodiversity of Galapagos Protected Areas by managing threats to terrestrial and marine biodiversity

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
1. Targeted eradication of invasive vertebrate species	Investment	1.1 Invasive rodents (<i>Rattus rattus</i> and <i>Mus musculus</i>) and feral cats (<i>Felis catus</i>) are eradicated from Floreana Island, enabling the recovery and protection of 61 IUCN Red List threatened species, as well as vulnerable ecosystems, on a 17,253 ha island	Output 1.1.1 All infrastructure in place and preparations completed, ensuring readiness for a safe and effective eradication process Output 1.1.2 Operational plan for invasive rodent and feral cat eradication is fully implemented Output 1.1.3 Monitoring and information systems are developed and used to confirm target species eradications	GET	1,012,800.00	4,961,100.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
2. Marine patrolling and enforcement	Investment	2.1 The Marine Protection System (MPS) is implemented , protecting critical ecosystems within the Galapagos Marine Reserve from the threat of illegal fishing	2.1.1 Improved equipment to implement control and surveillance 2.1.2 Skills of park rangers and DPNG legal department strengthened in control and surveillance techniques of the RMG	GET	539,000.00	7,418,900.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing(\$)
3. Sustainability , knowledge, monitoring and evaluation	Technical Assistance	3.1 Sustainability and knowledge are enhanced through development of a financial risk reduction mechanism, capture of lessons learned and monitoring and evaluation	3.1.1 Roadmaps for an insurance scheme designed to reduce financial risks associated with reinvasion by alien invasive species and for issuance of Galapagos biodiversity green bonds	GET	69,892.00	100,000.00
			3.1.2 Effective management of knowledge, based on learning and dissemination of project lessons and innovations			
			3.1.3 Project monitored and evaluated			
					Sub Total (\$)	1,621,692.00
						12,480,000.00

Project Management Cost (PMC)

GET	158,125.00	1,100,000.00
Sub Total(\$)	158,125.00	1,100,000.00

Project Management Cost (PMC)

Total Project Cost(\$)	1,779,817.00	13,580,000.00
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C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Recipient Country Government	Galapagos National Park	In-kind	Recurrent expenditures	5,911,209.00
Donor Agency	KFW	Grant	Investment mobilized	3,600,000.00
Civil Society Organization	Island Conservation	In-kind	Recurrent expenditures	500,000.00
Donor Agency	Blue Action Fund (BAF)	Grant	Investment mobilized	3,468,791.00
GEF Agency	CAF	Grant	Investment mobilized	100,000.00
Total Co-Financing(\$)				13,580,000.00

Describe how any "Investment Mobilized" was identified

Grant funding from KFW in this amount is being allocated to the Floreana eradication work out of an overall 15 million Euro bilateral grant from the Government of Germany. Support is being channeled through KFW. The Blue Action Fund has approved a project to strengthen conservation in Galapagos through improved control and surveillance of the MPA, developing specific management plans and supporting local communities.

D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
CAF	GET	Ecuador	Biodiversity	BD STAR Allocation	1,779,817	160,183
Total Grant Resources(\$)					1,779,817.00	160,183.00

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)PPG Required **false****PPG Amount (\$)****PPG Agency Fee (\$)**

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
				Total Project Costs(\$)	0.00	0.00

Core Indicators

Indicator 1 Terrestrial protected areas created or under improved management for conservation and sustainable use

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
0.00	789,088.00	0.00	0.00

Indicator 1.1 Terrestrial Protected Areas Newly created

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
0.00	0.00	0.00	0.00

Name of the Protected Area	WDP A ID	IUCN Category	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
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Indicator 1.2 Terrestrial Protected Areas Under improved Management effectiveness

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
0.00	789,088.00	0.00	0.00

Name of the Protected Area	WDP A ID	IUCN Category	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)	METT score (Baseline)	METT score (Achieved at CEO Endorsement)	METT score (Achieved at MTR)
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Name of the Protected Area	WDP ID	IUCN Category	Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)	METT score (Baseline at CEO Endorsement)	METT score (Achieved at MTR)	METT score (Achieved at TE)
Akula National Park Galapagos National Park	125 689 187	Select National Park		789,088.00		76.00			

Indicator 2 Marine protected areas created or under improved management for conservation and sustainable use

Ha (Expected at PIF)	Ha (Expected at CEO Endorsement)	Ha (Achieved at MTR)	Ha (Achieved at TE)
0.00	13,300,000.00	0.00	0.00

Indicator 2.1 Marine Protected Areas Newly created

Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
0.00	0.00	0.00	0.00

Name of the Protected Area	WDP ID	IUCN Category	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)

Indicator 2.2 Marine Protected Areas Under improved management effectiveness

Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)
0.00	13,300,000.00	0.00	0.00

Name of the Protected Area	WDP ID	IUCN Category	Total Ha (Expected at PIF)	Total Ha (Expected at CEO Endorsement)	Total Ha (Achieved at MTR)	Total Ha (Achieved at TE)	METT score (Baseline at CEO Endorsement)	METT score (Achieved at MTR)	METT score (Achieved at TE)
Akula National Park	125689	Select Protected area with sustainable use of natural resources	11753	13,300,000.00			73.00		

Indicator 11 Number of direct beneficiaries disaggregated by gender as co-benefit of GEF investment

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	299		
Male	992		
Total	1291	0	0

Part II. Project Justification

1a. Project Description

1a. Project Description.

1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description)

The Galapagos Islands (see section 1b) are a volcanic archipelago formed 3-5 million years ago. Located at the confluence of three eastern Pacific currents, the Galapagos are a ?melting pot? for a large diversity of marine life. They include 13 large islands and 100 smaller islands and islets that together comprise 7,880 km² of land. Situated just below the equator, the islands are 1,000 km off the coast of Ecuador. The islands? equatorial climate, highly varied and rugged terrain, and extreme geographic isolation have contributed to the evolution of a rich array of terrestrial plants and animals that are found nowhere else.

Despite being relatively young in geological terms, the Galapagos Islands host a diverse biota; scientists have documented more than 1,300 species unique to the archipelago. Exploration of deep-sea communities in the archipelago continues to reveal species new to science.

Unlike other oceanic archipelagos, the ecological and evolutionary processes characteristic of the Galapagos Islands have until recently been minimally affected by human activities; more than 95% of species are still extant. The persistence of the rich, unique biodiversity made famous by Charles Darwin has positioned the Galapagos Islands as one of the most renowned natural sites in the world. They are one of the ?jewels? of Ecuador and a top conservation priority. All of the marine and coastal environs (13,300,000 ha) and nearly 97% of the land area (761,844 ha) in the Galapagos archipelago are under at least one form of protection.^[1]¹

Terrestrial taxa emblematic of the Galapagos Islands include eleven species of giant tortoise (e.g., the Galapagos tortoise, *Chelonoidis nigra* from Floreana Island), three species of land iguanas (e.g., the Galapagos land iguana, *Conolophus subcristatus*), the most northerly species of penguin in the world (Galapagos penguin, *Spheniscus mendiculus*), flightless cormorants (*Phalacrocorax harrisi*), Darwin?s finches (family *Geospizinae*) and Galapagos mockingbirds (*Mimus* spp.) made famous in Darwin? publications, along with seemingly-fanciful plants (e.g., giant daisy trees, *Scalesia* spp.).

Galapagos has a unique combination of geographical isolation, bathymetry and confluence of oceanic currents that together create five bioregions. It boasts at least 3,502 marine species, with 614 (18%) considered endemic[2]². High-profile marine species include: sharks (e.g., whale sharks, (*Rhincodon typus*)), rays (e.g., manta rays, (*Manta birostris*)), and cetaceans (e.g., killer whales, (*Orcinus orca*)). The most species-numerous groups are molluscs (780 spp.), fish (533 spp.), algae (333 spp.), *echinoderms* (200 spp.) and *polychaetes* (192 spp.). Endemicity rates are particularly high in coral fans (71%), cup corals (40%) and invertebrates (50%). Species new to science and new records of species are regularly being identified, especially as explorations in deeper waters occur. Groups that are considered likely to have high species richness yet remain poorly studied include algae, *Caridea* (shrimp), *Stenopodidea* (decapod crustaceans), *Bryozoans*, *Ascidians*, *Porifera* and *Meiofauna*.

In addition to the high diversity of species, globally important aggregations occur of critically endangered hammerhead sharks and vulnerable silky sharks, as well as Galapagos shark, Galapagos bullhead shark, white-tip reef shark and black-tip shark. Wolf and Darwin Islands, located in the northwest portion of the archipelago, are believed to be the ecological unit with the largest shark biomass on the planet, with an average of 17.5 tons per hectare[3]³. Endangered whale sharks aggregate at certain times of the year in these northern islands. In the wider surrounding ocean, schools of large pelagic fish are found, such as the vulnerable blue marlin, as well as yellowfin tuna, sailfish, broadbill swordfish, shortbill spearfish, giant manta ray and pelagic stingray. *Elasmobranchs* (sharks, rays and chimaeras) are one of the most threatened groups of species on the planet.[4]⁴

Interactions between the Archipelago's terrestrial and marine biotas are unusually extensive. Many island species, e.g., marine iguanas (*Amblyrhynchus cristatus*) and Galapagos sea lions (*Zalophus wollebaeki*), are directly dependent on marine resources, while terrestrial ecosystems receive vital nutrients from marine inputs (e.g., guano from seabirds). In the Galapagos archipelago, terrestrial and marine life are inseparably linked.

These productive waters, and the islands themselves, also support critically endangered and endemic seabirds like the Galapagos petrel and waved albatross. Five bioregions support a suite of habitats from mangroves and coral reefs to open ocean. Several species of endemic seabirds are present and rely on healthy marine ecosystems for feeding and healthy terrestrial ecosystems for nesting. Seabirds like the Galapagos petrel and the waved albatross travel significant distances but nest only in specific sites of the Galapagos. Seabird abundance on invasive-predator-free islands and islets concentrate significant amounts of nutrients that shape terrestrial ecosystems and leach slowly back into the marine environment. These nutrients continue to support plankton production at times when marine upwelling ceases, resulting in abundant and significant concentrations of marine life.

The Galapagos Marine Reserve (RMG) (map presented in section 1b) was created in recognition of the high rates of globally significant biodiversity and densities of marine life present in the under-

waterscapes and within the surrounding waters. In recognition of its outstanding natural values, the area has been named a National Park, World Heritage Site and most recently a Blue Park.

The Government of Ecuador (GoE) created the Galapagos National Park Service (DPNG) in 1959 and designated the RMG in 1996. In acknowledgment of their global conservation value, the Galapagos Islands became the first World Heritage Site in 1978 and were designated as a United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and the Biosphere Reserve in 1984. However, largely due to threats posed by invasive alien species, UNESCO listed the Galapagos Islands as a World Heritage Site in Danger in 2007^[5]⁵. The World Wildlife Fund includes the Galapagos archipelago among the ?Global 200 Ecoregions,? thereby highlighting it as a priority for conservation^[6]⁶.

Within the Galapagos Islands, specific sites have additional protected area status. Birdlife International has designated ten distinct Important Bird Areas (IBAs) in the Galapagos archipelago: San Cristobal Island, Espa?ola Island, two satellite islands of Floreana Island (Champion and Gardner), Floreana Island, the uplands of Santa Cruz Island, Puerto Ayora, the southern wetlands of Isabela Island, the uplands of Isabela Island, coastal areas of Fernandina Island and western Isabela Island, and the uplands of Santiago Island^[7]⁷. The IBA status is intended to help prioritize funds and implement urgent actions within regional priority setting schemes.

The Alliance for Zero Extinction (AZE) identifies and prioritizes places around the world where multiple species evaluated as Endangered or Critically Endangered under IUCN criteria^[8]⁸ are restricted to a single site. National Alliances for Zero Extinction, representing partnerships of government agencies and non-government organizations, have been initiated to accelerate the protection of AZE sites in compliance with national commitments under the Convention on Biological Diversity (CBD). Within the Galapagos archipelago, AZE sites include: the coastal areas of Fernandina Island and western Isabela Island; Floreana Island; Floreana?satellite islands, Champion and Gardner; Espa?ola Island; and San Cristobal Island^[9]⁹. These AZE sites form the basis for the 10 Key Biodiversity Areas (KBAs) recognized for the Galapagos^[10]¹⁰.

Despite the various forms of protection status awarded to the Galapagos Islands, the archipelago remains extremely vulnerable to environmental change. Eighty of the archipelago?s native species are categorized as Critically Endangered on the IUCN Red List, and an additional 164 are considered threatened with extinction^[11]¹¹. The loss of individual species has profound, cascading impacts at the ecosystem level, particularly in cases where ecosystem processes, e.g., pollination and nutrient cycling, are compromised. The gradual decline in biodiversity has an adverse effect on human livelihoods

through the loss of: a) food and medicine supply, e.g., protein from fish, as well as plant medicines; b) ecosystem function and resilience, e.g., water purification, soil fertility, and storm protection, c) cultural norms, e.g., spiritual and aesthetic values, and d) income opportunities, e.g., ecotourism and artisanal fishing.

Environmental problems and threats to terrestrial and marine biodiversity

This section provides an overview of some of the key challenges facing terrestrial and marine biodiversity in the Galapagos Islands.

Terrestrial biodiversity and the threat from invasive alien species

The GoE's 5th National Report to the CBD[12]¹² identifies the main threats to Ecuador's terrestrial biodiversity as: loss and degradation of habitats, invasive alien species, wildlife trafficking, unsustainable hunting, pollution, climate change (including extreme weather events) and population growth. The country's marine environments are threatened by overfishing, habitat-destructive fishing practices, physical alteration of coastal and continental shelf habitats for development and land-based sources of pollution. All of the islands and associated marine ecosystems are adversely impacted by four inter-related threats: invasive alien species, climate change, population growth and expanding tourism[13]¹³.

The greatest threat to biodiversity in the Galapagos Islands is biological invasion[14]¹⁴. Invasive alien species are one of the most significant drivers of environmental degradation and species extinction worldwide and are generally considered the primary cause of biodiversity loss in island ecosystems[15]¹⁵. Globalization of trade, travel, and transport is greatly increasing the number and type of invasive alien species being moved around the world, as well as the rate at which they are moving. At the same time, changes in climate and land use are rendering some habitats, even the best protected and most remote natural areas, increasingly susceptible to biological invasion[16]¹⁶. In its 5th National Report to the CBD[17]¹⁷, the Government of Ecuador (GoE) identified strategic and timely actions to mitigate the adverse impacts of invasive alien species as priority conservation imperatives.

Hundreds of invasive alien species are already well established within the Galapagos archipelago. Some of these organisms arrived with seafarers more than 100 years ago, while others have been introduced, either deliberately or inadvertently, more recently. Despite the development of improved regulatory frameworks, the rate of non-native species introductions into the Galapagos archipelago has remained steady in recent decades:[18]¹⁸ On average, 27 species have been introduced per year for the past 40 years[19]¹⁹. So far, 1,579 alien terrestrial and marine species have been introduced to Galapagos by humans. Of these, 1,476 have become established. Almost half were intentional introductions, most of which were plants. Most unintentional introductions stem from: a) arrival on plants and plant associated material, b) transport vehicles, and c) commodities (in particular fruit and

vegetables). The number of alien species known to be present in Galapagos is positively and closely correlated with both the total number of residents and the number of tourist visitations^[20]²⁰.

The Galapagos Biosecurity Agency (ABG) is responsible for preventing the entry and spread of invasive species. The ABG's effectiveness has been limited by staff size and capacity, too many entry points for vessels and air traffic to enter the Galapagos archipelago without adequate inspection, a lack of advanced technologies at all ports to make screening of cargo more effective and timely, and failure of the public/tourists to understand the importance of biosecurity and thus comply with rules and regulations. However, with support from a GEF-6 project for the Galapagos,^[21]²¹ a number of improvements are taking shape, including:

- Acquisition and installation of pest detection devices at maritime ports of entry / departure;
- Training marine port inspectors in the effective use of these devices;
- Creation of a pest interception database to allow for data entry at the point of pest interception;
- Supplying maritime port inspectors with hand-held data entry devices; and
- Training inspectors to effectively input, analyze and report on pest-intercept data.

Examples of invasive alien species that have already had substantial impacts in the Galapagos Islands include: black rats (*Rattus rattus*), house mice (*Mus musculus*), feral cats (*Felis catus*), feral goats (*Capra hircus*), feral donkeys (*Equus asinus*), fire ants (*Solenopsis geminata* and *Wasmannia auropunctata*), yellow fever mosquito (*Aedes aegypti*), Mediterranean fruit fly (*Ceratitis capitata*), *Philornis downsi*, blackberry (*Rubus niveus*), and grape algae (*Caulerpa racemosa*).

Surveys of invasive alien species in the Galapagos Islands indicate that at least:

- Nineteen (19) species of non-native vertebrates are established (9 species of mammals, 4 species of birds, 3 species of reptiles, 1 species of fish, and 1 species of amphibian);^[22]²²
- Five hundred and forty-three (543) terrestrial invertebrate species have been introduced, of which 55 are considered harmful or potentially harmful to native biodiversity;^[23]²³
- Six hundred and forty (640) plant species have been introduced, most with unknown potential impacts;^[24]²⁴ and
- Fifty-three (53) marine invasive alien species are now reported present (more are being identified as part of baseline studies).^[25]²⁵

Invasive rodents and feral cats have had particularly pervasive impacts on endemic birds, small mammals, small reptiles, and giant tortoises. These impacts can have ecosystem-wide ramifications. For example, when invasive rodents feed on giant tortoise eggs and hatchlings, they reduce the number of tortoises available to spread seeds (through their excrement) and ?plant? the next generation of native trees and shrubs. As canopy cover declines, so do the populations of understory plants that require shading from the harsh tropical sun. The loss of understory vegetation makes landscapes more vulnerable to soil erosion and contributes to declines in soil fertility through mineral leaching. This impairs soil fertility and undermines the capacity of landscapes to be resilient to further perturbations (e.g., extreme weather events, climate change).

The persistence of invasive species like rodents and feral cats can also block opportunities to rehabilitate ecosystems. This is the case in Floreana, where ambitions to establish a self-sustaining population of tortoises and other extirpated species cannot move forward until these predators are

eradicated. In this case, eradication represents a necessary enabling condition for ecological rehabilitation via species reintroduction.

Table 1 below summarizes the impacts of invasive rodents and feral cats on island ecosystems in the Galapagos and their impacts on achieving UN Sustainable Development Goals (SDGs) and **Figure 1** presents a map of air and sea pathways between the Galapagos, the mainland and the islands.

Table 1. Impacts of invasive rodents and feral cats on UN Sustainable Development Goals

Impacts	Rodents	Feral cats
Food Security SDG 2	<p>Deplete food supplies by destroying in-field crops, depredating stored food/seed, and faecal contamination</p> <p>Prey on chicks and eggs of poultry</p> <p>Consume marine resources that the residents of Floreana island directly depend on for food</p>	<p>Prey on poultry</p> <p>Are the critical host for <i>Toxoplasma gondii</i>, which can infect and be lethal to livestock</p>
Human Health SDG 3	<p>Contaminate dwellings with excrement</p> <p>Serve as primary vectors of disease and hosts for parasites, including lymphocytic chorio-meningitis, plague, leptospirosis, hantavirus, and salmonellosis.</p> <p>Presence of rats increases stress levels and frequency of rat sightings and impacts are correlated with increased levels of stress and mental health issues^{[26]²⁶}</p>	<p>Contaminate areas near dwellings with excrement</p> <p>Primary vectors of disease and hosts for parasites, including toxoplasmosis</p>
Gender Equality SDG 5	Women are disproportionately affected by invasive rodents on Floreana Island, as agricultural production is impacted 40-60% by rodents, and 70% of farms are women-led and are a primary source of income for women.	Affect women through loss of pregnancies from toxoplasmosis.

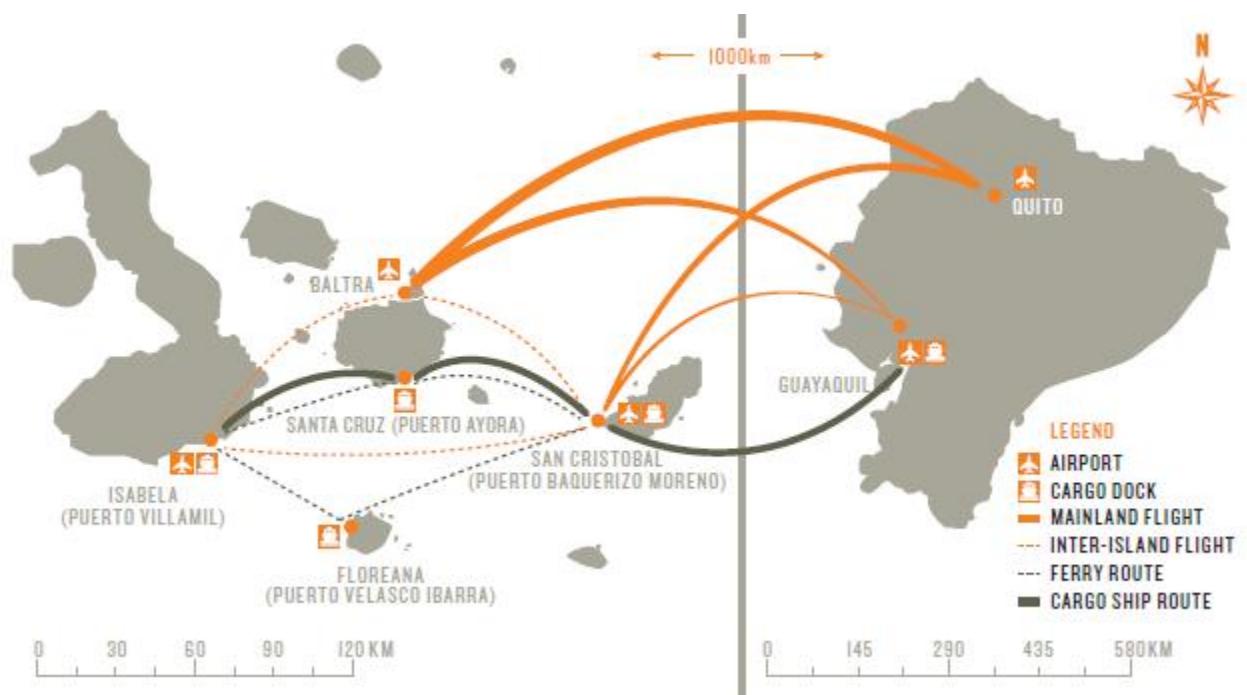
Impacts	Rodents	Feral cats
Clean water SDG 6	Contaminate water with faeces, urine, corpses. Water is a pathway for zoonotic disease transmission from rodents to humans and their livestock.	Contaminate water with faeces. Water is a pathway for zoonotic disease transmission (e.g. <i>Toxoplasma gondii</i>) from cats to humans and their livestock.
Biodiversity SDG 14 and 15	<p>Feed on the eggs of endemic birds and reptiles, as well as the fruit/seeds of endemic plants</p> <p>Prey on native insects, as well as small birds and reptiles through predation and disease, have contributed to the global extinction of at least 4 Galapagos endemic wildlife taxa, the local extinction of at least 17 endemic wildlife species and contributes to the threatened status of at least 65 IUCN red list threatened animal species.</p> <p>Contribute to fisheries decline by consuming inter-tidal species (e.g., Chiton) and endemic shellfish</p> <p>Disrupt biogeochemical cycles (e.g., guano deposition in highland forests)</p> <p>Support higher densities of introduced predators (e.g., feral cats), further exacerbating negative impacts on native wildlife</p>	<p>Prey on large numbers of native insects, birds, mammals, and reptiles</p> <p>Through predation, has contributed to the global extinction of at least four Galapagos endemic wildlife taxa, the local extinction of at least 17 endemic wildlife species and contributes to the threatened status of at least 14 IUCN red list threatened animal species</p> <p>Disrupt biogeochemical cycles (e.g., guano deposition in highland forests)</p> <p>Are the critical host for <i>Toxoplasma gondii</i>^[27], which can be lethal to wildlife.</p>

With respect to invasive alien species, Floreana Island, a 17,253 ha island in the south-central reaches of the archipelago, is of particular global interest. Partly because it is one of the oldest islands in the archipelago, Floreana has a higher rate of endemism (endemic species per km²) than the younger islands to the west. Due to its long history of human occupation (pirates and buccaneers began routinely visiting Floreana Island in the 1600s^[28]), Floreana's endemic species are among the most threatened in the world. The IUCN Red List currently includes 61 plant and animal species on Floreana Island that are considered Threatened (i.e. Vulnerable, Endangered or Critically Endangered)^{more} than any other Galapagos Island. This includes a higher concentration of IUCN Critically Endangered species (one per 17.2 km²) than for any other major Galapagos island. It also has the highest

concentration of IUCN threatened animals (one per 7.8 km²) of any Galapagos island where invasive vertebrates are present (unpublished analyses). Thirteen species have already gone locally extinct, primarily due to the impacts of invasive mammals. Experts have identified Floreana as one of the top five islands globally for preventing extinctions by removing invasive mammals[29]²⁹.

The human population on Floreana is highly dependent on local resources and nature-based tourism. Therefore, adverse impacts on biodiversity pose substantial threats to the local people. On the highlands of Floreana, invasive alien species (in combination with agriculture) have already led to the degradation of 38% of the humid vegetation zone, 2% of the transitional vegetation zone, and 0.5% of the arid lands[30]³⁰.

Figure 1: Map of air and sea pathways between the Galapagos, the mainland and the islands



Source: Wildaid 2013 (Quarantine chain).

Currently on Floreana, invasive rats cause agricultural crop losses of 40-60% of crops and up to 100% when no pest control measures are in place, causing food insecurity for subsistence farmers and other island inhabitants. Invasive species have caused the local extinction of at least 11 native species. Invasive predators are a primary threat to a further 55 species on Floreana considered threatened with extinction by IUCN, including seabirds such as the critically endangered Galapagos petrels, endangered Galapagos penguins, and green sea turtles[31]³¹. Zoonotic diseases from invasive predators affect inhabitants, their livestock and wildlife like Galapagos penguins and sealions. Feral cats prey on marine iguana hatchlings and juveniles, while invasive rats prey on their eggs and hatchlings. Invasive

predators on Floreana Island impact food security, sustainability of employment in agricultural and tourism industries and wildlife that are the basis for sustainable community tourism and the livelihood conditions of inhabitants and visitors alike.

Floreana represents a ?transformational opportunity? for invasive alien vertebrate eradication on human-inhabited islands. Because the island and its human population are smaller than the other inhabited islands in the Galapagos archipelago, and the biodiversity is already well-studied, Floreana offers the best opportunity for the DPNG and its partners to establish effective protocols for the eradication of invasive rodents and feral cats from inhabited islands. Once the eradication procedures are proven, they can be upscaled to the three remaining human-inhabited islands in the Galapagos archipelago and potentially hundreds of human-inhabited islands worldwide. The capacity to permanently eliminate invasive rodents and feral cats from islands with human populations will establish a new benchmark in island biodiversity conservation: species and ecosystems that could not previously be protected from the adverse impacts of invasive vertebrates can be protected and their viability secured over the long-term.

Feral goats, donkeys and pigs have already been removed from Floreana. Eradicating the remaining invasive rodents and feral cats would make Floreana free of invasive mammals. The eradication would also greatly benefit Floreana residents, whose agricultural livelihoods and tourism-based incomes are threatened. It would allow for the reintroduction of at least six threatened vertebrate species on Floreana Island, and as many as seven other Galapagos endemic species. Reintroductions would potentially include the Floreana giant tortoise (*Chelonoidis elephantopus*), Floreana mockingbird (*Mimus trifasciatus*), Galapagos rail (*Laterallus spilonotus*), Lava gull (*Larus fuliginosus*), and Galapagos hawk (*Buteo galapagoensis*).[32]³²

Marine biodiversity and the threat of illegal, unreported and unregulated fishing

Decades of serial exploitation have led to the depletion of fish stocks globally and have had significant impacts on the population status of emblematic and threatened species. Increases in fisheries regulation, risk mitigation and the creation of marine protected areas (MPAs) have provided multiple means to reverse trends in over-exploitation and recover populations of threatened species. However, non-compliant fishing activities, including illegal, unreported and unregulated (IUU) fishing[33]³³, continue to undermine national and regional efforts to manage fisheries resources and conserve marine biodiversity.

Overfishing has reduced biomass of most sharks and other large predatory fishes worldwide by over 90%[34]³⁴ and even remote locations have been severely impacted[35]³⁵. One in four species of cartilaginous fishes is now threatened with extinction due primarily to overexploitation and habitat loss[36]³⁶. The systematic removal of sharks from marine ecosystems has negative effects that propagate throughout the entire food web[37]³⁷. According to Schiller et al.[38]³⁸, the Ecuadorian fishing fleet has captured approximately 105,500 t of shark in the EEZ of the Galapagos Islands since 1950. However, there is evidence that foreign-flagged vessels belonging to Costa Rica, Colombia, and

Japan have also participated illegally in this fishery[39]³⁹. For this reason, Schiller et al. point out that the reconstructed catch represents only a fraction of the total undeclared catch of sharks obtained in the Galapagos. **Annex H** presents a list of 110 threatened marine species recorded in the Galapagos Marine Reserve.

Non-compliant fishing in the form of IUU fishing activity in the immediate vicinity of the RMG, as well as illegal entry, are impacting fisheries resources and threatened migratory species. Additionally, organised illicit fishing from artisanal vessels also occurs. IUU fishing activities present a major challenge for the management of fishery resources and biodiversity values inside and outside of the RMG, and distinct strategies are required to confront the threats posed by different IUU activities[40]⁴⁰.

In the Galapagos, surveillance data from 2017 to 2019 shows that an average of 153 industrial vessels annually were detected within 40 km outside of the RMG border. Of these, 13%[41]⁴¹ were non-compliant (i.e. entered RMG without authorization), and a total of two non-compliant vessels were intercepted. Out of these incursions into the RMG, 80% were from vessels using longlines, a method that has a high level of incidental catch of protected species (e.g. sharks, seabirds). In addition, in each of the past four years and particularly during the third trimester of 2020, Ecuadorian Navy surveillance detected a fleet of approximately 300-400 large international fishing boats stationed just outside of the Exclusive Economic Zone (EEZ) established around the RMG[42]⁴². Although technically outside of the RMG, the presence of such a large fleet generates constant pressure on marine resources, and migratory species are especially vulnerable.

Control and surveillance efforts conducted by the DPNG in conjunction with Navy, Coastguard and Police aim to ensure compliance with permitted activities. Conservation partners have been supporting the DPNG since 2000 to strengthen its marine control and surveillance capacity. In 2009, a vessel monitoring center was constructed and equipped, allowing the detection and monitoring of vessels that enter, and/or navigate within, the RMG. This is accomplished with the support of two main technologies: (i) a satellite-based Vessel Monitoring System (VMS), and (ii) a radio-based system known as the Automatic Identification System (AIS). The VMS was upgraded in 2015, incorporating the Themis Web platform and allowing for the integration of the two detection systems, i.e. AIS and VMS.

Today, the control center maintains real-time information on the identity, behavior, location and route of vessels that have AIS / VMS devices and that navigate within and around the marine reserve. However, technological approaches like AIS, VMS, and coastal radar systems remain vulnerable to tampering and impose substantial implementation and maintenance costs. Vessels trying to avoid detection can disable their AIS or VMS devices, report incorrect locations, or use false identification when registering. One of the challenges in detecting vessels that carry out illegal actions is when they tamper with identification transmitter devices.

Within the RMG, the DPNG monitors and regulates approximately 162 tourism vessels?including live-aboard cruises, diving tours, experiential fishing, and others?and 320 artisanal fishing vessels[43]⁴³. Most of this fleet has installed AIS/VMS technology to facilitate surveillance. However, an average of 40% of the registered artisanal fishing vessels were non-compliant, e.g. failed to turn on AIS, in the last 3 years[44]⁴⁴. The main difficulty is non-cooperative behaviour, including the use of non-permitted fishing techniques, disrespect of no take zones and fishing calendars (closed seasons). Partly as a result

of inshore IUU fishing by artisanal vessels, e.g. illicit fishing for sea cucumbers, marine biodiversity in these areas is also threatened.

In the last three years, the DPNG has made significant investments to strengthen patrol and interception capacity, and its fleet (oceanic, coastal and light aircraft) has been kept operational. In 2016, the DPNG, with the support of WildAid, analyzed the fleet and its effectiveness and developed a renewal plan. The analysis revealed that:

- 1) current vessels (oceanic and coastal) are nearing the end of their useful life;
- 2) the DPNG patrol fleet needs faster interceptor vessels and a technological system (e.g. radar) to enable detection and apprehension of non-collaborative vessels;
- 3) the investigation and intelligence-collecting capacity of the DPNG's control personnel is limited and provides only limited information on illegal activities, creating challenges in law enforcement and application of protocols related to prosecution and sanctions;
- 4) limited surveillance of the Galapagos artisanal fishing fleet occurs, as AIS devices are not used approximately 40% of the time, endangering the safety of life at sea and the application of fishing regulations; and
- 5) there is limited awareness among stakeholders of the location of zones within the RMG, complicating their compliance with relevant regulations.

Terrestrial: marine linkages and invasive species

Terrestrial invasive species negatively affect the sustainability of livelihoods, food security and biodiversity both on land and in the sea. Marine ecosystems are impacted in a variety of ways, including directly driving biodiversity loss, and through increasing erosion and sedimentation rates into the marine environment^[45]⁴⁵. These impacts result in: a) reduced marine productivity (e.g. reduced fish biomass); b) decreased coral reef health and ability to absorb shocks and recover from bleaching events; c) reduced effectiveness of mangrove systems in filtering sediment, creating nurseries for biodiversity and protecting systems from climate shocks; and d) near-shore systems contaminated with disease propagules such as toxoplasmosis. Ultimately, these stressors result in reductions of marine biodiversity, fish stocks and the presence of megafauna. Terrestrial invasive species negatively impact food security, and the resources that sustain livelihoods, including fishers, farmers and sustainable tourism operators working in the Galapagos. The significance of these links has been unveiled in the last decades, but is not widely understood and as such is explained in more detail below.

There are strong links between healthy terrestrial island ecosystems and marine productivity. Ecosystems that are rich in seabird guano nutrients promote concentrations of plankton, which are especially important during seasons in which upwelling is not occurring. Climate change scenarios indicate that upwelling duration and intensity will decrease at low latitudes^[46]⁴⁶ (e.g. Galapagos), increasing the relative contribution of seabird guano concentrations to the system. Introduced predators, such as rats, cause population reductions and extirpations of seabird populations (and other intertidal flora and fauna), reducing guano-derived nutrients in nearshore waters and decreasing their productivity^[47]⁴⁷. Lower plankton concentrations result in reduced fish stocks (required to sustain fisheries) and reduced concentrations of marine life, including megafauna such as manta rays, sharks and whales, which are critical to sustain the tourism industry.

Terrestrial invasive species also have significant impacts on coral reef health, reducing the reef's ability to absorb climate shocks and recover from bleaching events^{[48]⁴⁸, [49]⁴⁹}. Invasive rodents consume seeds and seedlings, modify forest composition, reduce vegetation coverage and increase erosion. Increased runoff leads to sedimentation and turbidity in marine systems. During major rainfall events, large sediment plumes are prevalent. Sediment plumes are carried on currents and deposited on the sea floor, altering the seafloor substrate. Sediment has complex effects on the ability of planktonic life-stages of corals^{[50]⁵⁰}, lobster and fish to successfully locate suitable habitat, as well as impacting on their post-settlement performance and, ultimately, recruitment success^{[51]⁵¹}. Under climate change scenarios, it is expected that rainfall will occur with increased intensity and frequency, increasing the scale of runoff events and magnifying the consequences.

In addition to sediments, runoff also carries with it faecal matter from invasive rats and feral cats. Feral cats are the definitive host for *Toxoplasma gondii*, which can infect and kill marine and terrestrial mammals (e.g. whales, sea lions, fur seals, people), and marine and land birds (e.g. Galapagos penguins)^{[52]⁵²}. Rats transmit *Leptospira* and other diseases that impact people and wildlife by contaminating freshwater.

Ultimately, invasive species impact tourism, fishing, health, and livelihoods of coastal communities in a suite of different ways. **Figure 2** below illustrates these.

Conversely, when invasive vertebrate species are removed, the negative impacts cease, threatened species and ecosystems recover^{[53]⁵³}, fish stocks rebound^{[54]⁵⁴}, agricultural production increases, resilience to climate change is increased and livelihoods are enhanced. Eradicating invasive mammals has been an essential strategy to secure these types of benefits in the Galapagos, with 43 eradications successfully implemented^{[55]⁵⁵}. Not surprisingly in light of the above, protected area management plans in Galapagos prioritize the eradication of invasive vertebrates and list them as the major threats to biodiversity for the protected areas. Invasive mammal eradications also contribute significantly to advancing Sustainable Development Goals^{[56]⁵⁶}.

Barriers to Addressing the Environmental Problems and Root Causes

Many of the barriers that are typical of efforts to control and eradicate invasive alien species (e.g., lack of political support; insufficient collaboration and public participation; ineffective policy, legislation, or other frameworks) have already been overcome in the Galapagos archipelago. Positive steps taken include:

- Global recognition of the Galapagos Islands as an area of substantial biological importance and a highly valued tourist destination;
 - Leadership of high-level political officials across environment, agriculture, and human health sectors who are already well aware of the adverse impacts that invasive alien species have on biodiversity and human livelihoods at international, national, and subnational scales;
-

- Long and successful history of scientific and technical cooperation with other governments, non-governmental institutions (NGOs), inter-governmental organizations (IGOs) and academic institutions;
- Substantial financial investment in conservation in the Galapagos archipelago by the GoE, various international donors and collaborating NGOs;
- A Galapagos special law (LOREG), management authorities (DPNG, ABG), a plan (Plan for the Management of Invasive Species 2019-2029), and a fund (Fund for the Control of Invasive Species in Galapagos (FEIG)) explicitly committed to preventing the introduction and mitigating the impacts of invasive alien species; and
- The substantial experience that the GoE and its partners have in the design and implementation of large-scale, multi-faceted conservation projects in the Galapagos Islands.

The remaining barriers to the eradication and control of invasive alien species and to the control of IUU fishing are largely technical and financial in nature. Many of these barriers are particularly challenging to overcome in the Galapagos archipelago due to Ecuador's socio-economic status as a developing country, wide dispersion of the islands across the archipelago and their often steep and rugged terrain which hinder accessibility, the logistical difficulties inherent in securing island borders, the rapid increase in trade and tourism upon which the islands' economy depends (discussed above), and the urgency and large-scale of action required to secure species that are on the brink of extinction, such as the critically endangered Medium tree finch, which is endemic to Floreana Island.

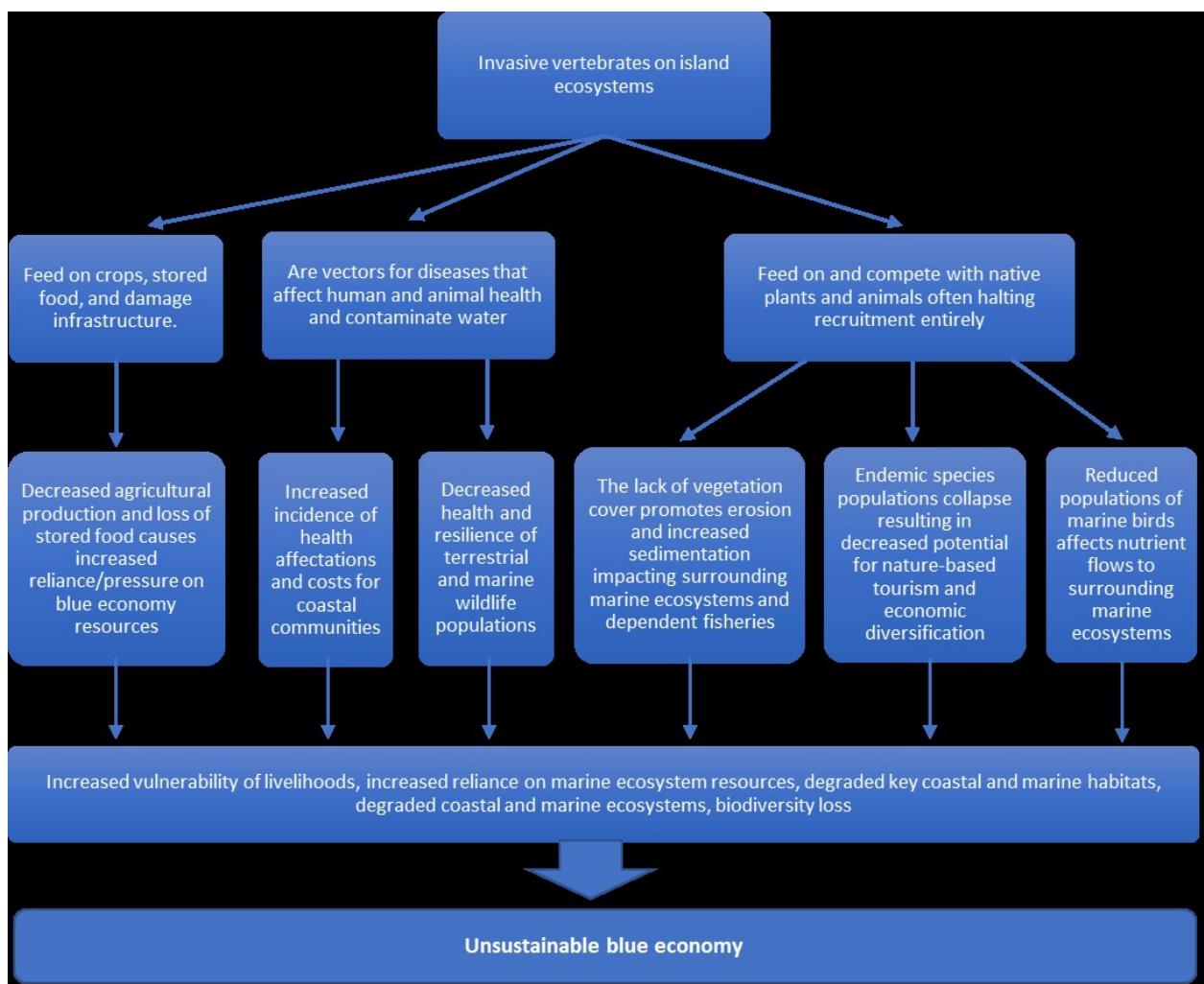


Figure 2: Diagram shows the link between invasive vertebrate species in the Galapagos and how they impact the sustainability of livelihoods and biodiversity.

One of the key long-term barriers to invasive species eradication in the Galapagos is the relatively high cost of such actions. Despite significant progress made in addressing this key area of financial sustainability, including through GEF support (see baseline discussion below), available financial resources continue to be insufficient to cover the broad range of critical needs facing Galapagos biodiversity due to the threats from IAS.

With respect to financial barriers, the eradication on Floreana and its eventual replication will require a greater investment than can be sourced from the FEIG endowment fund, highlighting the continuing need for a larger scale, sustainable financing source or sink fund for IAS eradications.^[57] Similar considerations apply in the case of the substantial budgetary outlays required to control, and conduct surveillance of, IUU fishing. Additional financing solutions are thus urgently needed.

2) The baseline scenario and any associated baseline projects

Baseline discussions of invasive species eradication and IUU fishing surveillance and control are presented below.

Invasive terrestrial species eradication

The GEF has provided significant past support for invasive species eradication in the Galapagos, including the following:

- ? Under GEF-3, Project ECU/00/G31 was implemented for goat eradication, establishment of a biosecurity system and creation of a Galapagos IAS fund. The latter, known as the ?Fund for the Control of Invasive Species in Galapagos (FEIG) ?was established in 2011 and is currently capitalized at approximately \$20 million. Since its creation, the fund has disbursed less than \$1 million per year on average. Funds are applied to a suite of needs related to invasive species prevention and control, including emergency response actions, biosecurity needs, education and awareness, and preparations for new eradication. While the FEIG has had an important impact and has contributed greatly to increasing available financing, it has unfortunately not been sufficient to eliminate financing as a barrier to invasive species eradication.

Under GEF-6, Project 9282 was approved and is currently operational. The project provides, *inter alia*, for the finalization of an eradication plan for invasive cats and rats on Floreana Island (see below). More generally, it establishes both the technical parameters and the social license necessary for the eradication to take place. By the time of its completion in the second half of 2021, the project will have generated important momentum for the eradication within the Floreana Island community. Among other achievements, Project 9282 has leveraged the majority of investment funding needed to allow the eradication to take place. In multiple respects, therefore, the proposed project would represent a seamless transition from its predecessor and would enable the full benefits of its pre-investment work to be realized.

Since 1960, the DPNG and partners have attempted 52 invasive vertebrate population eradications in the Galapagos Islands. Of these 52 attempts, 43 (83%) were successful, and 9 (17%) failed due to insufficient funding to implement the work at the scale necessary to achieve complete eradication.

As technical information, eradication tools (e.g., rodent baits), and funds have increased over the years, so has the frequency and success rate of invasive vertebrate eradication. With the exception of three successful eradication projects on satellite islands that were followed by reinvasions (black rats on Bartolome and Sombrero Chino Islands, 2011; black and Norway rats on Seymour Norte in 2017), results from all of the invasive vertebrate eradication projects over the last decade have been sustained. Since the completion of rodent eradication on Pinzon and Plaza Sur Islands in 2012, and Seymour Norte in 2019, invasive mammals had been eradicated from all feasible uninhabited Galapagos islands. All 11 eradication attempts of invasive mammals attempted on islands in the Galapagos larger than 150 ha in the last 12 years have been successful, and no subsequent reinvasions have occurred. The feral goat and pig eradication on Santiago Island were the largest attempted worldwide.

Despite these successes, additional invasive vertebrate eradication work is needed within the Galapagos archipelago. In 2012, the DPNG undertook an archipelago-wide analysis of the presence and impact of invasive alien species and subsequently released a report entitled, ?Control and Eradication of Priority Invasive Species to Reduce the Vulnerability of Endemic and Native Species of the Galapagos Islands.? Invasive rodents and feral cats were considered among the top priorities for invasive vertebrate eradication due to: 1) their prevalence on multiple islands in the archipelago, 2) devastating impacts to biodiversity and human livelihoods, 3) proven capacity for island-wide eradication, and 4) their being the only invasive mammals remaining on the island with the smallest human population, i.e. Floreana Island.

Most species of large invasive mammals have already been removed from Floreana Island. Feral pigs (*Sus scrofa*) were eradicated in the 1980s and feral cattle (*Bos taurus*) in 2007. Feral goats (*Capra hircus*) and donkeys (*Equus asinus*) were eradicated from the island in 2008. Remaining invasive vertebrates include: black rats (*Rattus rattus*), house mice (*Mus musculus*), feral cats (*Felis catus*), smooth-billed ani (*Crotophaga ani*), and an introduced gecko (*Phyllodactylus reissii*). At this time, livestock, poultry, and dogs are being well-maintained by the local residents.

The invasive alien vertebrates currently inhabiting Floreana Island are distributed across the whole of the island. Invasive rodents and feral cats tend to have higher concentrations in areas of human activity. However, island-wide densities of the invasive vertebrates vary by species, season, and year.

Responding to the GoE's urgent need to protect the biodiversity and people of Floreana Island, Island Conservation (IC) undertook a study in 2012 in order to assess the feasibility of eradicating invasive rodents and feral cats from Floreana Island. The results of this feasibility study, published by Island Conservation (IC) in 2013[58]⁵⁸, indicated that the eradication of invasive rodents and feral cats is feasible from a technical perspective. Based on the report, the overall priorities identified by the DPNG were as follows:

- ? Eradicate black rats, house mice and feral cats island-wide;
- ? Once eradication is complete, repatriate at least five endemic species to Floreana Island from satellite islands and secure their populations;
- ? Facilitate habitat recovery to the benefit of all threatened species, as necessary;
- ? Establish a community-based early detection/rapid response (EDRR) program on Floreana Island to facilitate detection and eradication of new introductions; and
- ? Apply lessons learned from the Floreana Island eradication work to other human-inhabited islands in the archipelago.

With the support of a GEF-6 Project (ID - 9282), a significant amount of groundwork has been laid for eradicating rats and feral cats from Floreana Island. Key steps taken include:

- ? Biosecurity system strengthened for mainland ports that service Galapagos, points of arrival to the Galapagos and inter-island pathways
- ? Floreana Island biosecurity plan developed and being implemented
- ? Feasibility study for eradication of invasive rodents and feral cats
- ? Non-target species risk analysis
- ? Risk analysis for humans
- ? Bait consumption trials (Brodifacoum, PAPP) and lethality
- ? Bait availability tests in the environment and palatability
- ? Development and socialization of management plans with the community
- ? Project implementation plan
- ? Cargo and machinery logistics plan
- ? Study of social, economic and productive baseline
- ? Study for improving the waste management system
- ? Installation of 34 shipping containers for rodent-proof food storage on farms and at local businesses
- ? Construction of 15 chicken coops to handle poultry
- ? Construction of a model corral for livestock handling
- ? The construction of a model piggery for handling pigs (in progress)
- ? Construction of two banks of aviaries for temporary captive holding of finch species, especially the Floreana Island endemic Medium tree finch, during eradication processes.
- ? Project approved by the Galapagos Government Council (CGREG) for the remodelling of the cargo and passenger dock, which will facilitate unloading of the cargo and machinery for this project.

Failure to eradicate invasive rodents and feral cats from Floreana Island would:

- ? Enable the persisting invasive vertebrate species to continue to predate upon, compete with, and/or spread pathogens and parasites to the native species of Floreana Island, including 61 species identified on the IUCN Red List as threatened with extinction;
- ? Likely result in the continued decline in threatened species: 6/14 vertebrate species and 14/14 invertebrate species;
- ? Allow for further degradation of Floreana Island's 17,253 hectares of sensitive terrestrial habitat;
- ? Decrease the nutrient transfer from the marine environment to the terrestrial environment by seabirds, with adverse impacts on vegetation structure and composition;
- ? Prevent both terrestrial and marine ecosystems from being able to support the long-term viability of native species, and possibly human livelihoods;
- ? Substantially undermine investments already made in environmental conservation, ecotourism, and sustainable agriculture on Floreana Island;
- ? Reduce Floreana Island's ecological and socio-economic resistance to the adverse impacts of climate change and other major environmental disturbances;
- ? Cause the GoE to lose the opportunity for Floreana Island to serve as a catalyst for similar eradication work on other islands of the Galapagos archipelago, and;
- ? Mean that other governments would not benefit from data and well-tested protocols that could enable them to move forward with invasive vertebrate eradications on numerous other human-inhabited islands.

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Illegal, unreported and unregulated (IUU) fishing[59]⁵⁹

The Organic Law of the Special Regime of Galapagos (LOREG), which was the legal basis for establishment of the Galapagos Marine Reserve, included a series of measures designed to regulate exploitation of Galapagos fishery resources[60]⁶⁰ [61]⁶¹. Among the most important measures were the establishment of a co-management system, the prohibition of industrial fishing within the limits of the RMG, the establishment of a moratorium on the granting of new fishing licenses and the allocation of exclusive fishing rights to the artisanal fishermen of Galapagos through the creation of a limited entry program, locally designated as the fishing registry. Today, the Galapagos artisanal fishing fleet is made up of approximately 410 active fishermen and 151 active fishing vessels[62]⁶².

The RMG has a marine zoning system, created between 2000 and 2006 through a participatory process[63]⁶³, and consisting of three zones:

? Multiple use: areas where fishing, tourism, science, conservation, navigation and manoeuvring activities (patrolling, search and rescue) are allowed. This zone consists mainly of deep waters greater than 300 m.

? Limited use: areas where regulations are established in addition to human activities allowed in the multiple use zone, whose objective is to protect environments, resources or activities that are important and sensitive to disturbance. This zone includes the coastal waters surrounding each island, islet or promontory that protrudes from the water surface, and other shallow waters (<300 m) including seamounts.

? Port: area where human activities allowed in the multiple-use zone are modified, according to the needs of the local population, considering social and environmental aspects. This area corresponds to the waters near the populated ports of Galapagos.

In 2014, the DPNG officially began a participatory marine and terrestrial spatial planning process, with the support of NGOs, to improve the effectiveness of the management of protected areas in Galapagos. After six years, this participatory process is close to a reconfiguration of marine zoning, including the creation, expansion or redistribution of no-take zones to protect new key conservation areas and ensure the conservation of at least 30% of all environmental units (e.g. corals, mangroves, etc.) of the Galapagos.

Control and surveillance program

The general objective of the Control and Surveillance program developed by DPNG^[64]⁶⁴ is to contribute to the conservation and rational use of the services generated by the ecosystems of the protected areas of Galapagos, promoting compliance with current regulations.

The greatest threats facing the DPNG's control and surveillance program in the marine environment include the illegal fishing of industrial vessels in the vicinity of the RMG, the use of fishing gear not allowed within the reserve, and the capture of species whose seasons are closed and/or are in no-fishing zones^[65]⁶⁵.

To counter these threats, the DPNG has a fleet for control and surveillance operations, which is made up of 12 vessels, a floating base, a land base, five land vehicles, a light aircraft and three monitoring centers. Most of the personnel, equipment and infrastructure for the control and surveillance of the RMG is located on Santa Cruz Island, which is the island with the largest population and influx of tourists, as well as in San Cristóbal, where more than 50% of the Galapagos artisanal fishing fleet is located.

Control and surveillance activities are planned on a monthly basis, through a Patrol Plan, and include control of the ports through the use of inflatable boats, control of sites near the port by coastal vessels, control of remote sites by larger ships and control along the limits of the reserve by means of a Sea Wolf type aircraft. In addition, night controls are carried out at docks, main access roads and other key

locations, using control points, road blockades and land vehicles. For each patrol activity, field reports are generated using forms stored in an Excel database.

DPNG control and surveillance activities are carried out in collaboration with the Ecuadorian Navy and the Environmental Police. To strengthen inter-institutional coordination, the DPNG has established agreements with the Regional Directorate of Aquatic Spaces and Island Coast Guard and the Environmental Protection Unit of the National Police.

DPNG control and surveillance operations are carried out by a Control and Surveillance Center. This unit in charge of managing data provided by the VMS and AIS devices, from which the activity of vessels navigating within the limits of the Galapagos Marine Reserve is monitored.

The functions of the Control and Surveillance Center are as follows:[66]⁶⁶

- ? Coordinate on a daily basis the marine, air, and land control and patrol activities to be carried out in the protected areas of Galapagos;
- ? Maintain updated status of the land, marine and air operational units, as well as of the remote units;
- ? Permanently monitor (through the monitoring center), the movement of vessels identified by the VMS and AIS tracking devices;
- ? Establish and update the operating and management procedures manuals for the control and surveillance support components;
- ? Manage coordinated control and surveillance actions with the Ecuadorian Navy in the marine area and with the National Police in the land area, through the use of an Operations Plan, complemented by inter-institutional cooperation agreements;
- ? Permanently report the operational status of the monitoring systems;
- ? Maintain permanent operation of the radio communication system, satellite telephones and others;
- ? Prepare a plan for the optimization and constant improvement of technological, equipment and human capacities, in order to make control and surveillance actions more effective and efficient, and;
- ? Maintain an updated record of the activities and information generated by the monitoring systems.

Thanks to the Control and Surveillance Center, national and international vessel traffic in the areas surrounding the RMG is monitored. In addition, activities of the artisanal and tourist fishing fleet that legally operate within the reserve are monitored, including cargo vessels that arrive every week at the Galapagos? three ports to supply food, fuel and other supplies to the local population. These data are used to help detect any unauthorized entry of vessels into the reserve, as well as to optimize control activities carried out by the DPNG?s fleet of vessels and aircraft. In addition, the control center contributes to port control through surveillance cameras.

Minor infractions are handled by the DPNG through an administrative process, while more serious cases are prosecuted by the State Judiciary and Attorney General's Office, with the support of DPNG lawyers.

To evaluate the effectiveness of the Control and Surveillance Program, the DPNG performs monthly monitoring of the following indicators: effective days of control, inspections carried out, operations carried out, area monitored.[\[67\]](#)⁶⁷

Finally, in order to promote compliance with fisheries regulations at the local level, the Control and Surveillance Program disseminates, via television, radio and social networks, information on fisheries management measures, such as closed seasons, minimum sizes, capture and other regulations. These activities are carried out in collaboration with the Environmental Communication, Participation, Education and Interpretation program.

The electronic monitoring system operates through a combination of a satellite-based vessel monitoring system (VMS), and an AIS system that works through radio frequency. The systems are complementary since AIS has limited coverage within 40 miles of the RMG, but provides real-time positions. With the AIS, Park managers can see all the vessels (national and international). International standards oblige ships to have AIS, which is built into ship radars. Only the park and the navy can see the positions of the national fleet on VMS. Smaller vessels are required to have AIS, while larger ones have VMS. AIS monitoring is free, while VMS requires an annual subscription. The national park and partners have purchased and installed antennae at key points on the islands and AIS devices for boats, and have established a set of regulations governing the use of both AIS and VMS systems.

During the last two years, the DPNG has implemented several actions to strengthen control and surveillance of the RMG, in collaboration with partners, including:

- ? Development of the RMG Marine Protection System (MPS).[\[68\]](#)⁶⁸
- ? Fleet re-engineering strategy for maritime control and surveillance operations, the objective of which is the renewal of the DPNG vessels.
- ? Optimization of control and surveillance activities, through the analysis of VMS and AIS data from the Control and Surveillance Center. The objective is to understand the behavior of the fishing and artisanal fleets that operate legally and illegally in and around the RMG in order to improve the effectiveness of control and surveillance actions, and to reduce the operating costs of the DPNG fleet.
- ? Preparation of an investment project to obtain financing to strengthen the control and surveillance of the RMG, with emphasis on the renewal of the fleet for maritime control and surveillance operations.
- ? The Park now has a monitoring hub through which it can see AIS and VMS in the same screen. A special program was created for that using Themis Web, which sees AIS and VMS on the same screen and in real time within and outside 40 miles. The Park has an agreement with the Ecuadorian navy to see the positions.

? Ecuador has joined Global Fishing Watch, through which data on vessel movements is shared, significantly adding to the level of transparency and availability of information in this area.

Failure, or significant delays, in implementation of the control and surveillance program, would open the door to unsustainable and destructive fishing practices affecting many of the 110 globally threatened marine species that have been recorded in the RMG. The seriousness of this threat is heightened by the presence of so many large industrial fishing vessels on the RMG outskirts.[69]⁶⁹ Potential impacts from just a few such vessels could be significant, thus underlining the importance of effective systems for control and surveillance.

3) The proposed alternative scenario with a description of outcomes and components of the project

Both the terrestrial and marine areas of the Galapagos protected areas support an astonishing abundance and variety of globally significant biodiversity. Despite long-standing and persistent efforts to conserve this biodiversity, significant challenges remain. Some 151 IUCN-threatened marine and terrestrial species have been recorded in the Galapagos?including 31 critically endangered, 26 endangered and 94 vulnerable species. A diverse suite of threats to these and other biodiversity has been identified within the Galapagos protected area management plan[70]⁷⁰ and the archipelago?s Marine Protection System Plan. Identified threats include: illicit activities such as illegal, unreported and unregulated (IUU) fishing; invasive species prevention, control and management; and a lack of capacity and financial resources. These threats and barriers have broad ranging impacts and implications, both on biodiversity as well as on sustainable livelihoods for island residents.

A broad suite of solutions has been identified that is capable of addressing the above threats and associated barriers. These include implementation of a ground-breaking strategy for eradicating invasive species on a significantly populated island, which builds on a significant GEF-6 effort. It includes use of advanced technologies to help optimize control of IUU for marine conservation. Finally, the proposed intervention recognizes and seeks to address the persistent problem of securing financial resources adequate to the important tasks still at hand. Together, these themes form a triad of ecologically interconnected[71]⁷¹ and mutually supporting elements of the present project. Together, they have the potential to make a serious contribution to the long-terms sustainability of this critically important protected area.

Outcomes and outputs will be delivered through a combination of GEF support and co-financing. Activities/items identified for GEF financial support have been chosen based on:

- ? National priorities for public finances and international non-reimbursable cooperation[72]⁷²;
- ? Priority needs to mitigate the impacts of invasive alien species and IUU fishing on globally significant biodiversity in the Galapagos Islands;
- ? Their ability to prevent the extinction of IUCN Critically Endangered species and facilitate ecosystem recovery; and
- ? The likelihood that these activities can serve as catalysts for the next phase of work in the Galapagos, as well as similar initiatives in other island systems and MPAs worldwide.

Component 1: Targeted eradication of invasive vertebrate species

The eradication of introduced vertebrates has become a widely accepted strategy for restoring island ecosystems. In a formal assessment, eradication of black rats, house mice and cats from Floreana Island, Galápagos was considered feasible using current techniques[73]⁷³. These same techniques have been used to safely remove rodents and feral cats from islands worldwide, including recent eradication projects within the Galápagos archipelago. An operational plan to safely remove black rats, house mice and cats from Floreana was developed and was approved by the project steering committee under the GEF-6 project 9282. As noted above, the proposed project will represent a seamless transition from its predecessor and will enable the full benefits of its pre-investment work to be realized.

The operational plan follows international best practice for IAS eradication, including processes for the humane treatment and disposal of species that will be eradicated. The strategy, methods, timeline, and necessary stakeholder involvement are summarized below.

The ultimate goal of work being done under this component is to restore ecosystem function and enhance community well-being on Floreana Island. This would be achieved through ecosystem recovery post-eradication of black rats, house mice and cats, by reducing impacts to crops and households, and by implementing effective biosecurity measures (e.g. preventing reintroductions of rodents and cats, and sterilization of all domestic cats so they cannot act as a source population). The effort is based on a partnership between the Galápagos National Park Directorate (DPNG), Galápagos Biosecurity Agency (ABG), the Ecuadorian Ministry of Environment, Junta Parroquial Isla Santa María (FPC), San Cristóbal Municipal government, Durrell Wildlife Conservation Trust, and Island Conservation and contributes to the overarching goal of developing a sustainable life on Floreana: ?Floreana Sostenible?.

Methods for this multi-species eradication take into consideration that Floreana is a dry-tropical island with a higher associated risk of failure than temperate islands^[74]⁷⁴. The combination of methods will include aerial and ground dispersed toxic rodent and cat baits (resulting in primary and secondary poisoning of target species), trapping, and hunting with and without dogs. Detection tools, including remote cameras, will be used before, during and post implementation to assist in confirmation.

To complement these actions, domestic cats will be sterilized and registered, euthanized or removed from the island. Regulations?currently in the process of being adopted?will be implemented prior to the eradication to ensure that these actions can be applied to all domestic cats on the island, and that no cats can be imported to the island after the operation.

Agreements are already in place to manage domestic livestock, crops, and allow access to all buildings and areas of the island, regardless of tenure. Regulations to ensure these actions can occur have been developed, along with guidelines related to inter-island biosecurity, enhanced ongoing biosecurity on the island, as well as legislation that regulates or prohibits importation of certain animals.

The eradication plan has been developed together with plans related to protecting non-target species during the campaign. Background information and context is provided within the Floreana Island rodent and cat eradication feasibility study^[75]⁷⁵.

Supplemental planning documents developed in conjunction with the eradication plan include:

- ? Operational safety plan
- ? Risk management plans covering pets, livestock, water, near-shore fisheries, children, tourism, and crops
- ? Project communications plan
- ? Biosecurity plan
- ? Non-target mitigation plan.

Outcome 1: Invasive rodents (*Rattus rattus* and *Mus musculus*) and feral cats (*Felis catus*) are eradicated from Floreana Island, enabling the recovery and protection of 61 IUCN Red List threatened species, as well as vulnerable ecosystems, on a 17,253-ha island

Indicator 1: Detection probability of feral cats and rodents

Component Target: Eradication of invasive rodents and feral cats is confirmed using a detection probability model, confirming that 100% of target populations have been removed

The methodologies used to eradicate invasive rats, mice and feral cats will closely adhere to, and most likely surpass, global 'best practices' for invasive vertebrate eradication in an island context^[76]⁷⁶. The specific protocols employed in this project will be based on methodologies and lessons learnt from the

executing agency's successful track record with invasive vertebrate eradication in the Galapagos archipelago, as well as international advances, lessons learnt and information shared by colleagues working in other island systems worldwide. (See the Project Safeguards Screening Form for specific information on eradication methodologies). An Environmental and Social Impact Assessment (ESIA) developed during the GEF-6 project (9282) will provide the analyses and management strategies necessary to minimize, avoid and mitigate pesticide risks to non-target species, including wildlife, livestock, pets, and people. These risks have been effectively managed in other invasive rodent and cat eradication projects (e.g. Pinzon^[77]⁷⁷, Rabida and Baltra islands, Galapagos; Rangitoto/Motutapu, New Zealand^[78]⁷⁸; Macquarie Island, Australia; Wake and Anacapa Islands, USA^[79]⁷⁹; Ascension Island, UK^[80]⁸⁰; Lord Howe Island, Australia^[81]⁸¹).

Incrementally achieved outputs, as well as associated targets and indicators, are described below.

Output 1.1: All infrastructure in place and preparations completed, ensuring readiness for a safe and effective eradication process

Indicator 1.1: Extent of completion of field preparations described in operational plan

Target 1.1: 100% of required preparations completed

As discussed in the baseline description above, the social readiness needed prior to the eradication process will have been completed by **the second half of** April 2021, with the support of the above-mentioned GEF-6 project. Cattle yards and piggeries for the remaining farms will be completed by the end of 2021. The next step in this staged-approach are the eradication implementation field preparations.

Supplying the population of Floreana Island requires a loading dock that allows efficient and safe handling. The handling of rodenticide, machinery, equipment and logistics in general, during the project would also benefit from the development of said infrastructure. Additionally, in the future, biosecurity and the implementation of preventive barriers to the entry of introduced species will benefit from improvements in the cargo handling infrastructure. It has been assisted with steps that have allowed the competent authorities to decide to invest in the improvement of port facilities, which will facilitate and guarantee a safer landing manoeuvre for equipment and supplies needed by the project.

In addition to the improved loading dock, the trail network across the island will be expanded and improved, allowing access across the island for deploying and revising detection devices like camera traps, and for hunters and trappers to readily access sites where feral cats have been detected.

Utilizing the dock, shipping containers with rodenticide bait will be positioned on-island, along with machinery for unloading containers, in the months prior to the implementation.

Output 1.2: Operational plan for invasive rodent and feral cat eradication is fully implemented

Indicator 1.2: Extent of operational plan implementation

Target 1.2: 100% of required actions implemented

The application of rodenticide in cereal baits will be done by means of drones and manually in certain areas such as populated areas, natural water sources, artificial sources and surroundings of natural lagoons. The bait will be applied during the dry season when rainfall is unlikely, i.e. between October and December, since during this season natural food is less available and rodent reproduction is scarce. In the planning phase, tests were carried out to ensure that the bait used will meet the necessary requirements to be effective, considering the particularities of the Floreana Island environment and the quantities that must be spread in each area have been calculated. Up to three rounds of bait application will be needed. Aerial application of feral cat bait will take place between 7 and 25 days after the last application of rodent bait. Drone flights will be recorded by high-precision GPS and will be mapped using geo-referenced information systems, allowing monitoring to identify areas that may need to receive additional bait. Detecting and removing the remaining cats will occur by monitoring with the use of remote camera traps, combined with spot-baiting, trapping and hunting.

All activities during the eradication operation will be recorded, including GPS location data for trap placement, date of cat capture, age and sex of animal, details of cat sign (e.g. type and age of sign, time of day), GPS location and photograph of cat sign, unintended mortality in traps, and verified sprung-no-capture events (trap escapes). Small, rugged hand-held field computers with GPS capabilities (e.g. Archer PDA Juniper Systems, Logan, UT) will be used in the field to record all relevant data via drop-down menus. This system allows for standardized data collection and when utilized with GIS allows for near real-time data analyses^[82]⁸². Managers will use these data to monitor ongoing progress of the eradication operation, and to assist with critical adaptive management decisions^[83]⁸³.

Building on key preparatory actions that have been or will be undertaken by the GEF-6 project^[84]⁸⁴, the following specific key steps in implementing the rodent eradication strategy will be supported:

- ? Implement Individual Property Management Agreements including all relevant management actions
 - ? Conduct audits to assess community adherence to protocols
 - ? Capture and hold in captivity non-target species deemed to be at unacceptable risk, as described in mitigation plans
-

- ? Implement aerial baiting with cereal bait and activate bait stations (rodent traps will be activated after the first aerial application)
- ? Assess bait availability and bait persistence after each bait application

Also building on the above baseline, the following key steps in implementing the feral cat eradication strategy will be supported:

- ? Placement of motion sensor infra-red (IR) trail cameras to provide baseline of cat abundance and activity (place inactive trap sites for later use if necessary)
- ? Survey island, select trap sites, document latrine sites
- ? Capture and sterilize 30 cats in total. Collar 20 cats to establish home-range data and utilize as an efficacy monitoring tool. Hold 10 cats in captivity
- ? Link data into Detection Probability Analysis
- ? Implement aerial baiting applications of cereal baits for rodent eradication
- ? Implement aerial baiting of sausage baits for cat eradication

Output 1.3: Monitoring and information systems are developed and used to confirm target species eradication

Indicator 1.3: Results of rodent and cat eradication detection surveys

Target 1.3: Rodent and feral cat eradication confirmed

The monitoring phase will begin immediately following completion of the application of the bait for rodents and cats. Rodent and feral cat eradication will be confirmed through information generated from monitoring efforts, the results of which will be used to feed mathematical models of probability of detection, thereby enabling eradication to be declared.

On Floreana, field surveys to detect rodent presence will be conducted after all aerial applications have occurred and repeatedly at regular intervals (e.g. 6, 12, 18 and 24 months) until models^[85] achieve ?95% confidence that eradication has been successful. Once this occurs, the eradication of mice and rats can be declared a success.

A range of tools will be utilized to detect rodents including rodent detection dogs, traps (live traps and snap-traps), chew-tabs, ?rodent hotels?, and remote trail cameras. Detection tools will be deployed across the island with a particular focus on higher-risk areas including kitchens, food storage facilities, the dump, productive agricultural areas, non-target species enclosures, and the dock.

Field surveys will begin two weeks after the third aerial bait broadcast and continue for two months. Detection dog/s will assess high-risk sites weekly. Rodent stations with bait and traps previously installed for the eradication will remain in place and will continue to be serviced weekly throughout this period. Rodent hotels, chew tabs, and remote trail cameras will be installed in accordance with the

biosecurity plan and will be monitored weekly over the field survey period. After the initial field surveys are complete, efforts will transition into long-term biosecurity in accordance with the Floreana Biosecurity plan.

If a rodent is collected after baiting operations have ceased, it will initiate an assessment by the partnership to determine the source of the sample. DNA analysis against archived samples will seek to determine if the individual survived eradication or if biosecurity was breached. Additional analysis may identify the source leading to a breach. In the event that biosecurity is breached, the biosecurity plan will be re-evaluated and amended to prevent future incursions.

Detection methods for feral cats will primarily include trail cameras (including use of olfactory or audio lures to attract cats) and searching for cat sign (e.g. scat, paw prints). Supplementary search effort will rely on traps, and detection dogs. Once animals are no longer detected on the island, the operation will move into the confirmation monitoring phase.

For feral cats, a probability of detection model using data collected during the eradication operation will estimate the number of animals that may persist, as well as predicting the amount of continued surveillance and where it is required to declare the eradication complete^[86]⁸⁶. For the detection probability model, managers will utilize a ?95% level of certainty (i.e. confidence) that if a cat existed, it would have been detected. After no further animals can be detected, all animals believed removed, and a ?95% level of certainty from the detection probability model, then the cat eradication will be declared a success.

Outcome 2: Implementation of the Marine Protection System Plan (MPS) has begun, protecting critical marine ecosystems within the Galapagos Marine Reserve (RMG) from the threat of illegal fishing

Indicator 2: Rate of interception of detected non-compliant vessels entering unauthorized into the RMG

Component Target: Twenty-five percent of detected non-compliant vessels entering unauthorized into the RMG are intercepted by DPNG authorities

In January 2021, the DPNG approved a Marine Protection System Plan (MPS)^[87]⁸⁷ designed to support the goals of the Galapagos Protected Areas Management Plan.^[88]⁸⁸ The MPS was designed based on a series of diagnostic exercises, including an evaluation of the existing fleet and an analysis of data related to the current system of surveillance. It identifies 20 priority actions designed to strengthen control and surveillance of the RMG. These actions build on the significant achievement made to date in establishing a working control center, including a VMS and AIS system?an accomplishment shared by no other marine reserve in the eastern tropical Pacific?by improving the detection of non-collaborative vessels and by strengthening capacities to respond to, and intercept, vessels that enter and/or fish within the RMG illegally.

Raising IUU surveillance and control capacities to the next level will involve several steps, the first of which is to strengthen DPNG's capacity for detection and response to offending vessels, in particular the so-called ?dark fleet? which is not being visualized with any system since they are turning off their AIS and VMS. Alternatively, some vessels leave their AIS and VMS on, while they deploy smaller boats that are not required to have this technology into the marine reserve, thereby avoiding detection. This dark fleet needs to be controlled through patrolling in the right areas. Park managers have data based on past positions of fishing boats, and are aware of trends and locations of fishing effort at different times of the year, which are based largely on patterns of marine life congregations. For example, near Isabela Island in the southwestern portion of the archipelago, illegal vessels are known to fish for both tuna and sharks, the latter including threatened species.

Under Component 2, GEF support, in partnership with the DPNG and a cofinancing consortium funded by Blue Action Fund that is led by Island Conservation and including Wild Aid, will enable implementation of four key strategic actions of the MPS aimed at maximizing benefits to marine biodiversity. These actions will contribute to reduced fishing pressure?both direct and incidental?facing multiple threatened marine species in the inshore and offshore waters of the RMG, including many of the 110 globally threatened species listed in **Annex H**. They include:

- ? Implementing a fleet renewal plan
- ? Implementing basic training courses and adopting standard operating protocols
- ? Enhancing data management equipment and systems
- ? Training DPNG lawyers and park rangers.

Additional output-level details are provided below.

Output 2.1: Improved equipment to implement control and surveillance

Indicator 2.1: Number of MPS recommendations that have started implementation

Target 2.1: Two MPS recommendations are being implemented (# 8 and # 10)

DPNG efforts to gather intelligence about the extent of illegal fishing operations around the RMG will be supported. This work will use data from the following sources: Visible Infrared Imaging Radiometer Suite (VIIRS), Automatic Identification System (AIS), Vessel Monitoring System (VMS) and Synthetic Aperture Radar (SAR). Together with co-financing from the Blue Action Fund (BAF) and BAF consortium partners, the project will provide computer hardware, software system upgrades, Sat-AIS capacity among other surveillance equipment (e.g. radars with AIS visualization capability for patrol vessel) to the DPNG to maintain and strengthen the capacity of their electronic monitoring system, as well as to improve the detection efficacy of patrol vessels. In addition, BAF consortium funding will purchase equipment to upgrade the control center by providing server upgrades and technical support of the Themis platform (VMS-AIS). GEF will complement this support by funding additional monitors and improved climate control equipment to protect the system and extend its usable life.

Park authorities maintain a floating base, known as ?Tiburon Martillo?, which moves among various hotspots according to the behavior patterns of fishing vessels. Cofinancing from the BAF consortium

will enable the park to acquire a fast interceptor boat which will be based at, and deployed from, the floating Tiburon Martillo base. This interceptor boat is scheduled to arrive in the second half of 2021. GEF support will allow the DPNG to complement and refurbish the basic equipment needed to enhance its capacity for interceptions. This will include refurbishing patrol boats and acquiring new motors for patrolling. In addition, GEF will provide for the purchase of two light vehicles (pickup trucks) for help with land-based operations and logistics related to control of illegal fishing.

In addition to controlling illegal offshore fishing, the above improvements will enable enhanced management and control of coastal fisheries, particularly with respect to inshore fisheries for sea cucumbers and sharks^[89]⁸⁹.

Output 2.2: Skills of the park rangers and DPNG legal department strengthened in control and surveillance techniques of the RMG

Indicator 2.2.a: Number of MPS recommendations that have started implementation

Target 2.2.a: 2 MPS recommendations are being implemented (# 14 and # 5)

Indicator 2.2.b: Number and gender composition of staff trained

Target 2.2.b: 30 staff, including 100% of female staff working in the area of control and surveillance
(Note: Female staff will also receive leadership training)

Capacity building taking place under this output will serve to complement the equipment-based support provided under the previous output, enabling the DPNG further to increase its interceptions and thereby serve as a more effective deterrent to IUU fishing.

Recently, the DPNG and the Navy jointly approved a revised "Operational Manual". This manual specifies the procedures to be followed related to control and surveillance on the high seas; for example, how to approach intercepted vessels, what to do in case irregular gear or other evidence of unpermitted fishing is found. However, ensuring effective implementation of this manual will require: 1) creation of a Pocket Manual to provide park rangers with a quick reference guide to facilitate operations on the high seas; 2) training of park rangers in the application of the procedures contained in the manual and in the use of the pocket guide as an operational tool.

Under this output, the project will develop and deliver a training program that captures best practices and serves as a basis for strengthening the capacity of the DPNG to improve overall law enforcement. Of the eight areas of training needs identified in the MPS, GEF resources will support training in the following topics:

- 1) Detection, Interdiction and Boarding: Training will be provided to rangers in how to deal with difficult situations, e.g. when intercepting and boarding vessels suspected of committing an infraction.
- 2) Update park staff on new laws and regulations, especially zoning laws and regulations that were recently revised as well as training in the application of administrative and judicial processes and sanctions

- 3) Reporting formats and procedures, as these reports are often the basis of sanction processes and often lack the required information,
- 4) Outboard motor maintenance. These trainings will be completed by bringing national and/or international experts to deliver effective training.

GEF-funded training will be complemented by training financed through a counterpart within the BAF consortium, the latter covering topics such as: procedural requirements related to recent legal reforms, maritime surveillance operations, and investigation mechanisms in wildlife trafficking. At least 30 DPNG staff members will be comprehensively trained.

Women are underrepresented in park ranger staff. Though the project cannot directly change hiring practices, it can provide gender sensitive leadership training for female park rangers, especially for those involved in control and surveillance within the GNPD. At least 30 GNPD staff will be trained and 3 to 5 women rangers will receive additional leadership training.

Component #3: Sustainability, knowledge, monitoring and evaluation

Outcome 3: Sustainability and knowledge are enhanced through development of a financial risk reduction mechanism, capture of lessons learned and monitoring and evaluation

Indicator 3: Process for establishing a financial risk reduction and a financial sustainability mechanism

Component target: Roadmaps outlining an approach to reducing financial risk and issuing green bonds; private sector and donor partnerships identified

A lack of sustainable sources of environmental finance has proven a significant and persistent barrier to conservation and ecosystem rehabilitation efforts in the Galapagos Islands. Invasive species eradication and control of IUU are among the most critical financial needs facing Park authorities, but they are far from the only ones. A constant need to identify adequate funding sources is both a distraction from implementation as well as a source in some cases of significant delays in delivering solutions.

In light of the above, the present project will move forward with assessment of the viability of two innovative forms of environmental finance.

Output 3.1: Roadmaps for an insurance mechanism designed to reduce financial risks associated with reinvasion by alien invasive species and for issuance of Galapagos biodiversity green bonds

Indicator 3.1: Number of roadmaps

Target 3.1: Two roadmaps approved by PSC

The up-front investment required to finance the removal of invasive species is significant. The results, while considered highly likely to be positive, nevertheless carry a small risk of failure. In addition, even successful eradication may be subject to reversals, in cases where inadequate attention is paid to

prevention of IAS introductions. In the case of Floreana Island and other Galapagos Islands cleared of invasive mammals, the possibility of reinvasion following successful eradications cannot be discounted entirely.

While carefully implementing biosecurity protocols may do much to minimize the above risks, it may not be capable of eliminating them entirely. Remaining risks can serve to dissuade otherwise eager investors of such actions. In such cases, and anytime an additional measure of financial security is needed in order to remove barriers to such investments, a form of insurance may be useful.

Under the present output, and with technical support from UNEP Financial Initiative^[90]⁹⁰, the project will develop two roadmaps to support the establishment of financial sustainability mechanisms. The first of these will constitute a complete strategy and framework for issuing green bonds^[91]⁹¹ for Galapagos biodiversity. These bonds could potentially be issued either by the Government of Ecuador or by a multi-lateral development bank such as CAF. They would be developed in line with the emerging European Union Sustainable Finance Taxonomy.^[92]⁹² The green bond approach would in principle be equally applicable to efforts to conserve both terrestrial biodiversity (e.g. invasive species eradication) and marine biodiversity (e.g. IUU prevention efforts) within PNG.

A second roadmap will outline steps for creating an insurance mechanism to reduce financial risk associated with IAS eradication investments. The approach will build on a global initiative aimed at engaging insurance companies in underwriting SDGs, including pilot studies related to ecosystems and biodiversity such as investments in coral reef restoration. Among the companies that have been most active in this area to date are Swiss Re, Allianz and Axa. These and other potential partners will be engaged via the ?Sustainability Leadership in Insurance? virtual meeting series. Based in part on the results of this outreach, the roadmap will be developed. It will analyze, among others, the following issues: i) legal viability, ii) financial viability, iii) institutional viability, and iv) whether the national regulatory framework would allow DPNG or another entity to pay for insurance premiums to national or international insurance companies. The end goal to which this will contribute would ideally see an insurance mechanism that would pay for the costs of eradication if reinvasion or invasion occurred.

Output 3.2: Effective management of knowledge, based on learning and dissemination of project lessons and innovations

The project will make every effort to capture lessons learned from implementation. These will include lessons related to the use of camera traps, the limitations of the detection probability model, the nature of the cost benefit curve relating increased detection effort to reduced IUU, etc. To this end, the project will carefully document its approach and methodology and ensure that its results are effectively communicated / shared amongst experts, policy makers and the general public in Ecuador and beyond.

Indicator 3.2: Specific technical lessons captured and disseminated for application in subsequent eradications

Target 3.1: Three concrete lessons learned and available for replication

The project team will make a concerted effort to learn and document the lessons emerging from project implementation. As noted above, the project design includes a mixture of well-proven techniques, suggesting minimal risks of failure, and innovative aspects, suggesting that significant learning will indeed take place. Dissemination and replication within and beyond the Galapagos will represent the impact pathway along which lesson learning will proceed.

Output 3.3: Project monitored and evaluated

Indicator 3.3: Evaluation reports

Target 3.3: One final evaluation report

Under this output, monitoring of safeguards and risk management will be ensured, and a final project evaluation will be conducted.

4) Alignment with GEF focal area and/or impact program strategies;

The project will closely coordinate and share lessons with other GEF-7 biodiversity projects focused on prevention, control and management of alien invasive species, many of which are focused on islands. In addition, it will liaise closely with GEF-6 projects:

- GEF project 9410. Strengthening national and regional capacities to reduce the impact of Invasive Alien Species on globally significant biodiversity in the Pacific.
- GEF project 9282. Safeguarding biodiversity in the Galapagos Islands by enhancing biosecurity and creating the enabling environment for the restoration of Galapagos Island ecosystems.

The project will also coordinate closely with the Blue Action Fund project for Ecuador and Costa Rica titled ?Strengthening conservation in Galapagos and Cocos Protected Areas by expanding the protected area, implementing improved management strategies, and supporting local economies.?

5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing

Summary Baseline Analysis (without the GEF's Intervention)

Under the baseline scenario without the GEF intervention, there is a strong probability that, despite the substantial preparation work that has laid the foundation for eradication, there would be ongoing delays in implementing the required actions on Floreana Island. As long as such delays persist under the baseline, invasive mammals would continue to inflict the following negative impacts on the biodiversity of the island and its inshore marine ecosystems:

- ? Enable the persisting invasive vertebrate species to continue to predate upon, compete with, and/or spread pathogens and parasites to the native species of Floreana Island, including 61 species identified on the IUCN Red List as threatened with extinction;
- ? Likely result in the continued decline in threatened species: 6/14 vertebrate species and 14/14 invertebrate species;
- ? Allow for further degradation of Floreana Island's 17,253 hectares of sensitive terrestrial habitat;
- ? Decrease the nutrient transfer from the marine environment to the terrestrial environment by seabirds, thereby having an adverse impact on vegetation structure and composition;
- ? Prevent both terrestrial and marine ecosystems from being able to support the long-term viability of native species, and possibly human livelihoods;
- ? Substantially undermine investments already made in environmental conservation, ecotourism, and sustainable agriculture on Floreana Island;
- ? Reduce Floreana Island's ecological and socio-economic resistance to the adverse impacts of climate change and other major environmental disturbances; and
- ? The GoE would lose the opportunity for Floreana Island to serve as a catalyst for similar eradication work on other islands of the Galapagos archipelago. Other governments will not benefit from data and well-tested protocols that would enable them to move forward with invasive vertebrate eradications on human-inhabited islands worldwide.

Without GEF incremental support to the control and surveillance of IUU fishing, progress would continue to be made in enhancing DPNG capacities in this area. However, in the face of continued shortcomings in equipment and capacities, the DPNG would not be able to fully implement its ambitious but necessary control and surveillance plan. Importantly, efforts would tend somewhat to focus on commercially significant fisheries as opposed to deliberate targeting and by-catch of various globally threatened species, notably including sharks, with multiple ramifications up and down the food chain. Given the scale at which large commercial fishing vessels in particular can operate and the rapidity with which they can decimate vulnerable populations, catastrophic impacts on certain species could not be ruled out.

The GEF Alternative

By eradicating invasive rodents and feral cats from the 17,253 ha of Floreana Island, the project will convey direct and immediate benefits to the island's native flora and fauna across terrestrial, freshwater, and marine ecosystems. Of particular importance is the opportunity to recover populations of 61 endemic plant and animal species that are currently threatened with extinction. Once the invasive predators are removed, populations of at least six IUCN Red List threatened endemic species and seven other species can be repatriated to Floreana Island and their populations secured. These include: the Floreana giant tortoise (*Chelonoidis elephantopus*), Floreana mockingbird (*Mimus trifasciatus*), Galapagos rail (*Laterallus spilonotus*), Lava gull (*Larus fuliginosus*), and Galapagos hawk (*Buteo galapagoensis*). Outcomes of the eradication activities will be carefully evaluated and protocols made available for use on human-inhabited islands in the Galapagos archipelago and beyond.

Improved MPA regulation enforcement in the RMG will better protect near-shore and pelagic populations, including multiple threatened species. With reduced fishing pressure, pelagic fish biomass is expected to increase. This will benefit pelagic species through increased food resources and reduced likelihood they will be caught by fishers. Critically endangered (CR) species^[93]⁹³ present in the RMG and expected to benefit from reduced IUU fishing include: scalloped hammerhead shark, great hammerhead shark, oceanic white-tip shark, leatherback turtle, hawksbill turtle, waved albatross, and Galapagos petrel. Critically endangered scalloped hammerhead sharks are currently in decline and these actions combined with others below should halt their decline and over time allow populations to recover. Endangered (EN) species^[94]⁹⁴ within the RMG include: whale shark, basking shark, longfin mako, shortfin mako, pelagic thresher, spinetail devil ray, bluefin devil ray, sicklefin devil ray, Galapagos sea lion, Galapagos fur seal, blue whale, sei whale, Galapagos penguin, and green sea turtle. In summary, at least 110 IUCN threatened (CR 19, EN 19, VU 72) species are within the RMG.

In addition to IUCN threatened species, populations of other ?key species? include those with significant populations and biomass which drive ecosystems and are important fisheries species. Biomass and density increases of these species within the RMG are expected over time. Examples include yellowfin tuna, skipjack tuna, dolphin fish, wahoo, swordfish and other species that are harvested or discarded bycatch of industrial and IUU fishers.

Cost Effectiveness Analysis of Chosen Alternative

The project's cost effectiveness is best understood with reference to its individual components, as follows:

? The cost effectiveness of Component 1 rests primarily on three factors: (1) the high global significance of Galapagos? biodiversity (see above) and associated total economic value; (2) the actual and ongoing impact of IAS on these global values, on Floreana and other islands, including high

risks of species extinction, and; (3) the balancing of expenses incurred in order to conduct and verify eradications vs. the risk (see above) of failing in this central task. This trade off, for example, is reflected in the project's 95% certainty requirement, which is considered to be the most cost-effective level of certainty in this case.

? Component 2 supports implementation of a series of actions that have been carefully weighed against a variety of possible alternatives considered in the formulation of the MPS Plan. Cost effectiveness was particularly important here, given the high cost of capital investment in vessels, aerial surveillance equipment and operational costs. In this case, enhanced data and information enables cost-effective equipment procurement and response strategies. With GEF support, increasing emphasis will be placed on targeting of IUU affecting globally significant species.

? Component 3 focuses on knowledge, insurance and financial sustainability, each of which contribute to the project's overall cost effectiveness by: (1) reducing the financial risks associated with possible future reinvasion, (2) enabling future cost-effective investments in biodiversity conservation, and (iii) expanding the application of project results to further actions, both in Galapagos and elsewhere around the world.

6) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)

Floreana Island has been identified as one of the top five islands globally where eradicating invasive mammals will prevent extinctions of threatened wildlife^[95]. This is based on a global assessment of islands and extinction risk of threatened vertebrates, irreplaceability, severity of impact from invasive species, technical feasibility of eradication, and socio-political feasibility.

Freshwater is a very limited resource on Floreana Island, and the Galapagos Islands in general. Floreana Island's 140 human residents, livestock, and wildlife are largely dependent on the health of just two freshwater springs. Eradicating invasive rodents will help protect these springs by increasing vegetation cover across the island. This will convert eroded soils back into a ?sponge,? causing the groundwater layers to rise rather than fall. Capture of sea-fog (locally known as ?garua?) will be enhanced, resulting in more substantial precipitation. Additionally, increasing vegetation cover will reduce the temperature of the air column above the island, causing water vapor to condense, and thereby increasing rainfall. The net effect will be a positive increase in freshwater availability.

Biodiversity conservation increases ecosystem resilience. Eradicating invasive rodents and feral cats on Floreana Island will promote recovery of native vegetation, which, in turn, will help maintain and re-establish the native fauna and secure the livelihoods of local peoples dependent on these habitats and their services. Habitat recovery will create the conditions necessary for the reintroduction of endemic species extirpated from the islands (see above). The more intact Floreana Island's ecosystems are, the greater their capacity to adapt to future environmental disturbance, including climate change.

The invasive alien rodents on Floreana Island deplete food supplies through the destruction of in-field crops, depredation of stored food and seed, and faecal contamination. The rodent impact is so substantial that entire fields of maize and cassava (locally called yuca) can be devastated even though rodent control measures are being actively applied. The eradication of invasive rats and mice will completely eliminate these crop losses.

Removal of feral cats and invasive rodents will eliminate primary vectors of diseases on Floreana Island, helping to safeguard the health of Floreana Island's wildlife, livestock, residents, and tourists. Invasive alien rodents are often attracted to human-built infrastructure. They feed, chew holes, urinate, defecate and nest in areas occupied by people. The presence of rodents in commensal areas can lead to an increased risk of disease, including lymphocytic chorio-meningitis, plague, leptospirosis, hantavirus, and salmonellosis. Once rodents are removed from commensal areas, the hygiene of a building and its contents can be better managed and human and animal health secured.

Feral cats also serve as reservoirs and critical hosts of parasites and disease and often live in the vicinity of human dwellings in order to take advantage of rodent populations and shelter. Cats carry several diseases in the Galapagos Islands that can infect both humans and wildlife. For example, cats are the critical host for *Toxoplasma gondii*, commonly known as the disease ?toxoplasmosis.? On Floreana Island, toxoplasmosis is a threat to human residents and visitors, as well as the endemic Galapagos sea lions (*Zalophus wollebaeki*), Galapagos penguins (*Spheniscus mendiculus*), and other wildlife. Symptoms of toxoplasmosis in native fauna include poor coordination, blindness, lethargy, respiratory and enteric distress, and sudden death. In infected people, similar symptoms are exhibited and may include spontaneous abortions[96]⁹⁶.

While Component 1 will generate direct terrestrial biodiversity benefits, while generating ancillary benefits for marine ecosystems and biodiversity, component 2 will focus directly on the latter. Improved MPA regulation enforcement in the RMG will better protect near-shore and pelagic populations, including threatened species. With reduced fishing pressure pelagic fish biomass is expected to increase. This will benefit pelagic species through increased food resources and reduced likelihood they will be caught by fishers. Critically endangered (CR) species[97]⁹⁷ present in the RMG and expected to benefit from reduced IUU fishing include: scalloped hammerhead shark, great hammerhead shark, oceanic white-tip shark, leatherback turtle, hawksbill turtle, waved albatross, and Galapagos petrel. Critically endangered scalloped hammerhead sharks are currently in decline and these actions combined with others below should halt their decline and over time allow populations to recover. Endangered (EN) species[98]⁹⁸ within the RMG include: whale shark, basking shark, longfin mako, shortfin mako, pelagic thresher, spinetail devil ray, bluefin devil ray, sicklefin devil ray, Galapagos sea lion, Galapagos fur seal, blue whale, sei whale, Galapagos penguin, and green sea turtle. In summary, at least 110 IUCN threatened (CR 19, EN 19, VU 72) species are within the RMG.

In addition to IUCN threatened species, populations of other ?key species? certainly include those with significant populations and biomass which drive ecosystems and are important fisheries species. Biomass and density increases of these species within the RMG are expected over time. Examples

include yellowfin tuna, skipjack tuna, dolphin fish, wahoo, swordfish and other species that are harvested or discarded bycatch of industrial and IUU fishers.

7) innovativeness, sustainability and potential for scaling up. ?

Innovativeness: The eradication of invasive rodents and feral cats from Floreana Island is being undertaken as a direct response to a request for assistance from the Floreana Parish Council (FPC) and supports implementation of a key milestone in the FPC's sustainable development plan for the island[1]. The 140 residents of Floreana Island recognize the urgent need to build environmental and social resilience in the face of climate change. Unlike most conservation projects which involve ?first world-based? organizations trying to convince ?developing countries? what their priorities should be and how they should be achieved, this project is explicitly being designed to meet the needs identified by local people who already understand the intimate linkages between biodiversity, livelihoods, and human survival. Technical activities to eradicate invasive alien species will be coupled with continued training in conflict transformation so that the local people are better prepared to engage with each other in community-based planning processes, as well as constructively interact with private sector (esp. tourist industry), tourists, the Ecuadorian government, and others whose activities on or near Floreana Island need to be consistent with the capacity of the island to support its inhabitants over the long-term.[2]

Significant technical opportunities in methods are being embraced under Component 1 to advance and mainstream innovations for increasing safety, specificity and feasibility, while decreasing the cost, of invasive vertebrate eradications. Drones were used on Seymour Norte to aerially broadcast rodent bait for rat eradication, a world first that provided proof-of-concept through a collaborative effort between DPNG, Island Conservation and Envico Technologies Limited. However, the drone platform used for this proof-of-concept had only a 20-kg lift capacity. That, along with its battery power source, limit the use of that drone platform to relatively small islands like Seymour Norte at 180 ha. Envico Technologies, in collaboration with Island Conservation and New Zealand's Department of Conservation, are trialling a drone for aerial baiting with over 200kg payload capacity. This drone type will be used for the aerial application of rodenticide bait on Floreana (Component 1; sub-grant to ECT), providing significant cost savings over traditionally used helicopters with an underslung bait spreader bucket. The use of this sized drone at the scale of Floreana will mainstream the use of this tool for invasive rodent eradication globally.

Detection probability tools have required costly project-specific contracts with specialists to be able to implement them (e.g. [3]). Island Conservation have been engaging with and providing data sets for a publicly accessible tool for eradication practitioners as part of a collaboration with the tool developers ? Australia's Center for Invasive Species Solutions, the Arthur Riley Institute and New Zealand's Landcare Research. The online tool will be used for confirming the eradication of feral cats from

Floreana Island. The confirmation of rodents will require an alternative tool, and we will continue working with developers of the Rapid eradication assessment[4] tool, designed for confirming absence of rodents on small islands. To make it useful for a larger island like Floreana rodent reproduction parameters and resulting change in ?footprint? of surviving populations over time will be required. The use of these tools on Floreana will help refine the tools themselves and consolidate the use of these tools by managers working with invasive species.

Sustainability: Given the increasing technical proficiency of targeted eradication methods, finance and financial risk are looking increasingly large relative to other challenges to sustainability. For this reason, the project includes an output to assess the feasibility of innovative financing mechanisms designed to provide long-term financing and insurance solutions for conducting eradications and other conservation actions. This would be an important step in reducing the need for external financial assistance for invasive species eradication.

Upscaling: Floreana Island has the potential to serve as a ?transformative opportunity? for invasive alien vertebrate eradication on human inhabited islands. Because the island and the human population are smaller than the other islands in the Galapagos archipelago and the biodiversity is already well-studied, Floreana Island offers the best opportunity for the DPNG and its partners to establish effective protocols for the eradication of invasive rodents and feral cats from inhabited islands.

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- [10] <http://www.keybiodiversityareas.org/>
- [11] <http://www.iucnredlist.org/>; Roque-Albelo 2007; Tye 2007
- [12] Ministry of Environment 2014; <https://www.cbd.int/doc/world/ec/ec-nr-05-es.pdf>
- [13] The World Bank estimates that tourism contributed \$1,449,000,000 to the country?s economy in 2016, the majority of which was generated in the Galapagos Islands;
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- [37] Bascompte, Meli?n & Sala, 2005; Myers et al., 2007; Heithaus, Wirsing & Dill, 2012.
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- [41] DPNG AIS/VMS control and surveillance data. Average of non-compliance data from 2017 to 2019
- [42] Armada del Ecuador in <https://lta.reuters.com/articulo/ecuador-ambiente-china-idLTAKCN2550RO-OUSLT>
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[84] As described in the baseline section above, by mid-2021 these will have included, inter alia: (i) Conducting bait application trials to inform the baiting strategy, (ii) implementing a public awareness program about the eradication project and community involvement, (iii) conducting detailed non-target risk assessments; (iv) developing mitigation plans for species facing unacceptable risks, (v) developing pre-eradication commensal rodent control guidelines, management plans, and Individual Property Management Agreements, and (vi) assessing ongoing biosecurity measures and collaborate with biosecurity agency to refine procedures as necessary.

[85] Models for confirming probability of absence of rats and mice on Floreana will build upon Kim et al. 2020, incorporating breeding parameters of invasive rodents over time. See Kim JH, Corson P, Mulgan N, et al. (2020) Rapid eradication assessment (REA): a tool for pest absence confirmation. *Wildlife Research* 47:128-136

[86] Ramsey, David & Parkes, John & Will, David & Hanson, Chad & Campbell, Karl. (2011). Quantifying the success of feral cat eradication, San Nicolas Island, California. *New Zealand Journal of Ecology*. 35(2): 163-172

[87] DPNG. 2021. Sistema de protección marina para la reserva marina de Galápagos.

[88] Among the actionable elements of the overall management plan being supported by the present project are: 1.3.1.2. Update and implement clear and simple procedures that allow smooth planning and operation of control actions; 1.3.3.2. Implement operating manuals that clearly determine the procedures of the members of the public force, other competent entities and Park Rangers when carrying out control actions; 1.3.3.3. Periodically train all personnel involved in control operations on current legal regulations

[89] See, e.g. <https://news.mongabay.com/2015/11/galapagos-gold-rush-feeds-global-hunger-for-shark-fins-sea-cucumbers/>

[90] See www.unepfi.org

[91] Green bonds are any type of bond instrument whose proceeds are exclusively applied to finance or re-finance eligible green projects and which are aligned with the four core components of the Green Bond Principles. These latter are related to: Use of proceeds, Process for evaluation and selection, Management of proceeds and Reporting. See Chahine, Paul and Ludwig Liagre. 2020. How can green bonds catalyse investments in biodiversity and sustainable land-use projects? Luxembourg Green Exchange and Global Landscapes Forum.

[92] The future adoption of the Taxonomy?with six environmental objectives, including one on protection and restoration of biodiversity and ecosystems?is expected to be a significant driver for financing of biodiversity and sustainable land use projects by investors and financial institutions. See Chahine and Liagre 2020.

[93] Map search using IUCN 2020. The IUCN Red List of Threatened Species. Version 2020-3.

[94] Map search using IUCN 2020. The IUCN Red List of Threatened Species. Version 2020-3.

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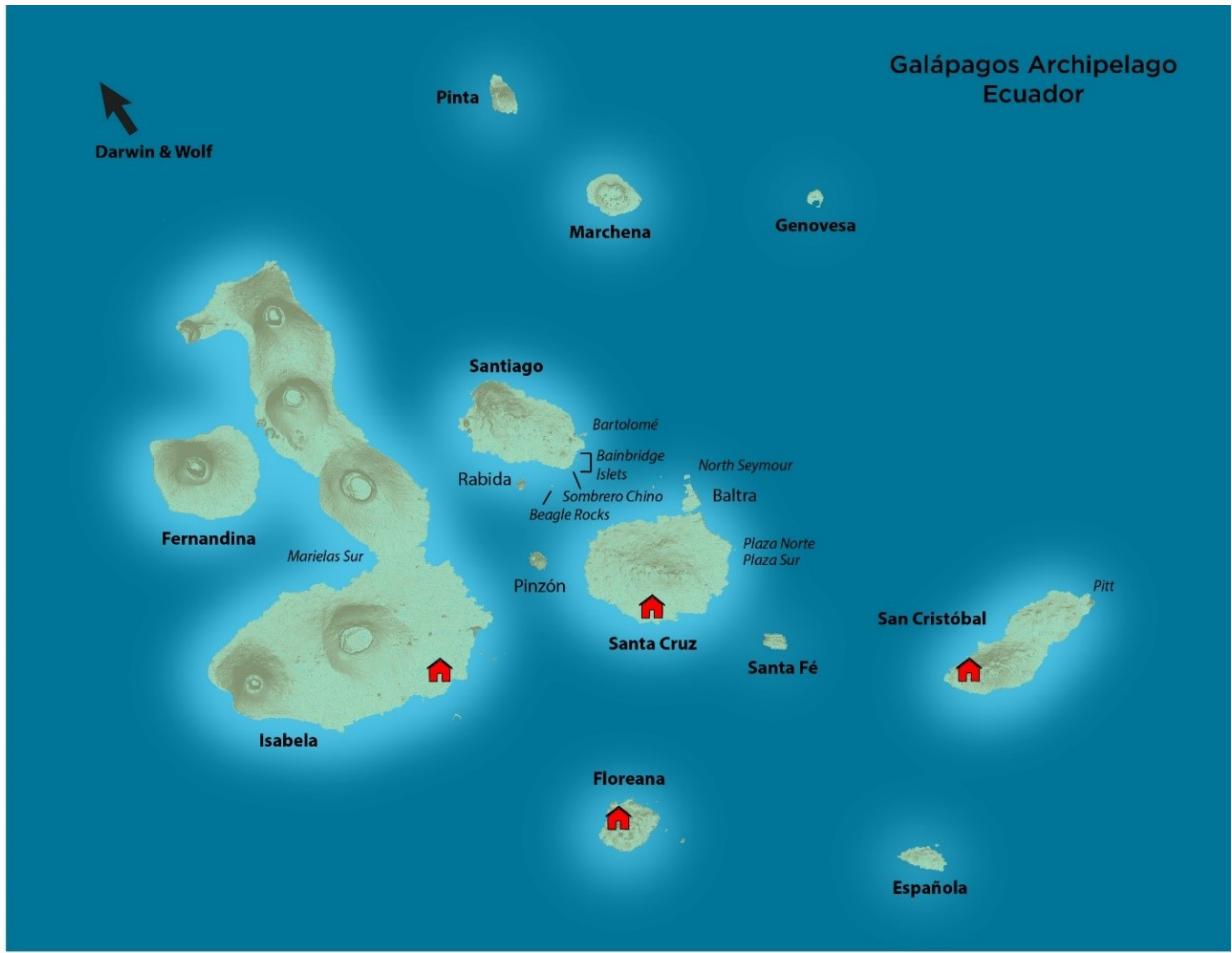
[97] Map search using IUCN 2020. The IUCN Red List of Threatened Species. Version 2020-3.

[98] Map search using IUCN 2020. The IUCN Red List of Threatened Species. Version 2020-3.

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

Coordinates 0°20'0"S 90°0'0"W



Galapagos Marine Reserve:

DMS 0° 3' 13" S, 90° 46' 9" W
Decimal -0.053611, -90.769167
Geo URI geo:-0.053611,-90.769167
UTM 15M 748299 9994070

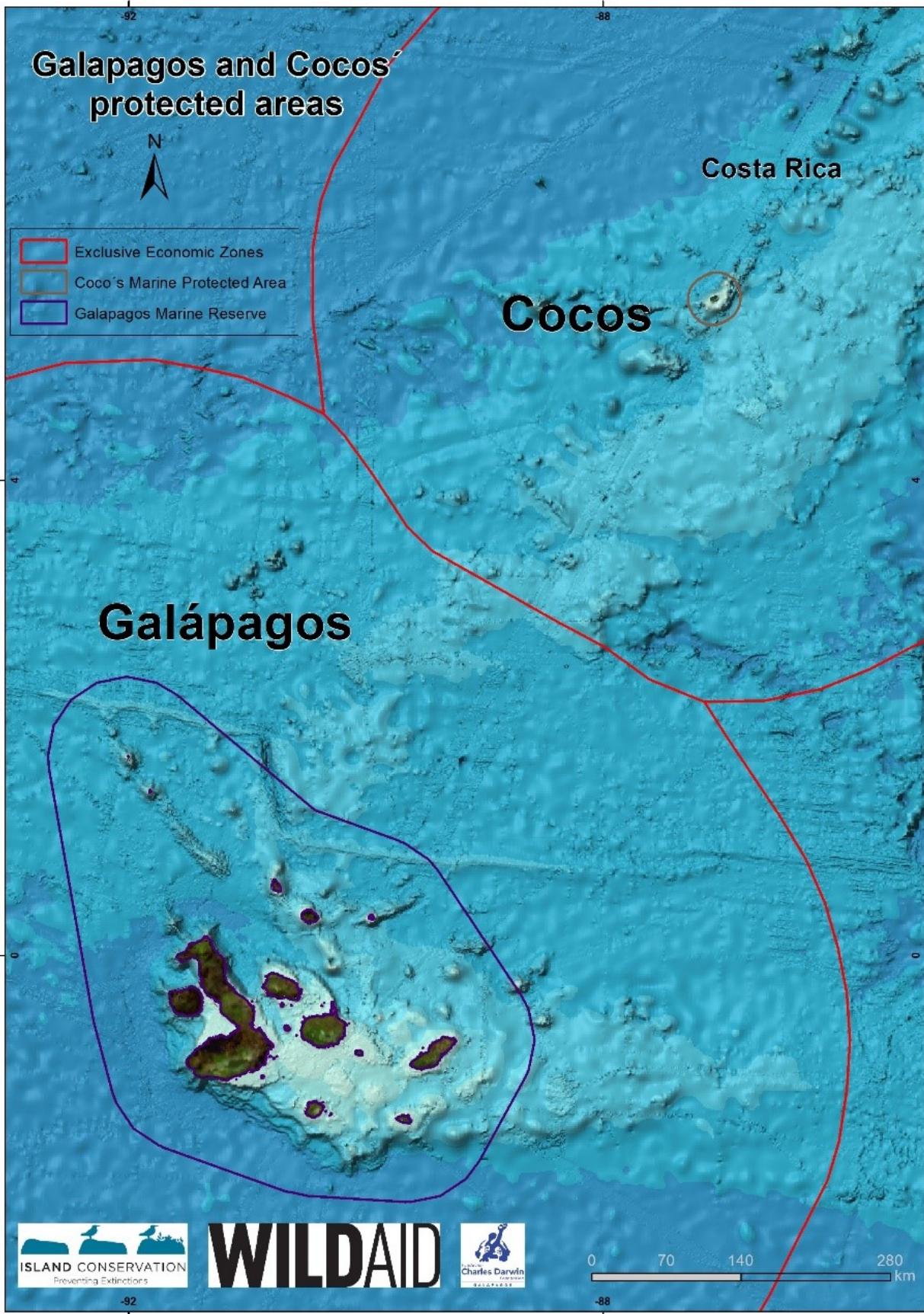
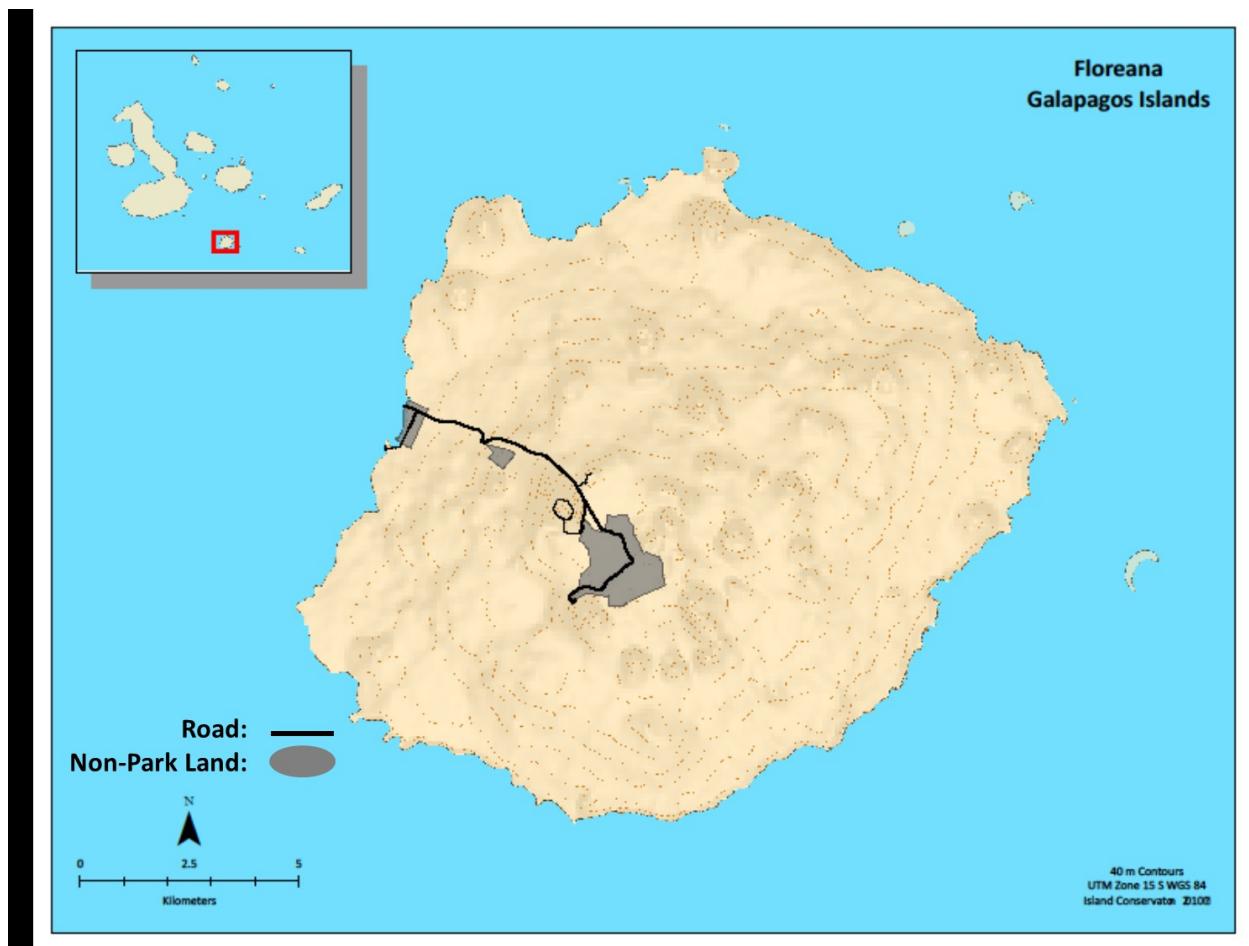


Figure 3: Map of Floreana Island



Floreana Island/Coordinates
1.3083° S, 90.4314° W

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

N/A

2. Stakeholders

Please provide the Stakeholder Engagement Plan or equivalent assessment.

Stakeholder Engagement Plan

Summary of Previous Stakeholder Engagement Activity

Island Conservation has been working closely with the community on Floreana Island since 2012. This has included consultations leading up to the GEF-6 project, as well as consultations undertaken as part

of that project's implementation. **Table 2** below provides information regarding relevant consultations undertaken over the past 18 months.

Table 2: Consultations with Floreana Island residents regarding planned eradications and related matters, July 2019 - present

Consultations related to development of the present project's marine component are outlined in **Table 3** below.

Table 3: Stakeholder consultations related to development of the project's marine biodiversity component (Component 2)

Date	Institution	Meeting with	Place	Type	objective
June 21, 2019	Parish Board of Floreana Municipality of San Cristóbal	All members of the Parish Board Mayor of San Cristóbal All Councillors of San Cristóbal	Floreana	diffusion	field visit to Floreana and explanation of the Project
August 27 - 30, 2019	Property owners	Visit terrain by terrain in the upper part of the island	Floreana	diffusion	inform about the project home by home
October 18, 2019	Representatives of all Floreana Institutions	JPF, DPNG, ABG, MSP, MdE, MAG, Capitanía Puerto	Floreana	Socialization	Socialize eight risk management plans with a social focus
November 19-20, 2019	Floreana Parish Board, DPNG, ABG, CGREG, Amazonas School	Representatives of each institution	Floreana	diffusion	Report on complaint mechanisms and placard placement
November 2019	Households and owners	10 households	Floreana	diffusion	Discussion of management plan and risk plans
November, 2019	Households and owners	3 owners	San Cristóbal	diffusion	Discussion of management plan and risk plans

Date	Institution	Meeting with	Place	Type	objective
December, 2019	Households and owners	10 households	Floreana	diffusion	Discussion of management plan and risk plans
December, 2019	Households and owners	3 owners	San Cristobal	diffusion	Discussion of management plan and risk plans
Decembre 19th, 2019	Amazon School	Teachers of the Amazonas School	Floreana	diffusion	Inform and coordinate activities
December 20th, 2019	Floreana Parish Board	Meeting with 8 owners of chicken coops to be built	Floreana	Construction planning	That each owner prepare the necessary documents that prove that they are the owner or tenant of a property in the Floreana Agricultural Zone
January 28 - February 3, 2020	Households and owners	10 households	Floreana	diffusion	Discussion of management plan and risk plans
February 7 to 8, 2020	6 Finqueeros		San Cristobal	Training	Training in livestock management
February 18 to 21, 2020	Households and owners	15 households	Floreana	diffusion	Discussion of management plan and risk plans
February 21st, 2020		We organized a consultation meeting on February 21st, with 22 members of the community representing all public institutions in Floreana in order to discuss the water management plan.	Floreana	Socialization	Water management plan

Date	Institution	Meeting with	Place	Type	objective
March 9, 2020	PNG	5 park rangers	Floreana	Training	Petrel Management
March 5th, 2020	Municipality	Mayor of San Cristobal	Floreana	Tracing	Project Activities
July 20, 2020	Property owner	House Mr. Jos? Ver?	Puerto Baquerizo Moreno	Socialization	Socialization, signing of the donation contract and use of the chicken coop in an agricultural area in Floreana
July 21, 2020	San Cristobal Municipality	Mayor, Councilors, Director of Tourism of the GAD. District Director of Education, PNG DEAPS Director	Puerto Baquerizo Moreno	Socialization	Present summary and progress of the PF, Socialize the water management plans and children
July 23, 2020	Property owner	Fishing Cooperative Office	Puerto Baquerizo Moreno	Socialization	Socialization of the PF and verification of the property in Floreana
11 of September, 2020	Property Owner (Empress Salgado)	follow-up phone call	Floreana	socialization	socialization and follow-up of commitments, coordination of signature of chicken coop donation, delivery of documents-
11 of September, 2020	Land tenant (Wilma Perez)	follow-up phone call	Floreana	Tracing	Socialization and monitoring of commitments.
September 14, 2020	Property owner (Roc?o Izquierdo)	follow-up phone call	Floreana	Tracing	Socialization and monitoring of commitments.

Date	Institution	Meeting with	Place	Type	objective
September 15, 2020	Property owner and tenants (Francisco moreno, Yadira, Segundo)	follow-up phone call	Floreana	socialization	Verification of commitments, state donation agreement, monitoring of commitments and Covid impacts
September 15, 2020	Property Owner (Cecilia Salgado)	follow-up phone call	Floreana	Tracing	Socialization and monitoring of commitments.
September 15, 2020	Land tenant (Wilma Perez)	follow-up phone call	Floreana	Tracing	Socialization and monitoring of commitments.
September, 17th, 2020	Owner of the property, (Wilma P?rez)	Coordination of infrastructure development for mitigation	Floreana	Coordination and monitoring	Coordinate site to build infrastructure and details of required documents
September 22, 2020	Property Owner (Max Freire)	follow-up phone call	Floreana	socialization	Verify chicken coop status and commitments and Covid impacts
September 22, 2020	Property owner and tenant (Jonson L?pez, Wilma Perez)	follow-up phone call	Floreana	socialization	Verification of commitments, state donation agreement, monitoring of commitments and Covid impacts
September 22, 2020	Property owner (Santiago)	follow-up phone call	Floreana	socialization	Verification of commitments, state donation agreement, monitoring of commitments and Covid impacts

Date	Institution	Meeting with	Place	Type	objective
24th September, 2020	Owner of Preedio (Giusseppe Maniscalco)	Face-to-face meeting.	Santa Cruz	Socialization	Socialization of the PF and verification of the property in Floreana
September 25th, 2020	Moreno family	follow-up phone call	Floreana	socialization	Verification of commitments, state donation agreement, monitoring of commitments and Covid impacts
October 2nd, 2020	Land tenant (Segundo Moreno)	Call by Zoom. Follow-up agreements for the use of infrastructure for mitigation.	Floreana	Monitoring and coordination	Discuss agreements for use of infrastructure.
October 7, 2020	Land tenant (Wilma Perez)	follow-up phone call	Floreana	socialization	Verification of commitments, state donation agreement, monitoring of commitments and Covid impacts
October 16, 2020	Property Owner and buyers (San Migue, Jazmani and Mayra)	follow-up phone call	Floreana	socialization	Socialization and monitoring of commitments.
October 20, 2020	School Director (Roc?o Izquierdo)	follow-up phone call	Floreana	Tracing	Socialization and monitoring of commitments.
October 21, 2020	Property Owner (Charles Wittmer)	follow-up phone call	Floreana	Tracing	Socialization and monitoring of commitments.
October 28 and 29, 2020	San Cristobal Municipality	Mayor, Councilors	Puerto Baquerizo Moreno	Socialization	Monitoring commitments, property review.

Date	Institution	Meeting with	Place	Type	objective
November 17, 2020	Floreana Parish Board	Board President	Floreana	Coordination	Coordination of meetings with Floreana producers
November 18th, 2020	Property owners	Visit farms	Floreana	Tracing	Follow-up on paperwork for legal procedures with construction beneficiaries
November 19th, 2020	MAG	Face-to-face meeting	Floreana	Coordination	Checking machinery, equipment and material needs for producers in Floreana
December 15, 2020	Green Floreana	Face-to-face meeting	Floreana	Socialization and Planning.	Socialization of non-target species mitigation actions and planning of the strengthening process of the VF Association
December 16, 2020	Pig producers	Face-to-face meeting.	floreana	Socialization	Socialization on constructions to mitigate the effects of rodent eradication and construction of shed
December 16, 2020	Christmas treat	Face-to-face meeting.	Floreana	Interaction with the community	Maintain a close relationship with the community
December 17, 2020	Floreana Island Parish Board	Face-to-face meeting.	Floreana	Coordination	EIA information, misc. coordination.

Date	Institution	Meeting with	Place	Type	objective
January 15-17, 2021	Property owners	visit to different properties	Floreana	Socialization and Planning.	individual meetings to communicate the start of the EIA and the presence of consultants in 2021 on the island. Approximately 48 families and representatives of public institutions.
January 20th 2021	Official approval (aka. social licence) for project	Formal document and meeting	Floreana	Socialization	Received official and formal approval from the Parish Council for the implementation of the eradication
Activity		Target Stakeholder	Description		Date
Meeting with Park officials in charge of control and surveillance to discuss project activities and set priorities.		Harry Reyes, Paola Buitron - GNPS Diana Vinueza - WildAid	Confirm support to project and discuss details required for the presentation of full proposal		25/06/2020
Asociaci?n de Armadores Pesqueros del Muelle de Pelican Bay (ASO. ARMAPEZBAY).		Deep Sea Fishers Group (Jaime Vicente Erazo, Celso Villaruel, Boris Novoa, Pedro Asencio) Mauricio Castrej?n Fisheries Expert Diana Vinueza ? Wild Aid	Discuss project objectives related to surveillance and patrol, current efforts and challenges that the fishers are facing. Interested in adding value to their fish products, potential technology and devices that can be used to reduce by catch and add value		22/07/2020

Activity	Target Stakeholder	Description	Date
Isabela Fishing cooperative	Oscar Intriago. Pescador Isabela Harry Reyes. DPNG Diana Vinueza WildAid	- They would be willing to respect the use of monitoring devices, including the VMS - They stated that technical advice is important in the commercialization processes, as well as in capture and post capture techniques	05/08/2020
COPROPAG Fishing Cooperative	COPROPAG Dionisio Zapata, Gerente; Alejandro Moya, abogado. Greg Unda. San Cristobal Rodolfo Villacis. Infopront-WildAid Diana Vinueza WildAid Mauricio Castrej?n Fisheries Expert	Discuss project objectives related to surveillance and patrol, current efforts and challenges that the fishers are facing, potential technology and devices that can be used to reduce by catch and add value	26/08/2020

Project Stakeholders Strategic actors in the project's implementation phase will include: the partner institutions that endorse and will participate in the execution of the project; the institutions that are contributing funding to implement each of the components of the project, and; the target group that constitutes the technical team in charge of co-executing the activities of each component. **Table 4** below links stakeholders to relevant project components.

Table 4: Stakeholder identification, by project component

Stakeholders	Component 1.	Component 2.	Component 3.
Government Agencies			
DPNG	X	X	X
MAAE	X	X	X
CGREG	X	X	X

ABG	X		
FIAS			X
Floreana Parish Council	X		
Multilateral Organization			
Development Bank of Latin America (CAF)	X	X	X
GEF	X	X	X
Blue Action Fund	X	X	
Non-Governmental Organizations (NGOs)			
Island Conservation (IC)	X	X	X
Environment and Conservation Technologies (ECT)	X		
WildAid		X	

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement.

Table 5 describes the expected role of the above institutions in project execution.

Table 5: Stakeholder roles, overall and with respect to project

Stakeholder	Institutional role	Expected role in project execution
Government Agencies		
DPNG	Management authority of Galapagos Protected Areas (part of MAE with decentralized authority)	DPNG will be responsible at the highest level for ensuring project execution and management, including monitoring and evaluation of project interventions, achieving project outcomes (both funded by GEF and through co-financing), and effective use of GEF resources.

MAAE	National Ministry with management authority over Environment (all protected areas) and Water	MAAE will be involved in the project management committee, as overall oversight of its national GEF portfolio activities.
CGREG	Galapagos Province level government	General high-level knowledge of project.
ABG	Galapagos agency in charge of biosecurity	Coordinates component 1 biosecurity related issues, mostly funded through cofinancing.
FIAS	Manages different National trust funds and other financial instruments for conservation	FIAS will be consulted regarding component 3 innovative funding mechanisms
Floreana Parish Council	Parish-level government structure overseeing basic infrastructure and services in Floreana	Parish council is the main representative of the people of Floreana. It has been, and will continue to be, closely consulted regarding project activities.
NON-GOVERNMENTAL ORGANIZATIONS (NGOs)		
Island Conservation (IC)	Prevents extinctions by removing invasive alien species from island ecosystems	IC will serve as the executing agency for the project. It will provide technical assistance to DPNG in project execution. http://www.islandconservation.org
Environment and Conservation Technologies (ECT)	Develop pioneering technology solutions for environmental sustainability	ECT will act as executing partner within Component 1. for the delivery of drone-related aspects. https://www.ectech.co.nz/
WildAid	End the illegal wildlife trade in our lifetimes by reducing demand for endangered wildlife products through public awareness campaigns and providing comprehensive marine protection	WildAid will act as executing partner within Component 2. for capacity building within the DPNG. https://wildaid.org/

Development Bank of Latin America (CAF)	GEF Implementing Agency	CAF will be the Implementing Agency for the project. It will participate and contribute to the development of the roadmaps for the insurance mechanism and Galapagos biodiversity green bonds.
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Select what role civil society will play in the project:

Consulted only; Yes

Member of Advisory Body; Contractor;

Co-financier;

Member of project steering committee or equivalent decision-making body;

Executor or co-executor;

Other (Please explain)

N/A

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

A gender analysis and mainstreaming plan is presented as Annex 11 of the CAF project document.

Women are disproportionately affected by invasive rodents on Floreana Island, as agricultural production is impacted 40-60% by rodents, and 70% of farms are women-led and are a primary source of income for women. This results in affect on women through loss of pregnancies from toxoplasmosis.

Consistent with the need to ensure gender mainstreaming throughout the project, the Results Framework has been modified to indicate the specific number of women and men directly benefitting from the project, which is also consistent with GEF-7 Core Indicator 11. Compliance with the required outputs and standards of the GEF gender policy will be subject to independent external auditing to be explicitly referenced in the Project Operations Manual, in all Subsidiary Agreements between CAF and the project's Executing Agencies, and in the Terms of Reference for the Terminal Evaluation of the project.

The project will strive to include men and women in stakeholder workshops. Professional facilitators who will lead stakeholder workshops will be experienced in using techniques to actively provide a voice to women.

It is expected that women will be underrepresented in training opportunities offered to park rangers, as most park rangers in the GMR are men. The project cannot change government hiring practices, but it will provide opportunities for women who participate to be heard and to feel safe and involved. The project will also offer additional leadership training for female park rangers engaged in control and surveillance trainings.

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?

Yes

Closing gender gaps in access to and control over natural resources;

Improving women's participation and decision making

Generating socio-economic benefits or services or women Yes

Will the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Elaborate on private sector engagement in the project, if any

On Floreana Island, the project will work with small businesses, including farmers, who will benefit from its eradication work. In the case of the marine component #2, engagement will be with fishing enterprises of various sizes and shapes, all of whom will benefit over the long term from more sustainable fisheries. To the extent that increased enforcement of regulations are employed as a tool for compliance, the project will ensure careful outreach and awareness raising on the part of affected private sector stakeholders.

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

Table 6 below presents project risks and associated mitigation measures designed to reduce them.

Table 6: Risks and Risk Mitigation Measures

Project Outcome	Risks	Rating	Risk Mitigation Measures
	Failure of the eradication process	Low	<p>Our confidence that the eradication of invasive rodents and feral cats can be fully achieved is based on: 1) previous success with the eradication of invasive vertebrates from islands; 2) a feasibility study, including field trials[1]; 3) on-the-ground progress in project preparation; and 4) the active engagement of the Floreana community and partners in a ?conflict transformation-based approach? to collaboration. The feasibility study for Floreana Island rodent and feral cat eradication found that the overall benefits of eradication outweighed the costs, and that risks can be effectively managed. Multiple stages of peer-review have occurred for the eradication implementation plan and other project documents to ensure efficacy and likelihood of project success is maximized.</p>
	Weak governmental coordination and management capacity	Medium	<p>The large scale of GEF projects can create substantial challenges for government agencies that lack the human capacity to manage them effectively. Poor coordination has been cited in numerous GEF mid-term and terminal reviews as a barrier to project success. The GoE has garnered substantial experience in GEF project management across multiple agencies and in cooperation with a large number of non-governmental partner institutions. Every effort has been made to incorporate the lessons learned from executing one project into the design and management frameworks for future projects. The GoE is prepared to dedicate the highly-qualified staff needed to ensure project success. A Project Steering Committee will provide a means for the government to effectively collaborate with other partners in the execution of the project proposed herein.</p>
	Failure to adequately educate and inspire key stakeholders	Medium	<p>The GoE agencies and institutional partners listed in this proposal are already well-informed and committed to conservation in the Galapagos archipelago. Several activities are planned within the scope of the projects providing co-financing to engage, educate, and inspire the local communities with whom on-the-ground GEF 7 project implementation is planned. In some cases, GEF7 project activities are being undertaken in response to requests for support from key stakeholders. For example, the FPC previously requested that IC help the community address invasive alien species on Floreana Island.</p>

	COVID-19 related risks	Medium	At the time of writing, 25% of the Galapagos Islands? population had already been vaccinated. The goal is to vaccinate 100% of Galapagos residents over 18 years of age by the end of May 2021, prior to expected project launch date (July 2021). Recovery of the tourist industry, which could increase transition risk, will depend on a wider array of factors. The project will employ a high degree of caution in ensuring that its activities do not increase the risk of transmission and spread. This will include, at a minimum, complying with all Government regulations regarding social distancing, vaccination requirements, quarantining, etc. Stakeholder consultations in particular will be subject to organizational and government regulations as a minimum.
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[1] Island Conservation 2013. Floreana Island Ecological Restoration: Rodent and Cat Eradication Feasibility Analysis v.6.1. (English and Spanish)

6. Institutional Arrangement and Coordination

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

Beneficiary

The DPNG, created in 1959 through Executive Decree N-17, is the project beneficiary. It is the administrator for the Galapagos National Park and Galapagos Marine Reserve, through a decentralized process within the organic structure of the Ministry of the Environment and Water (MAAE; as established by Ministerial Agreement 025 of March 15, 2012). The DPNG ensures the adequate management of these two areas, safeguards the rational use of their natural resources, promotes scientific research with conservation goals, and engages local communities in conservation activities. The Management Plan for the Galapagos Protected Areas guides the DPNG?s overarching goals and strategic activities[1].

GEF Implementing Agency

The GEF Implementing Agency will be the Latin American Development Bank (CAF). CAF will support project implementation by maintaining oversight of all technical and financial management aspects, which includes oversight of project execution to ensure that the project is being carried out in accordance with GEF standards and requirements. CAF will monitor the project?s implementation and achievement of project outputs, ensure proper use of GEF funds, review and approve procurement plans, budgets and work plans. CAF will approve quarterly technical and financial reports and the annual Project Implementation Reports (PIRs) prior to GEF submission. Finally, CAF will make recommendations to optimize project performance, and will arbitrate and ensure resolution of any conflicts related to project execution.

Executing Agency

The co-executing agencies will be Island Conservation (IC) and the DPNG. The project builds upon the long-term working collaboration between DPNG and IC. **Figure 5** presents the project execution organization chart.

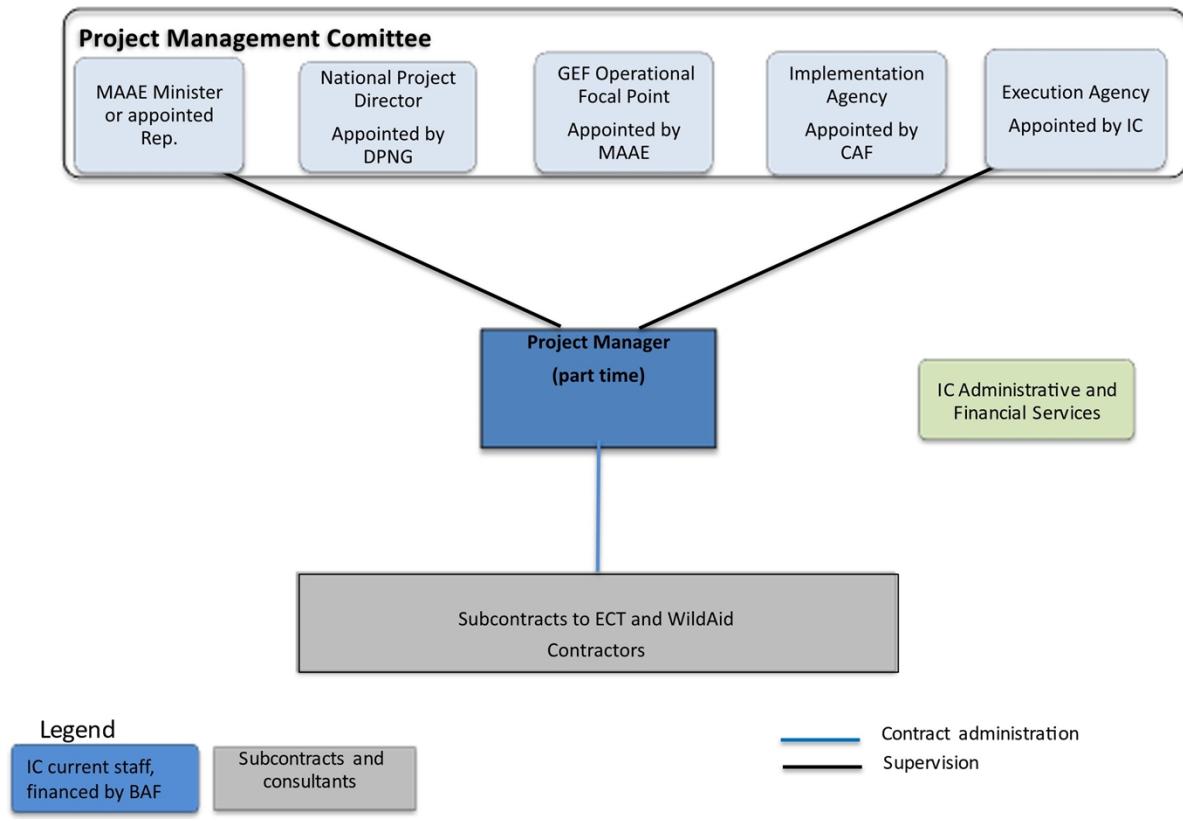


Figure 5: Project organization chart

The project will be implemented over a period of 60 months.

The DPNG will be responsible at the highest level for ensuring project execution and management, including the monitoring and evaluation of project interventions, achieving project outcomes (both funded by GEF and through co-financing), and the effective use of GEF resources.

MAAE, in coordination with DPNG, has requested that IC be responsible for executing technical, administrative and financial actions. For this purpose, DPNG will sign a letter of agreement with Island Conservation (IC) prior to project implementation.

As co-executing agency, IC will receive project-specific GEF funding from CAF as implementing agency, based on the approved project document and annual workplans/budgets. Thus, IC will undertake the execution of the project, which implies the ability to manage and administer the day-to-day activities. This includes responsibility for managing the timely delivery of project outcomes and outputs and for appropriate use of funds, for procurement and contracting of goods and services. CAF will supervise the proper use of funding and compliance with GEF rules and CAF procurement policy.

Environment and Conservation Technologies (ECT) will act as executing partner within Component 1. For this purpose, IC will sign a sub-grant with ECT for the delivery of drone-related aspects of Component 1. This sub-grant will reflect the terms of IC's contract provisions as an executing agency under contract to the CAF implementing agency.

Wild Aid will act as the executing partner within Component 2. For this purpose, IC will sign a grant with WildAid for the capacity-building of the DPNG in Component 2. This sub-grant will reflect IC's contractual terms and provisions as an executing agency under contract with the CAF implementing agency.

The project organization structure includes: a Project Management Committee (PMC); a National Project Director, and; a Project Manager. Each of these is described below.

Project Management Committee

The Project Management Committee (PMC) is responsible for making decisions regarding the project.

The PMC will:

- ? Provides general strategic orientation, ensures that the project is aligned with PRODOC and that the results and products planned in PRODOC are achieved;
- ? Ensures the efficient use of financial resources, according to what is planned in the Annual Operating Plan and the Annual Project Budget;
- ? Approves the Annual Project Execution Report (PIR), the Annual Operating Plan (AOP), Annual Budget, and the Annual Purchase Plan before being sent to CAF;
- ? Makes high-level decisions regarding project strategy, structure, coordination, and implementation;
- ? Evaluates project performance, including analyzing the project mid-term evaluation and ensuring its recommendations are implemented.

The PMC comprises the following members: Minister of Environment and Water, the National Project Director appointed by the DPNG, GEF Operational Focal Point appointed by MAAE, a representative from CAF as Implementing Agency, and a representative from IC as Executing Agency. The PMC will make decisions by consensus. In cases, where votes are required for a decision, and in order to ensure separation of the Implementation Agency's oversight function, the representative from CAF will have a voice, but not a vote. The PMC will have in-person or virtual meetings at least once per year. The National Project Director, through requests from its members, may convene additional committee meetings. The Project Manager will be PMC secretary, preparing meeting minutes, and maintaining the Committee's records; he/she will have a voice but not a vote.

National Project Director

The project will be under the overall leadership of a National Project Director (NPD), who will be appointed by the Director of the DPNG. The NPD's responsibilities will include:

- ? Ensure project alignment with government policy and priorities;
- ? Review the AOP, PIR and the Annual Procurement Plan before submitting it to the PMC;
- ? Ensure the technical, logistical, administrative and financial effectiveness of IC, as executing partner, in the fulfillment of its functions;
- ? Ensure coordination and support for project activities within the DPNG, including the preparation of co-financing reports as offered by government entities in PRODOC;
- ? Maintain regular communication and ensure support with the MAAE, as well as maintain fluid communication and collaboration with other institutions related to the execution of the project (for example, ABG, Ministry of Agriculture, Ministry of Health, Floreana Parish Council, Navy, among others);
- ? Seek the advice of strategic partners as needed;
- ? Provide technical guidance to the project team and the PMC on issues related to the project components;
- ? Monitor all project expenses and have the following tools to assist in this process:
 - a. provides technical authorization for the AOP, the Annual Procurement Plan and the quarterly reports, before sending them to CAF;
 - b. participates in the Selection Committee for all procurement processes over \$ 25,000.

Project Manager

The Project Manager's annual activity will be directed by the PMC and NPD through approvals of the AOP and the progress reports every three months. The Project Manager is a part-time position supervised by, and reports to, the NPD in coordination with the IC Program Director.

IC staff who deliver products will report to the Project Manager regarding delivery of project outputs. IC core staff, financial and administrative staff will provide support to the Project Manager.

The Project Manager will lead the day-to-day operation of the project. This will include (i) preparation of project reports, work plans, budgets and accounting records, (ii) maintaining smooth communication and coordination with project partners and key stakeholders, (iii) acting as secretary of the PMC, and (iv) preparing co-financing reports. The Project Manager function will end when the project completion report, and other documentation required by the GEF has been completed and submitted to CAF (including operational closure of the project).

The Project Manager will oversee project activity implementation and will oversee work tasks produced by IC staff related to the project. Project Manager will lead implementation of the monitoring and evaluation plan.

[1]

http://www.galapagos.gob.ec/wpcontent/uploads/downloads/2016/07/DPNG_Plan_de_Manejo_2014.pdf

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

The project will contribute to several higher level national and international objectives and commitments of the Government of Ecuador. These include:

- ? Convention on Biological Diversity: 2020 Aichi Targets: 9?invasive alien species control or eradication, 12?preventing threatened species extinctions)
- ? United Nations Sustainable Development Goals: Targets 15.5?halt the loss of biodiversity, and 15.8?prevent and reduce the impact of invasive species on land and water ecosystems
- ? Ecuador?s National Development Plan (2017-2021): Objective 3 ? Guarantee the rights of nature for current and future generations
- ? Ecuador?s National Biodiversity Strategy and Action Plan (NBSAP) (2015-2030): Ecuador?s NBSAP aims to deliver 19 results, of which the project will contribute most directly to the following: (i) Result 8 - Ecuador ensures sustainable use of marine, coastal and freshwater resources at industrial, artisanal and subsistence levels, to assure biodiversity conservation; (ii) Result 11a - Ecuador has implemented a plan to eradicate invasive alien species from Galapagos and a monitoring system provides data to ensure a process of restoration of affected ecological systems.
- ? Galapagos Islands Provincial Plan for the Management of Invasive Species (2019-2029): This plan calls for a series of actions to prevent, control and manage invasive species. The eradication work planned under Component 1 of the Project would make a major contribution.
- ? Galapagos Protected Areas Management Plan: The plan includes actions related to invasive species prevention, management and control (see also previous bullet) to which the project will contribute. It also identifies a series of targets relate to control of IUU that will be supported, including: (i)Update and implement clear and simple procedures that allow smooth planning and operation of control actions; (ii) Implement operational manuals that clearly determine the procedures of the members of the public force, other competent entities and Park Rangers when carrying out control actions; (iii) Periodically train all personnel involved in control operations on current legal regulations.
- ? Galapagos Marine Protection System (MSP): The project will contribute directly to the following objectives: (i) # 5 Implement basic training courses and adopt standard operating protocols (GEF funds); (ii) # 8 Repower the THEMIS system servers and carry out technology optimization studies (BAF Funds); (iii) # 10 Implement the fleet renewal plan, including the installation of radars with integrated AIS in the Sierra Negra, Molme and each coastal boat; (iv) # 14 Train DPNG lawyers on new matters and also CUSOS Park Rangers in the preparation of a good report
- ? Floreana Island Parish Council sustainable development plan, which explicitly calls for eradication of invasive rodents and feral cats from the island[1].

[1] FPC 2015. Plan Integral para el Desarrollo Sostenible de la Isla Floreana, Galapagos

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

Knowledge management is a central element of Component 3 of the project. Outcome 3 will enhance knowledge in three ways:

? Support for the development of a financial risk mechanism will include preparation of a detailed plan / roadmap for establishing two such mechanisms. The resulting knowledge will be critical for enabling policy makers to understand exactly how such innovative mechanisms can be adapted and used in the Galapagos context, thus enabling their adaptation, uptake and, potentially, further replication.

? Support for the capture of lessons learned will focus on those lessons emerging from implementation work under components 1 and 2. As noted above, the Floreana work includes innovative aspects due to the fact that the island is populated, while component 2 will address monitoring and enforcement issues that are distinctive in the local context. Lessons are expected related to the use of camera traps, the limitations of the detection probability model, the nature of the cost benefit curve relating increased detection effort to reduced IUU, etc. The project will carefully document its approach and methodology and ensure that its results are effectively communicated / shared amongst experts, policy makers and the general public in Ecuador and beyond.

? The project will be carefully monitored and evaluated, with resulting lessons made available.

Component 3 of the project has a GEF budget of approximately \$90,000.

9. Monitoring and Evaluation

Describe the budgeted M and E plan

Project results, corresponding indicators and end-of-project targets in the project's results framework will be monitored annually and evaluated periodically during project implementation. The Monitoring Plan included in below details the roles, responsibilities, and frequency of monitoring project results.

Project-level monitoring and evaluation will be undertaken in compliance with CAF requirements. Additional mandatory GEF-specific M&E requirements will be undertaken in accordance with the [GEF Monitoring Policy](#) and the [GEF Evaluation Policy](#) and other [relevant GEF policies](#)[1]. The Monitoring plan will guide the GEF-specific M&E activities to be undertaken by this project.

In addition to these mandatory CAF and GEF M&E requirements, other M&E activities deemed necessary to support project-level adaptive management will be agreed during the Project Inception Workshop and will be detailed in the Inception Report.

The GEF Core indicators identified under Section II.C. will be used to monitor global environmental benefits and will be updated for reporting to the GEF prior to the project's terminal evaluation. The project team will be responsible for updating the indicator status. The updated monitoring data should be shared with evaluation consultants prior to required evaluation missions, so these can be used for subsequent ground-truthing. The methodologies to be used in data collection have been defined by the GEF and are available on the GEF [website](#). The required Protected Area Management Effectiveness Tracking Tool (METT) has been prepared and the scores included in the GEF Core Indicators (see Annex F of the CEO Endorsement document).

An independent terminal evaluation (TE) will take place upon completion of all major project outputs and activities. The terms of reference, the evaluation process and the final TE report will follow the standard templates and guidance for GEF-financed projects. The evaluation will be ?independent, impartial and rigorous?. The evaluators that will be hired to undertake the assignment will be independent from organizations that were involved in designing, executing or advising on the project to be evaluated. Equally, the evaluators should not be in a position where there may be considered for future contracts regarding the project being evaluated. The GEF Operational Focal Point and other stakeholders will be actively involved and consulted during the terminal evaluation process.

Table 7: Budgeted Monitoring And Evaluation Plan

M & E Activity	Responsibility	Estimated Budget (US\$) (Excluding Project Specific Staff Time)	Time Frame
Inception Workshop (one day) to: produce Annual Work Plan; Discuss Project Operations Manual, Roles, Responsibilities, Decision-making Structures, Gender Action Plan, Financial Reporting and Project Progress Reporting; and Present Supervision Plan	? CAF ? IC & partners participate	Indicative Cost: \$3,000	Within first 2 weeks of project start-up

Project Steering Committee Meetings (with formally prepared minutes and resolutions)	?	CAF ? IC	Indicative Cost: \$6,000	At least 5 meetings during the 60-month project cycle
Quarterly Financial Reports & SOEs	?	IC	Indicative Cost: \$18,000	Within 15 days of each completed month
Project Progress Reports	?	IC	Indicative Cost: PMC cost	Quarterly Reports due within 30 days after completed period.
External Final Evaluation	?	CAF ? IC & partners participate	Indicative Cost: \$10,000 to be paid by CAF (Professional Fees and logistical costs of Consultant)	Within last month of project implementation
Terminal Report	?	IC	Indicative Cost: PMC cost	Within one month of the end of the project
Audits	?	IC	Indicative Cost: \$15,000 (\$5,000/year)	Annual independent audits of IC's finances will be available each July of the following year. CAF reserves the right to request a partial or complete audit at their cost at any time.
Monitoring Visit to Project Site and process of Terminal Review	CAF		Indicative Cost: \$5,000 to be paid by CAF	At least once during project cycle.
TOTAL INDICATIVE COST EXCLUDING STAFF TIME			US\$42,000 (GEF and cofinancing) US\$15,000 (CAF)	

[1] See https://www.thegef.org/gef/policies_guidelines

10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCF/SCCF)?

The main socioeconomic benefits to be delivered by the project are described below, by project component.

Component 1

Freshwater is a very limited resource on Floreana Island, and the Galapagos Islands in general. Floreana Island's 140 human residents, livestock, and wildlife are largely dependent on the health of just two freshwater springs. Eradicating invasive rodents will help protect these springs by increasing vegetation cover across the island. This will convert eroded soils back into a ?sponge,? causing the groundwater layers to rise rather than fall. Capture of sea-fog (locally known as ?garua?) will be enhanced, resulting in more substantial precipitation. Additionally, increasing vegetation cover will reduce the temperature of the air column above the island, causing water vapor to condense, and thereby increasing rainfall. The net effect will be a positive increase in freshwater availability.

Eradicating invasive rodents and feral cats on Floreana Island will also promote recovery of native vegetation, which, in turn, will help maintain and re-establish the native fauna and secure the livelihoods of local people dependent on these habitats and their services. Habitat recovery will create the conditions necessary for the reintroduction of endemic species extirpated from the island. The more intact Floreana Island's ecosystems are, the greater their capacity to adapt to future environmental disturbance, including climate change.

The invasive alien rodents on Floreana Island deplete food supplies through the destruction of in-field crops, depredation of stored food and seed, and faecal contamination. The rodent impact is so substantial that entire fields of maize and cassava (locally called yuca) can be devastated even though rodent control measures are being actively applied. Eradication of invasive rats and mice will completely eliminate these crop losses. Invasive alien rodents also have a negative impact on fisheries through the consumption of inter-tidal species such as chiton and the endemic shellfish locally called ?churo.? The residents of Floreana Island are directly dependent on these marine resources.

Removal of feral cats and invasive rodents will eliminate primary vectors of diseases on Floreana Island, helping to safeguard the health of Floreana Island's wildlife, livestock, residents, and tourists. Invasive alien rodents are often attracted to human-built infrastructure. They feed, chew holes, urinate, defecate and nest in areas occupied by people. The presence of rodents in commensal areas can lead to an increased risk of disease, including lymphocytic clorio-meningitis, plague, leptospirosis, hantavirus, and salmonellosis. Once rodents are removed from commensal areas, the hygiene of a building and its contents can be better managed and human and animal health secured.

Feral cats also serve as reservoirs and critical hosts of parasites and disease and often live in the vicinity of human dwellings in order to take advantage of rodent populations and shelter. Cats carry several diseases in the Galapagos Islands that can infect both humans and wildlife. For example, cats are the critical host for *Toxoplasma gondii*, commonly known as the disease ?toxoplasmosis.? On Floreana Island, toxoplasmosis is a threat to human residents and visitors, as well as the endemic Galapagos sea lions (*Zalophus wollebaeki*), Galapagos penguins (*Spheniscus mendiculus*), and other wildlife. Symptoms of toxoplasmosis in native fauna include poor coordination, blindness, lethargy, respiratory and enteric distress, and sudden death. In infected people, similar symptoms are exhibited and may include spontaneous abortions.

The recovery of Floreana Island ecosystems (particularly the recovery of endemic species) has the potential to increase ecotourism income to the benefit of Floreana Island residents and other Ecuadorians. The Floreana community is in the process of developing a community-based tourism approach that is reliant on the natural and cultural resources of the island.

Component 2

Conservation of marine resources based on an approach that succeeds in achieving something approximating a sustainable yield harvest may impose short-term costs on artisanal and other commercial fishermen but is likely to enable very significant long-term benefits. At the same time, such strategies can

also support biodiversity conservation objectives. In the case of Galapagos and many other fisheries not characterized by fully effective community self-management systems, these benefits are more likely to accrue in a context of active enforcement which is active enough to remove incentives to rule-breaking.

Artisanal fishers are permitted to fish within the RMG. National fisheries are now recognizing the spill-over benefits to the sustainability of commercial fish species outside the MPA[1]. Positive ?spill-in? effects have also been quantified for yellowfin tuna and other pelagic fish which are harvested year-round by artisanal fishers[2].

[1] See,, e.g. Bucaram, et al. 2018 Assessing fishing effects inside and outside an MPA: The impact of the Galapagos Marine Reserve on the Industrial pelagic tuna fisheries during the first decade of operation. Marine Policy 87: 212-225.

[2] Unpublished analyses by Franz Smith and Alex Hearn.

11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification*

PIF	CEO Endorsement/Approva l	MTR	TE
Medium/Moderate			

Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

The Environmental and Social Risk screening exercise, using CAF-GEF safeguard policies, the Project Document annexes adequately cover stakeholder participation, gender mainstreaming and grievance mechanisms, which are also covered within the CEO Endorsement document. The use of pesticides in project Component 1 creates risks for the environment, non-target wildlife and people. However, the exemplary processes to identify risks, fill knowledge gaps and engage stakeholders to both understand

those risks and co-design risk management plans sets a strong foundation for these risks being adequately and proactively managed.

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
Annex 5A & 5B ES Safeguard screening	CEO Endorsement ESS	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Project objective	To safeguard the biodiversity of Galapagos Protected Areas by managing threats to terrestrial and marine biodiversity		
Indicators	? Number of invasive mammal species present ? Interception rate of non-compliant vessels entering unauthorized into RMG ? Management effectiveness of Galapagos Marine Reserve and Galapagos National Park		
Targets	? Invasive rodents and cats are eradicated from Floreana Island ? Twenty five percent of detected non-compliant vessels entering unauthorized into the RMG are intercepted by PNG authorities ? Management effectiveness of Galapagos Marine Reserve is increased from 73 to 75; Management effectiveness of Galapagos National Park is increased from 76 to 77		
Project Outcomes and Indicators	Baseline	Target at the end of the project	Outputs and Indicators
Component #1: Targeted eradication of invasive vertebrate species			

<p>Outcome 1: Invasive rodents (<i>Rattus rattus</i> and <i>Mus musculus</i>) and feral cats (<i>Felis catus</i>) are eradicated from Floreana Island, enabling the recovery and protection of 61 IUCN Red List threatened species, as well as vulnerable ecosystems, on a 17,253 ha island</p> <p>Indicator 1: Detection probability of invasive rodents and feral cats</p>	<p>Detection probability model indicates that populations of invasive rodents and feral cats are widespread on Floreana Island</p>	<p>Eradication of invasive rodents and feral cats is confirmed using a detection probability model, confirming that 100% of target populations have been removed</p>	<p>Output 1.1: All infrastructure in place and preparations completed, ensuring readiness for a safe and effective eradication process</p> <p>Indicator 1.1: Extent of completion of field preparations described in operational plan</p> <p>Target 1.1: 100% of required preparations completed</p> <p>Output 1.2: Operational plan for invasive rodent and feral cat eradication is fully implemented</p> <p>Indicator 1.2: Extent of operational plan implementation</p> <p>Target 1.2: 100% of required actions implemented</p> <p>Output 1.3: Monitoring and information systems are developed and used to confirm target species eradications</p> <p>Indicator 1.3: Results of rodent and cat eradication detection surveys</p> <p>Target 1.3: Rodent and feral cat eradication confirmed</p>
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Project Outcomes and Indicators	Baseline	Target at the end of the project	Outputs and Indicators
Component #2: Marine patrolling and enforcement			

<p>Outcome 2: The Marine Protection System (MPS) is implemented, protecting critical ecosystems within the Galapagos Marine Reserve from the threat of illegal fishing</p> <p>Indicator 2: Rate of interception of detected non-compliant vessels entering unauthorized into the RMG</p>	<p>Six per cent of detected non-compliant vessels entering unauthorized into the RMG are intercepted by DPNG authorities</p> <p>.</p>	<p>Twenty five percent of detected non-compliant vessels entering unauthorized into the RMG are intercepted by DPNG authorities</p>	<p>Output 2.1: Improved equipment to implement control and surveillance</p> <p>Indicator 2.1: Number of MPS recommendations that have started being implemented</p> <p>Target 2.1: Two MPS recommendations are being implemented (#8 and #10)</p> <p>Output 2.2: Skills of park rangers and DPNG legal department strengthened in control and surveillance techniques of the RMG</p> <p>Indicator 2.2.a: Number of MPS recommendations that have started being implemented</p> <p>Target 2.2.a: Two MPS recommendations are being implemented (#14 and #5)</p> <p>Indicator 2.2.b: Number and gender composition of staff trained</p> <p>Target 2.2.b: 30 staff, including 100% of female staff working in the area of control and surveillance (<u>Note:</u> These female staff will also receive leadership training)</p>
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Project Outcomes and Indicators	Baseline	Target at the end of the project	Outputs and Indicators
Component 3: Sustainability, knowledge, monitoring and evaluation			

<p>Outcome 3: Sustainability and knowledge are enhanced through development of a financial risk reduction mechanism, capture of lessons learned and monitoring and evaluation</p> <p>Indicator 3: <i>Process for establishing a financial risk reduction and a financial sustainability mechanism</i></p>	<p>No process</p>	<p>Target 3.1: Two roadmaps approved by PMC</p>	<p>Output 3.1: Roadmaps for an insurance scheme designed to reduce financial risks associated with reinvasion by alien invasive species and for issuance of Galapagos biodiversity green bonds</p> <p>Indicator 3.1: Number of roadmaps</p> <p>Target 3.1: Two roadmaps approved by PMC</p> <p>Output 3.2: Effective management of knowledge, based on learning and dissemination of project lessons and innovations</p> <p>Indicator 3.2: Specific technical lessons captured and disseminated for application in subsequent eradication</p> <p>Target 3.1: Three concrete lessons learned and available for replication</p> <p>Output 3.3: Project monitored and evaluated</p> <p>Indicator 3.3: Evaluation reports</p> <p>Target 3.3: One final evaluation report</p>
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ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

GEF-Sec comment	Response to GEF SEC (JUNE-29-2021)
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GEF-Sec comment	Response to GEF SEC (JUNE-29-2021)
1. On Project Information: Please correct the expected completion date to 10/14/2026 in order to match the 60 month duration.	Corrected
2. Please round the numbers in Portal for both the GEF Financing and Agency Fee as is the norm in GEF project submissions.	Numbers rounded
3. On M&E: Audits have been charged to the M&E budget. Please correct and charge M&E to the PMC.	Corrected
4. On the Budget: The budget included in the Annex E is missing a large part of the information provided in the Attached budget in the portal. Please include the entire budget table in Annex E (they can provide info per component instead of per output to make the table slimmer).	Revised budgets provided
5. Financial audit and Finance/Human resources Manager has been charged to the component along other items that should be charged to the PMC (cell phone, it support, computers, etc.). Per GEF practice please separate those items and provide differentiated costs for the operational items, Audits, Finance/Human resources Manager. We request CAF to make sure the budget submission follows our standard practices.	Revised budgets provided taking all points into account. see the annex file in the Road MAP-documents section.

GEF-Sec comment 5/19/2021	Response to GEF SEC
It is well noted that this project has considered gender dimensions and incorporated plans to address gender gaps (briefly described in the agency project document). We cannot locate the gender analysis or gender mainstreaming plan. Please provide the gender analysis and action plan.	? A gender analysis and mainstreaming plan has been added as Annex 11 to the CAF project document.

GEF-Sec comment 4/1/2021

Response to GEF SEC

? for indicator 1.2, the investment in removing a threat to biodiversity in terrestrial ecosystems will have an impact on the management effectiveness of the protected area, hence on the METT score. The rationale that the investments in the protected areas fall under 2.7 do not make sense.

Please revise the proposal and include a baseline score for the METT since the target of the intervention is the protected area, not productive landscapes.

The submission documents include the following changes, in response to these comments:

? A second METT has been added (see TT, Tab II-2), for Galapagos National Park, and section I of the tracking tool has been revised accordingly.

? METT target for Galapagos National Park has been added as an objective-level indicator to results frameworks in both documents

? Core indicator 1.2 (see table F and Annex F) have been added to cover the 789,088 terrestrial area of the National Park

Please explain in the footnote to the core indicators why the project is unable to provide indicators for Core Indicator 11. Please also reconsider the analysis of project impact on project beneficiaries and adjust core indicator 11 as necessary.

An estimate of 1,291 project beneficiaries, including 992 men and 299 women, has been added as Core Indicator 11 (see Table F and Annex F of CEO doc)

GEF-Sec comment 4/1/2021	Response to GEF SEC
4. Co-financing. In kind contribution from Island Conservation is not investment mobilized but should be categorized as recurrent expenditures. Blue Action Fund should be categorized as a donor.	Corresponding changes have been made to Table C of the CEO doc.
8. Core Indicators. Please fix the METT score which is currently listed as 2,330 as this is not possible. This number is in a number of places in the core indicators on the portal for METT scores.	The baseline METT score of 73 has been revised on the portal.
Part II ? Project Justification 1. Project Description. Please also clarify where in the document does it state how all associated capture and destruction methods will follow internationally accepted standards of humanely handling and disposing of animals.	The following sentence has been added to the Prodoc and CEO doc: ?The operational plan follows international best practice for IAS eradication, including processes for the humane treatment and disposal of species that will be eradicated.? (CEO doc, p.23; Prodoc p.34)
2. Project Description. Please provide a better description on how this project is related to the numerous previous investments on IAS in the Galapagos, how it builds on these and in particular the relationship operationally speaking with project # 9282.	A brief overview has been provided of past GEF support to IAS in the Galapagos (CEO doc, p.17; Prodoc, p.23). In addition, the description of the baseline situation regarding financial sustainability for IAS (which received support from one of the previous GEF projects) has been strengthened (CEO doc, p. 16-17; ProDoc p.22-23). Regarding the operational relationship with 9282, the timing and nature of the hand over across projects is summarized (CEO doc. p.17, 24; Prodoc, p.23, 36).

GEF-Sec comment 4/1/2021	Response to GEF SEC
<p>5. Project Description. Is the incremental reasoning, contribution from the baseline, and cofinancing clearly elaborated?</p> <p>Yes. But please see comment above on the baseline investments by GEF.</p>	<p>Baseline investments, particularly from GEF, have been more fully described (see above).</p>
<p>7. Project Description. Is there a better elaboration to show that the project is innovative and sustainable including the potential for scaling up?</p> <p>The GEF has invested a considerable amount of resources in the management of the Galapagos and more recently in address specific IAS issues. Please clarify the sustainability strategy for IAS management going forward so that the park can manage IAS going forward without relying on external assistance.</p>	<p>Component 3 includes the word ?Sustainability? in its title because of the great importance ascribed to financial sustainability for the project and its proponents. Work under this component has the potential to substantially reduce long-term financial dependence on external funding for invasive species eradication (CEO document, p.35; ProDoc p.54).</p>
<p>8. Project Map and Coordinates. Is there an accurate and confirmed geo-referenced information where the project intervention will take place?</p> <p>Please provide more detailed maps of Floreana and identify where on the island the eradications will take place.</p>	<p>A map of Floreana Island has been added to Section 1A of the CEO document. The idea of the eradications is of course to remove 100% of the invasive species in question from the entire island. In the case of invasive rodents and cats, this will require baiting across the full extent of the island. For this reason, it is not possible to show specific locations on a map.</p> <p>Coordinates have also been provided for Floreana.</p>
<p>13. Risk.</p> <p>Please provide a description on how the project will manage the risk posed by COVID-19 to project implementation.</p>	<p>A description of COVID-19 related risks and associated mitigation measures has been added to the risk table (CEO doc., p.46)</p>
<p>14. Coordination. Is the institutional arrangement for project implementation fully described? Is there an elaboration on possible coordination with relevant GEF-financed projects and other bilateral/multilateral initiatives in the project area?</p> <p>Yes but as noted above please provide more details on the relationship operationally speaking to this investment and project 9282.</p>	<p>The operational relationship has been described more fully (CEO doc, p. 17 & 23; Pro-doc p. 23)</p>
<p>19. Annexes:</p> <p>Project maps and coordinates</p> <p>See above for request for better detailed map of intervention sites on Floreana.</p>	<p>As noted above, a map of Floreana Island has been added to Section 1A of the CEO document, as well as to Annex E.</p>

Additional changes

1. An additional detailed budget, as well as a vehicle request form, have been provided for budgetary clarity (see Prodoc, Annexes 4a and 4D, p.74 and 77).
2. Envico Technologies Limited, an executing partner for Component 1, has very recently changed its name from ?Environmental Conservation Technologies?. All references to the new company name have been highlighted as changes, since the previous name was used in the original submission.

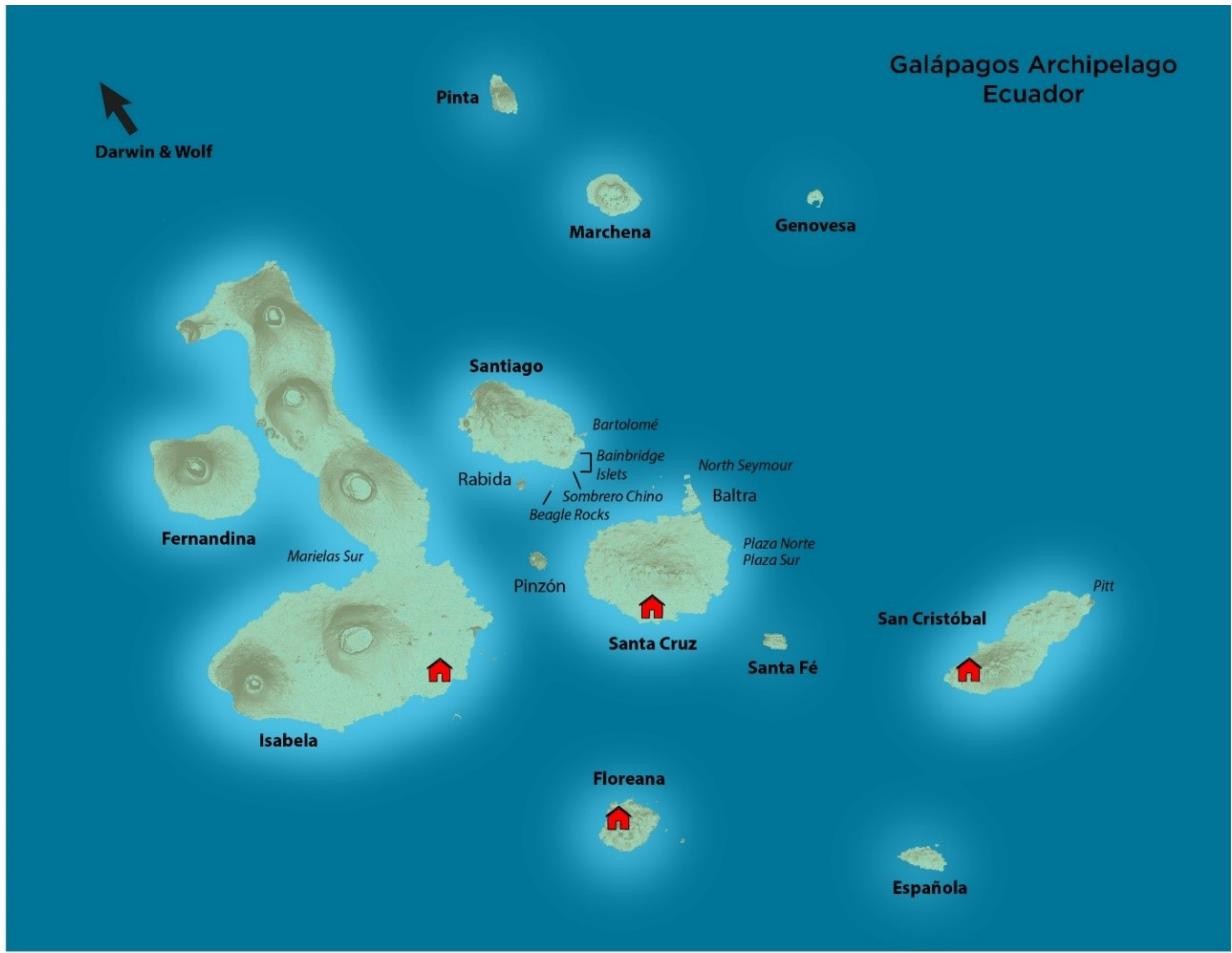
ANNEX C: Status of Utilization of Project Preparation Grant (PPG).
(Provide detailed funding amount of the PPG activities financing status in the table below:

N/A

ANNEX D: Project Map(s) and Coordinates

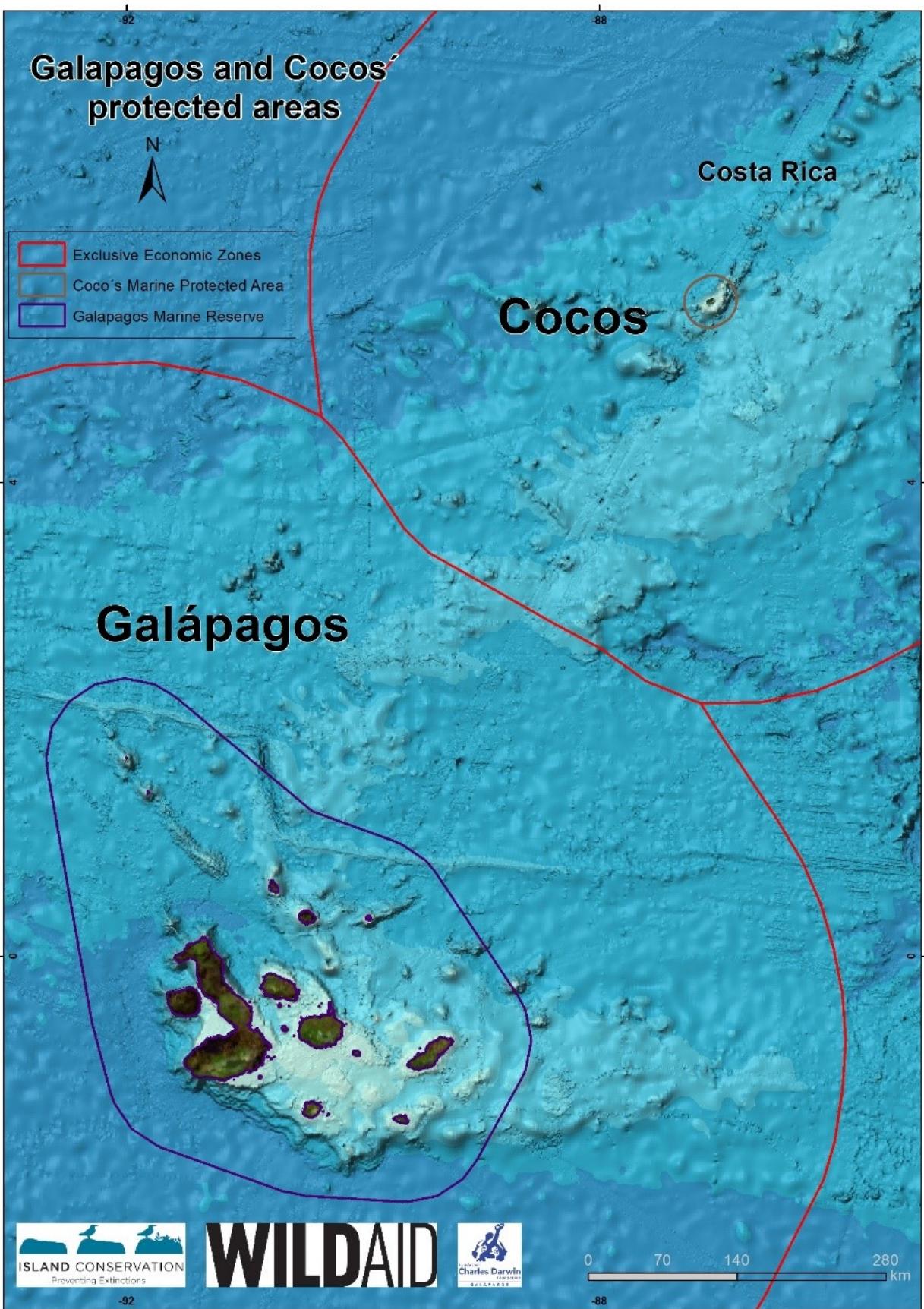
Please attach the geographical location of the project area, if possible.

Map of the Galapagos archipelago

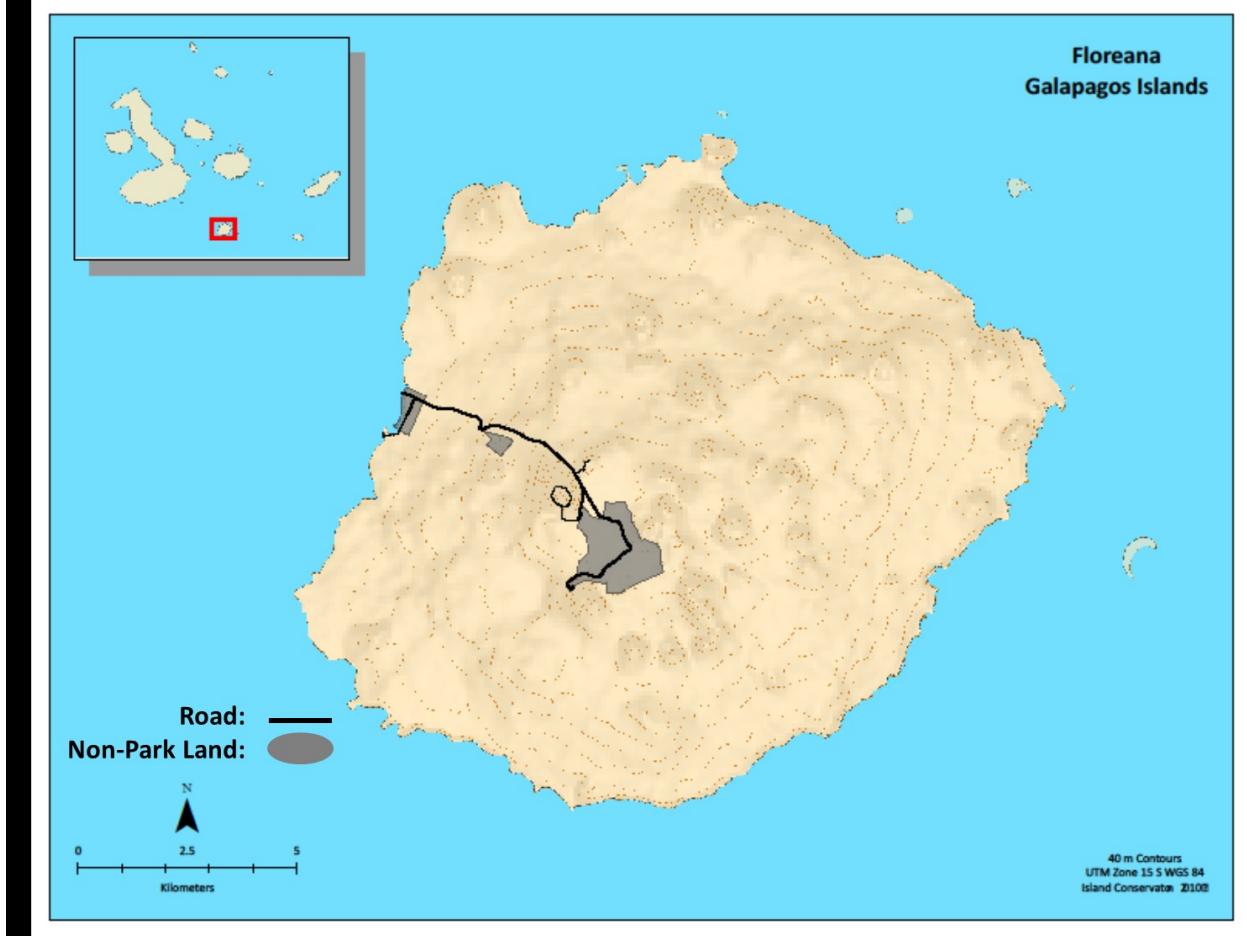


Note: Red houses indicate the major towns on the four human-inhabited islands

Map of the Galapagos Marine Reserve (blue line shows 40 nm limit)



Map of Floreana Island



ANNEX E: Project Budget Table

Please attach a project budget table.

GEF FUNDED BUDGET		Project budget by component (in USD)					Project budget per year (in USD)						
Category	Comments/Justification	C 1	C 2	C 3	PMC	Total	YR1	YR2	YR3	YR4	YR5	TOTAL	
Salary and Benefits Local	IC Project Management				65.625	65.625	13.125	13.125	13.125	13.125	13.125	65.625	
Salary and Benefits Local	Project Coordination				60.000	60.000	12.000	12.000	12.000	12.000	12.000	60.000	
Salary and Benefits Local	Component 1 execution	190.800				190.800	60.200	65.200	65.400			190.800	
Salary and Benefits Local	Component 2 execution		79.000			79.000	39.500	39.500				79.000	
Salary and Benefits Local	Component 3 execution			26.725		26.725	7.000	7.000	3.000	2.725	7.000	26.725	
Total Personnel Salaries and benefits		190.800	79.000	26.725	125.625	422.150	131.825	136.825	93.525	27.850	32.125	422.150	
Auditing fees	<i>Project Financial Audit</i>				20.000	20.000				10.000		10.000	20.000
Translation services or fees	<i>Translation of reports</i>				2.500	2.500				1.000	1.500		2.500
Consultant fees	<i>Independent terminal examination</i>				10.000	10.000						10.000	10.000
Consultant fees	<i>Consultant for Insurance Mechanism</i>			35.000		35.000	5.000	30.000					35.000
Total Professional Services		-	-	35.000	32.500	67.500	5.000	30.000	11.000	1.500	20.000	67.500	
Meals/ catering	<i>PMC meeting 1 face to face per year</i>			1.507		1.507	301	301	301	301	301	1.507	
Domestic airfare	<i>Travel between GPS and Quito</i>			2.700		2.700	450	450	900	450	450	2.700	
Hotel/ Lodging	<i>Trips to Quito or GPS for project related work.</i>			2.280		2.280	380	380	760	380	380	2.280	
Meals/ catering	<i>Trip to Quito or GPS meals</i>			1.680		1.680	280	280	560	280	280	1.680	
Total Travel, Meetings and Events		-	-	8.167	-	8.167	1.411	1.411	2.521	1.411	1.411	8.167	
External grants (sub-grants)	DPNG. 7 to 10 Outboard engines for DPNG patrolling vessels		220.000			220.000	220.000						220.000
External grants (sub-grants)	DPNG. Purchase/refit 2 speed boats for marine patrolling (without motors)		100.000			100.000	50.000	50.000					100.000
External grants (sub-grants)	DPNG. Purchase 2 pickup trucks and deliver to GPS		90.000			90.000	90.000						90.000
External grants (sub-grants)	Computer monitors and climate-control equipment for the control and surveillance center		10.000			10.000	10.000						10.000
External grants (sub-grants)	<i>Envico Technologies Limited: Drones for bait dispersal</i>	822.000				822.000	50.000	100.000	672.000				822.000
External grants (sub-grants)	<i>WildAid training/capacity building for DPNG staff</i>		40.000			40.000	20.000	20.000					40.000
Total Grants & Agreements		822.000	460.000	-	-	1.282.000	440.000	170.000	672.000	-	-	-	1.282.000
Total Equipment		-	-	-	-	-	-	-	-	-	-	-	-
Total GEF funded project costs		1.012.800	539.000	69.892	158.125	1.779.817	578.236	338.236	779.046	30.761	53.536	1.779.817	
CAF Fees 9%							1.940.000						1.940.000,00

ANNEX F: (For NGI only) Termsheet

Instructions. Please submit an finalized termsheet in this section. The NGI Program Call for Proposals provided a template in Annex A of the Call for Proposals that can be used by the Agency. Agencies can use their own termsheets but must add sections on Currency Risk, Co-financing Ratio and Financial Additionality as defined in the template provided in Annex A of the Call for proposals. Termsheets submitted at CEO endorsement stage should include final terms and conditions of the financing.

N/A

ANNEX G: (For NGI only) Reflows

Instructions. Please submit a reflows table as provided in Annex B of the NGI Program Call for Proposals and the Trustee excel sheet for reflows (as provided by the Secretariat or the Trustee) in the Document Section of the CEO endorsement. The Agency is required to quantify any expected financial return/gains/interests earned on non-grant instruments that will be transferred to the GEF Trust Fund as noted in the Guidelines on the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

N/A

ANNEX H: (For NGI only) Agency Capacity to generate reflows

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).

N/A