BEST
VOLUNTARY SCHEME FOR BIODIVERSITY AND ECOSYSTEM SERVICES IN TERRITORIES OF EUROPEAN OVERSEAS

EUROPEAN OVERSEAS

REGIONAL ECOSYSTEM PROFILE

Pacific

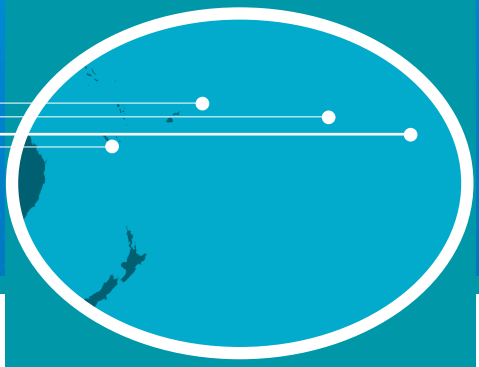
Pitcairn Islands

Wallis and Futuna

French Polynesia

Pitcairn Islands

New Caledonia



European Commission

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The European BEST III project is a joint effort by the BEST III Consortium:

http://ec.europa.eu/best

CONTENTS

ABBREVIATIONS

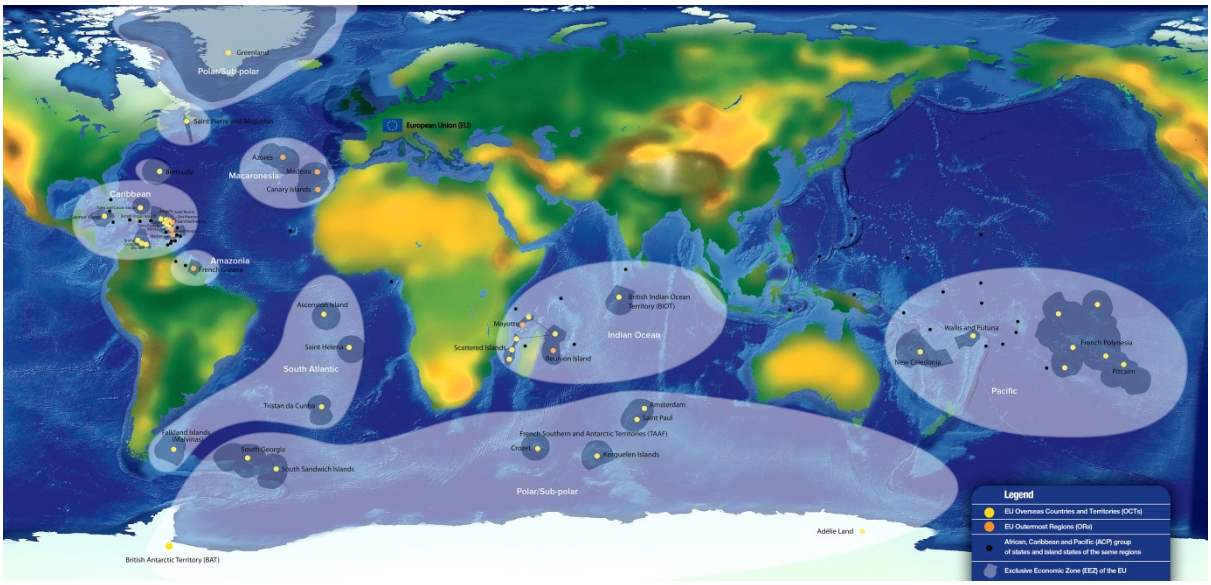
AZE	Alliance for Zero Extinction
CBD	Convention on Biological Diversity
CEPF	Critical Ecosystems Partnership Fund
CI	Conservation International
CITES	Convention on the International Trade in Endangered Species of Wild Fauna and Flora
CR	Critically Endangered
EN	Endangered
DD	Data Deficient
DFID	Department for International Development
EBA	Endemic Bird Area
EDF	European Development Fund
EEZ	Exclusive Economic Area
FCO	UK Foreign and Commonwealth Office
HMG	Her Majesty's Government
IBA	Important Bird Area
IUCN	International Union for the Conservation of Nature
KBA	Key Biodiversity Area
MEA	Multilateral Environmental Agreement
MPA	Marine Protected Area
NZ	New Zealand
OCT	Overseas Countries and Territories
OR	Outermost Regions
OTEP	Overseas Territories Environment Programme
PEMP	Pitcairn Islands Environment Management Plan
PIO	Pitcairn Islands Office
RSPB	Royal Society for the Protection of Birds
SDP	Strategic Development Plan
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
UKOTCF	UK Overseas Territories Conservation Forum
VU	Vulnerable

EXECUTIVE SUMMARY

The Pitcairn in the East Pacific is part of one of the seven regions in the world, in which European Union (EU) Overseas entities are located: from the Arctic to the Antarctic, in the Atlantic, the Pacific, and Indian Ocean, and even in parts of the Amazon. Combined their Exclusive Economic Zones (EEZs) make the largest marine area worldwide, covering 15% of the ocean. They host 20% of coral reefs and lagoons, provide the last refuge to 6% of globally threatened and endangered species and are acknowledged as biodiversity hotspots for their immense diversity of species, ecosystems and landscapes. Together, the 9 EU Outermost Regions (ORs) and 25 Overseas Countries and Territories (OCTs) host more than 70% of Europe's biodiversity.

The global importance of the rich, unique and valuable biodiversity in these regions as well as the ecosystems it depends on has been recognized internationally. Moreover, there is increasing awareness of the value of healthy ecosystems providing critical services that not only support local, regional economies and livelihoods but also offer cost-efficient climate change solutions. However, these ecosystems as well as the biodiversity are vulnerable and already affected by the impacts of climate change and other threats, as demonstrated in this ecosystem profile elaborated in a participatory approach with local and regional stakeholders under the **European BEST Initiative**[1].

Figure 1: Map showing the 34 Overseas entities of the European Union, located in 7 regions of the world (Credit: Imre Sebestyén/UNITgraphics © IUCN)



BEST – an initiative to promote conservation in the European overseas

The European BEST Initiative aims to strengthen biodiversity conservation and climate change adaptation in the 7 European Overseas regions by raising awareness, profiling the key biodiversity areas as priority areas for actions, supporting actions on the ground. To achieve these objectives knowledge hubs were established in the 7 EU Overseas regions and tasked to develop a regional ecosystem profile by assessing the current situation of the region's biodiversity, habitats and their threats based on the most recent scientific data and

[1] BEST – Voluntary scheme for Biodiversity and Ecosystem Services in Territories of European Overseas. For more information visit: http://ec.europa.eu//best/

observation and present them in the socio-economic and political context. Each regional knowledge hub has mobilized during 3 years local and regional actors and authorities in order to compile and discuss in a very participatory manner the latest available data feeding into the analysis before agreeing on priority areas for action for the region based on the outcomes of the species and ecosystems and threats assessments. Each ecosystem profile also includes an analysis of current conservation activities and relevant investments in the region.

Ecosystem Profiling Process

The profiling process follows the Critical Ecosystem Partnership Fund (CEPF) approach, which uses a process of developing "Ecosystem Profiles" with the help of local actors to efficiently guide on the ground actions as well as to identify and articulate an investment strategy for each region to be funded. The regional participation process assures that the final outcome is owned and used by stakeholders in the region.

By clearly outlining the challenges and needs of the region, this profile aims to increase awareness of European overseas biodiversity, as a foundation for further create support for development and implementation of mechanisms to improve policy and future investment strategies.

The biological importance of the Pitcairn Islands

The Pitcairn Islands are a group of four islands comprising: Pitcairn, Henderson, Ducie and Oeno, covering a total land area of 49 km^2. They are one of the world's most remote group of islands. Pitcairn itself (the only one of the four islands which is inhabited) had just 51 inhabitants in 2014, all living in the sole settlement, Adamstown.

The isolation of the Pitcairn Islands has led to the development of a distinct genetic identity and the emergence of highly specialized species with entirely new characteristics.

Image 2: Herald Petrel (*Pterodroma heraldica*) (© H. Shirihai) (left) and Henderson Petrel (*Pterodroma atrata)* (© M. Brooke) (right)

The native flora of the Pitcairn Islands consists of 81 species. Pitcairn Island itself boasts eleven endemic species of plants. Henderson Island has a total of 63 native floral taxa of which nine are endemic. The molluscan fauna of Henderson is diverse, with at least 16 species belonging to seven families, including seven endemic species. Pitcairn Island was found to support 26 species of land snail, including eight endemic species. There are five species of reef fishes in the near-shore waters surrounding Pitcairn and Henderson which

are also restricted to these islands. These islands support 24 bird species, of which six are considered endemic to the territory and five to Henderson.

The Pitcairn Islands have one of the best preserved marine ecosystems on the planet. Being a remote location with minimal human impacts, they are some of the last remaining places on earth where we can observe how coral reef ecosystems may have functioned in the distant past, before extensive human disturbance. These islands have significant coral cover despite being at the southern limit of coral distribution. In addition, the extreme water clarity surrounding the Pitcairn Islands allows for coral growth at depths greater than anywhere else in the Pacific. Deeper habitats may help improve the resilience of ecosystems against potential climate change impacts. They may serve as a refuge from global climatic threats and in this way may serve to increase ecosystem resilience.

Photo 3: Humpback whales off Bounty Bay, Pitcairn (© Robert Irving)

The biological importance of the Pitcairn Islands is recognized at the international level. Henderson has been a UNESCO World Heritage Site since 1988 on account of its singularity as being the world's only raised coral atoll with a virtually intact ecosystem. Oeno and Ducie, both pristine atolls, and Pitcairn (Brown's Water) are proposed Ramsar wetland sites of international importance. In March 2015, the UK Government indicated its intent to designate an Exclusive Economic Zone (EEZ) covering about 830,000 km² of pristine, clean and unpolluted waters around the Pitcairn Islands, making it as the world's largest marine protected area. All four islands were designated as Important Bird Areas (IBAs) in 2010, with Henderson also being designated an Endemic Bird Area (EBA) and an Alliance for Zero Extinction (AZE) site.

Photo 4: Henderson, East Beach (© R. Irving)

Conservation outcomes

A total of 4 Key Biodiversity Areas (KBAs) were identified. All **4 islands** (Pitcairn, Henderson, Ducie and Oeno) were selected **KBAs**. The chapter 4 is dedicated to the description of species and site outcomes.

Threats to biodiversity and ecosystems

The IUCN Red List identifies **47 globally threatened species** (CR, EN, and VU) across the terrestrial and marine environments of the Pitcairn Islands, which need immediate conservation actions. The main threats affecting Pitcairn Islands' (and Pitcairn Island in particular) biodiversity are posed by habitat clearance, spread of invasive species (including both animals - e.g., goats, cats, rats, mice, wasps, ants and fruit flies - and plants - e.g. *Lantana camara, Sorghum sudanense)*, small species' population sizes or restricted distributions and erosion. Even if human threats are still moderate, immediate action must be taken to prevent the degradation of this precious environment (details in chapter 8).

Current investments in conservation

Some programmes are currently involved in Pitcairn Islands. INTEGRE is the regional project for the Pacific and on Pitcairn the project seek to improve waste management practices, to combat soil erosion and to develop marine and fisheries legislation, sustainable fisheries and ecosystem management and create marine based ecotourism. The Darwin Initiative is a UK government grant, which has already funded several projects in the Pitcairn Islands. The Royal Society for the Protection of Birds (RSPB) is a UK charity which works to conserve not only birds but all forms of wildlife, and intends eradicates rats (important threat) on Pitcairn Islands. The conservation community and current investments in environment and conservation are described on chapters 7 and 9.

Priority areas for action

Following a consultation held with a number of actors involved in Pitcairn conservation issues, all four islands were selected as 'Key Biodiversity Areas' (marine and terrestrial interest), mainly based on their biological importance and the level of the existing threats to their biological diversity (chapter 10.1). These are considered as priority areas for action, which should be targeted by future investments.

Thematic priorities were also selected in a participatory manner. As a result of the consultations that took place between May and October 2015, the following **thematic priorities** were identified (chapter 10.2):

1. fight against invasive species and erosion,
2. ecological restoration and conservation of the natural environment,
3. research,
4. sustainable use of natural resources for economic purposes,
5. communication and awareness raising,
6. improved management of natural sites
7. capacity building.

Conclusions

The biological importance of the Pitcairn Islands is recognized at the international level. However, the biodiversity of Pitcairn Islands is highly threatened. The IUCN Red List identifies 47 globally threatened species (CR, EN, and VU) across the terrestrial and marine environments of the Pitcairn Islands, which need immediate conservation actions. The main threats affecting Pitcairn Islands' (and Pitcairn Island in particular) biodiversity are posed by habitat clearance, spread of invasive species (including both animals - e.g., goats, cats, rats, mice, wasps, ants and fruit flies - and plants - e.g. *Lantana camara, Sorghum sudanense*), small species' population sizes or restricted distributions and erosion. Even if human threats are still moderate, immediate action must be taken to prevent the degradation of this precious environment.

The results of this inclusive and comprehensive ecosystem profile serve as the basis for a regional investment strategy. This accompanying strategy presents priority areas for investment over the next 5 years with project ideas, also taking into account the current and past investments as well as the capacity for the implementation of conservation projects in the region.

Building on this intense analysis, consultation and discussion with 15 stakeholders involved on the regional ecosystem profile and investment strategy aim to inform local, national, regional, European and international decision makers, politicians and investors when planning future developments and prioritizing sustainable investments.

1. INTRODUCTION

EU Outermost Regions (ORs) and Overseas Countries and Territories (OCTs) are home to exceptional biodiversity. These 34 political entities include more than 150 islands and one Outermost Region in South America; French Guyana. Together they cover a total land area equivalent to the EU area, and a marine territory which is the largest of the world.

Europe Overseas biodiversity is very rich and particularly at risk. It is vulnerable to invasive species, development, and climate change impacts. For financial support (including for conservation), Europe Overseas is often not eligible to benefit from the same funding sources as their regional neighbours, often missing out on funds specifically targeted at their regional ecosystems and threats. At the EU level, funding mechanisms are often not adapted to meet the particular needs of Europe Overseas.

In order to improve the situation, the European Union has supported the creation of the BEST Initiative[2]. The BEST Preparatory Action adopted by the European Parliament has funded 16 on-the-ground projects, in 2011 (BEST I) and 2012 (BEST II), and has provided funding of the on-going BEST III project.

The outcome of the two open calls for proposals BEST I and BEST II showed: (1) a definite demand for Overseas funding, as the request exceeded more than six times the available budget and thus several projects passing all evaluation criteria could not be funded; and (2) a need to make this funding not a one-time effort, but to establish a financial support mechanism sustainable for years to come. The ongoing BEST III project aims to catalyze the transition to a European sustainable initiative that is recognized at an international level.

The consortium of BEST III is made of: IUCN - who is acting as the project coordinator -, with the following partners: French IUCN Committee, the WWF France, the UNEP SPAW Regional Activity Center (SPAW RAC), the Fundo Regional para a Ciência (FRC), the South Atlantic Environment Research Institute (SAERI), the French Antarctic and Sub Antarctic Territories, Conservation International (CI), the Critical Ecosystem Partnership Fund (CEPF), De Visu and One Agency-Ausy Belgium.

BEST III is:

- An open partnership bringing together experienced, local coordinators present in the field, a professional leading and supporting staff liaising with the European Commission, the CBD Secretariat, donors and high level scientific and funding experts as advisers;
- A field base and participative approach: 7 regional knowledge hubs[3], coordinated by staff involved in local projects, working for and with local stakeholders;
- A science-based action strategy: for each region, in consultation with local actors, BEST III will develop an Ecosystem Profile, a proven tool to guide long-term conservation efforts and investments;
- A funding opportunity, connecting projects in need of support with funders interested in saving biodiversity hotspots of international importance. BEST III is aiming at sharing funding opportunities and at inaugurating a long-term and sustainable funding mechanism for conservation projects in Europe Overseas.

[2] The acronym BEST stands for: Biodiversity and Ecosystem Services in Overseas Countries and Territories
[3] Pacific, Amazonian, Caribbean, South Atlantic, Macaronesian, Indian Ocean, Polar and Sub-polar

In the framework of the BEST III project, regional hubs are expected to prepare ecosystem profiles for each region. An ecosystem profile aims to:

- Bring together the conservation community around a common goal: making a shared diagnosis to establish priorities and identify investment priorities;
- Share data and knowledge;
- Assess the biodiversity situation – with a focus on the “exceptional” biodiversity for which the ORs and OCTs of each region have a global responsibility;
- Assess past and current conservation actions, including the legal framework;
- Assess threats, opportunities and gaps in funding;
- Analyse the range of actors working on biodiversity, their strengths and weaknesses, focusing on civil society;
- Define and prioritize actions needed most urgently for the protection of biodiversity and priority sites and define the basis of a strategy of action - based on previous items.

The Ecosystem Profile

The ecosystem profiling process follows a methodology, established by the Critical Ecosystem Partnership Fund (CEPF), adapted to the particular situation and needs of the EU Overseas. At the heart of this profiling process is a field-based, participatory and scientific approach: using a combination of desktop review of existing information and a series of consultations with local actors and authorities each ecosystem profile is developed to efficiently guide actions on the ground as well as to identify thematic conservation priorities and future projects to be considered for funding. The regional participation process assures that the final outcome is owned and used by stakeholders in the region to allow focussing research and management efforts and directing future funds to where their application can have the highest positive impact.

This ecosystem profile, coordinated by UICN France, presents an overview of the Pitcairn Islands in terms of its biodiversity conservation importance, major threats to and root causes of biodiversity loss, and the socioeconomic, policy and civil society context in which conservation takes place. The profile also presents assessments of patterns of conservation investment in the Pitcairn Islands over the last decade. It defines a comprehensive suite of measurable conservation outcomes at species, site and corridor scales and identifies conservation priorities at species (IUCN Red List threatened species) and site (Key Biodiversity Areas) scales, and prioritizes themes for conservation investment within them. These strategic directions are expected to be taken into account in the framework of the upcoming BEST funds and by all donors interested in supporting conservation efforts within the territory.

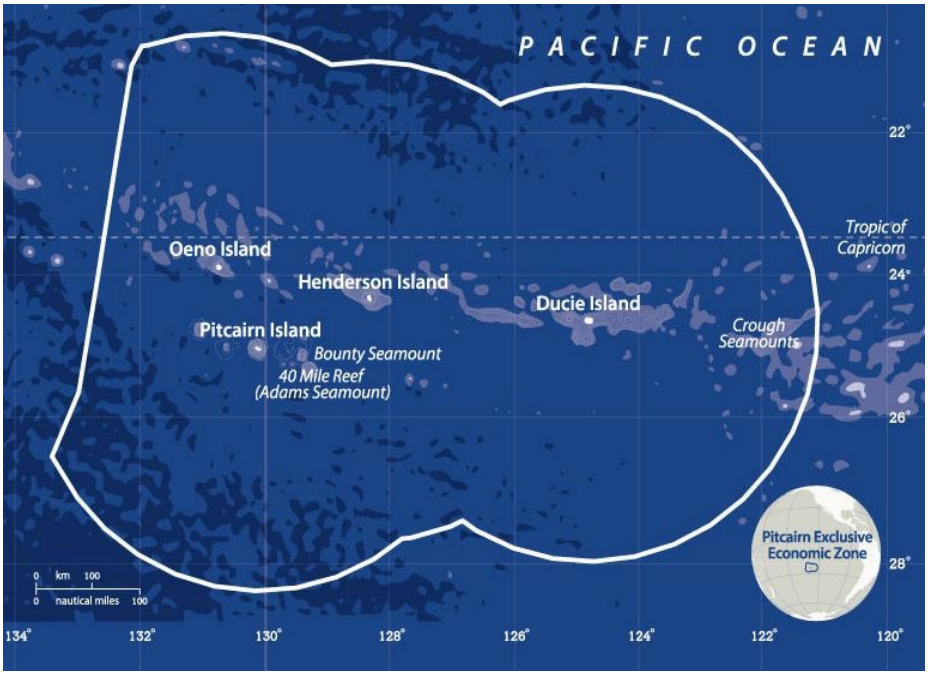
The Regional Investment Strategy

Based on the ecosystem profile a regional investment strategy is elaborated in collaboration with the regional and local stakeholders for donors interested in supporting civil-society-led conservation efforts in the region. Each investment strategy provides a clear picture of what the conservation priorities are and identifies niches, in which investment can provide the greatest incremental value for conservation, enabling donors and programmes to effectively target their efforts. It comprises strategic directions over the next 5 years and proposes

projects in line with the conservation priorities, taking into account current and past investments as well as the capacity of the region to implement proposed project ideas.

The accompanying investment strategy for the Pitcairn Islands presents potential projects to be funded, which were proposed by and discussed with civil society organizations (CSOs), local authorities, individuals and other entities in order to help implement the strategy by addressing the identified investment priorities. The investment strategy will not define concrete project concepts or specific project activities, which will have to be developed in accordance with future funding opportunities.

Image 1.1: The Pitcairn Islands group and its Exclusive Economic Zone (EEZ)



The results of this Ecosystem Profile are the basis for the elaboration of the accompanying regional BEST strategy, which aims to give strategic directions as well as concrete suggestions for activities and projects in the region, which are in synergy with relevant ongoing activities. This Investment Strategy provides a clear picture of what the conservation priorities are, identifying the niche where investment can provide the greatest incremental value for conservation, enabling donors and programmes to effectively target their efforts.

Image 1.2: Pitcairn Island, (© C. Vieux)

2. BACKGROUND

In 2005, an Ecosystem Profile was developed by CEPF for the extensive Polynesia-Micronesia region. However, the present EP – dedicated only on the Pitcairn Islands territory - allowed for much more in-depth stakeholder consultations and thus should not be understood as an "update" of the relevant parts within the 2005 CEPF document.

The Pitcairn Islands ecosystem profil was elaborated by the BEST III Pacific Est Team, coordinated by the IUCN French Committee, in collaboration with the BEST Central team, CEPF experts and supported by a process of local stakeholders consultation.

The EP presents an overview of the Pitcairn Islands biogeographical region in terms of its biodiversity conservation importance, major threats to and root causes of biodiversity loss, and the socioeconomic, policy and civil society context in which conservation takes place. The profile also presents assessments of patterns of conservation investment over the last decade. It defines a comprehensive suite of measurable conservation outcomes at species, site and corridor scales, and identifies priorities for conservation investment within these.

The profiling process took place between 2014 and 2016.

The preparation work was undertaken as a desk study during the first months of the ecosystem profiling process and included the compilation of an extensive list of references, relevant stakeholders, comprehensive databases on globally threatened species and sites under protection status in Pitcairn Islands, and collection of distribution data of target species.

The purpose of this ecosystem profil is to analyse existing data and highlight data gaps for investment (not to generate new data), based on available data sources (Red Lists, IBA data BirdLife, National Geographic Observation, etc.) to illustrate the depth of the analysis.

At the same time, the project was disseminated to stakeholders by email for a broader acknowledgment of BEST III in Pitcairn Island territory.

Unfortunately, despite numerous electronic reach outs to stakeholders; very little feedback was obtained in 2015 during the first round of consultation. The costs of visiting the islands itself was prohibitive and electronic follow-ups generated little interest.

The main highlights of consultations (mainly by email and bilateral consultations when stakeholder crossed French Polynesia Island) was:

- To strengthen the visibility of the project, and of the stakeholder engagement;
- To have a previous compilations of research and conservation needs;
- To secure access to distribution data and to maps of protected areas.

Image 2.1: BEST Team Meeting with a Pitcairn Biodiversity Expert, just back in French Polynesia from a few months spent in Pitcairn islands (© J. Kape)

The main points, highlighted by the actors during the exchanges were:

- The importance of taking into account the very special characteristics of the area (extreme isolation and complexity of implementation projects : a shuttle boat every 3 months, only about fifty people living, one inhabited island - Pitcairn, etc.);
- The importance to have a local ownership of projects in Pitcairn island (identify projects with the local population for greater ownership - but considering possible implementation by outside human resources, local people already working full time on the various activities of Pitcairn Island)
- Significant biological importance, and a number of threats to biodiversity, especially on the inhabited island of Pitcairn.

3. BIOLOGICAL IMPORTANCE OF THE AREA

On the whole, Pitcairn's biodiversity is quite well documented, even though some gaps still exist.

3.1 Geography

The Pitcairn Islands are a United Kingdom (UK) Overseas Territory, situated in the South Pacific, south-east of French Polynesia and half way between New Zealand and South America. The Pitcairn Group is one of the world's most remote group of islands. Pitcairn itself (the only one of the four islands which is inhabited) has just 51 inhabitants (2014), all living in the only settlement, Adamstown. The majority of Islanders are descendants of the mutineers of the British Royal Navy's Vessel "Bounty", who, with their Tahitian companions, settled at Pitcairn in 1790. The languages spoken are English and "Pitkern", a mixture of 18th century English and a Tahitian dialect of the first inhabitants.

The Pitcairn Islands are a group of four islands comprising: Pitcairn, Henderson, Ducie and Oeno covering a total land area of 49 km^2. Pitcairn is the peak of a dead volcano with an approximate land area of 4.5 km^2. It has a rocky coastline with steep, high cliffs and no natural harbours. The landscape is dominated by coconut palm trees, Norfolk pine trees, banana trees, breadfruit trees and a wide variety of other trees. Its climate is sub-tropical, with prevailing easterly winds. The average temperature is 21°C with about a 10°C difference between the warmest and coldest months. Typhoons may occur between November and March. The highest point on the island is Pawala Valley Ridge at 347 m.

Image 3.1: View of Pitcairn from the west in the evening light (© R. Irving)

Henderson Island, an elevated coral atoll, is 43 km^2 and is situated 193 km (120 miles) northeast of Pitcairn. The old lagoon floor of the island is now raised to an elevation of about 30 m. There is a fringing reef 30 - 200 m wide on the north, north-west and north-east sides of the island, backed by a wide beach. It was declared a World Heritage Site in 1988, on account of its unique natural environment of endemic plants, insects and seabirds. In August

2011, the Royal Society for the Protection of Birds (RSPB) carried out a comprehensive rat eradication programme to protect and restore the natural wildlife on the island. However, the attempt was unsuccessful and the rat population has now returned to pre-2011 numbers. In the past, the island was visited regularly by Pitcairn Islanders to harvest the miro and tau trees used for carving wooden souvenirs, but in recent years the trees have been left to rejuvenate and to permit a more sustainable harvest.

Image 3.2: Henderson, East Beach (towards South) (© R. Irving)

Ducie Island is an atoll about 470 km (290 miles) to the east of Pitcairn. It is the southernmost atoll in the world. It consists of four islets (motus) surrounding a lagoon. It is the smallest of the four Pitcairn Islands with an overall area of 3.2 km^2 of which 0.74 km^2 is emergent land rising 1-2 m above sea level. Acadia, the largest islet of the atoll is 2.5 km long and 250 m wide, with a maximum elevation of 3 m. Ducie is generally not visited by Pitcairners due to its vast distance from Pitcairn.

Image 3.3: Ducie, aerial view (© SPSCEPI)

Oeno Island is about 143 km (89 miles) to the northwest of Pitcairn and consists of a coral atoll surrounded by a large reef-protected lagoon. The lagoon is 4 km in diameter and uniformly shallow (3m) with scattered coral reefs separated by sand. To the north, there is a passage where shallow draft boats (including Pitcairners'itcairnersabout 143 km (89 miles) Pitcairners visit the island occasionally.

Image 3.4: Oeno, aerial view (© K. Garcia)

The Pitcairn Islands have an Exclusive Economic Zone (EEZ) covering about 830,000 sq km. The waters are pristine, clean and unpolluted. In partnership with the Pew Charitable Trusts and National Geographic, the Pitcairn Island Council submitted in November 2012 a proposal to the UK Government to create the worldlded by sand. To thearine Reserve, an area that encompasses the entirety of Pitcairn's EEZ, with the exception of an area of 12-mile radius surrounding the island of Pitcairn, which would allow for the continuation of local fishing activities. In March 2015, the UK Government indicated its intent to designate the EEZ as the worldrldtion of an area of 12-mile radius surrounding the island of Pitcairn, which would allow for the continuation of local fishing activities. In March 2015, the UK G

3.2 Ecosystems

Recent botanical research on Pitcairn Island identified 14 plant communities: four coastal, six forest, two fernlands and two scrub communities. Large areas are covered by non-native scrub vegetation, and by monospecific dense stands of *Syzygium jambos* (rose-apple). Less than 30 % of the island is covered by native forest, and these areas are limited to remote valleys. Fernlands also cover large areas, including both eroding areas and ridge tops. Coastal vegetation comprises rock and cliff communities with limited strand vegetation (Kingston and Waldren, 2003). Pitcairn has suffered intense deforestation and the only natural forests remaining are on the ridge of the central mountain.

Henderson has been a UNESCO World Heritage Site since 1988. Its ecology is still virtually intact on the majority of the island and, with the exception of the introduction of rats, has not been damaged by human activity. Its plateau is protected from the periodic inundation of the sea during cyclones. This has allowed the continued existence on the island of colonising species and, as a result, a diverse fauna and flora has developed with many endemic elements. Henderson has a fringing reef between 30-200 m wide to the north, north-west and north-east sides of the island, backed by wide beaches. The reefs off these beaches are seaward-sloping reef platforms without reef crests, and are not typical fringing reefs (Irving, 1995; Procter and Fleming, 1999). For the southern half of the island, fringing reefs are absent, with wave-eroded bedrock being sparsely colonised by resilient coral species.

Oeno and Ducie are proposed Ramsar wetland sites of international importance. They are both pristine atolls, from which Pacific rats were eradicated in 1997. The central lagoon at Ducie shows well-preserved dead corals, encrusted by a live coral assemblage. It is believed that the formerly-abundant corals are likely to have been killed by periodic influxes of cold water to this island, which is at the southern limit of coral growth in the Pacific. Oeno is a low coral atoll with a maximum elevation of 1-2m and an overall area of 1.6 km^2. It consists of a small central islet within a shallow lagoon. A sandy promontory of this islet becomes a separate islet in its own right from time to time, as water currents move sand around within the lagoon (R. Irving, pers. comm. 2015).

The national Geographic/Pew expedition in 2012 found high coral cover at Ducie (56%). This is exceptional considering this island is the southernmost atoll in the world and near the easternmost limit of coral reef distribution in the Pacific. The coral cover is comparable to several other significant high latitude reefs. Oeno and Henderson also have significant coral cover (28% and 24%, respectively) despite being at the southern limit of coral distribution. At Pitcairn the National Geographic/Pew expedition found a deep coral reef (developing below 35 m depth) that had not been recorded previously, with a remarkable 26% of the bottom covered by live coral. The coral cover of mesophotic reefs at Pitcairn is higher than those observed at similar latitudes in the Northwestern Hawaiian Islands (17%) and consisted of a wide range of species. The extreme water clarity surrounding the Pitcairn Islands (measured up to 75 m at Ducie) allows for coral growth at depths greater than expected for most Pacific reefs. This deeper available habitat may help build resilience into ecosystems from potential climate change impacts (Friedlander et al. 2014).

Reef monitoring at Pitcairn is on-going as part of the Polynesia Mana Coral Reef Monitoring Network, managed by the CRIOBE research centre based in French Polynesia. The data collected around Pitcairn show a relatively low coral cover that seems to slowly increase (G. Siu, pers. comm. 2015).

3.3 Biodiversity

The species found in the Pitcairn Islands are likely to have migrated from the nearest land (most likely to be the Gambier, Tuamotu and Austral island groups of French Polynesia). They have been confined to these isolated islands ever since. Over time, this isolation has led to the development of a distinct genetic reservoir and the emergence of highly specialized species with entirely new characteristics.

Pitcairn Island itself boasts about ten species of plants which are endemic and at least eight species of land snail, whilst all four islands are home to five endemic species of reef fishes, five species of marine molluscs and three species of echinoderms. Henderson Island itself hosts five endemic species of bird and dozens of endemic invertebrates (R. Irving, pers. comm. 2015).

Plants

Ducie has an extremely impoverished vascular flora with only two species having been recorded. Oeno has a mix of trees and shrubs growing on its central islet, though it remains a relatively limited vascular flora. Henderson and Pitcairn support considerably richer floras with a high number of endemic and endangered species (Procter and Fleming, 1999).

The Pitcairn Islands count 81 species of indigenous vascular plants, of which 10 are endemic. The flora of Henderson Island contains some 63 native higher plants including nine endemic species (Kingston and Waldren, 2005).

A list and Red List threat status (whenever available) of the most significant species of plants of the Pitcairn Island Group is presented by Procter and Fleming, in “Biodiversity: the UK Overseas Territories” (1999):

Trees and shrubs

Abutilon pitcairnense (Malvaceae) (Yellow fatu): a shrub, endemic to Pitcairn. Thought to be probably extinct until a few years ago (a site known 20 years ago was searched without success), some specimens of the plant have been recently propagated.

Image 3.5: Yellow fatu (© YDr Noeleen Smyth)

Bidens hendersonensis hendersonensis (Compositae): a shrub or tree endemic to Henderson Island.

Bidens hendersonensis oenoensis (Compositae): a tree or shrub endemic to Oeno Island. A botanical expedition in 1991 failed to find any living specimens despite thorough searches.

Bidens hendersonensis subspathulata (Compositae): a variety endemic to Henderson Island.

Bidens mathewsii (Compositae) (Alihau) (VU): endemic to Pitcairn.

Image 3.6: Bidens mathewsii (© J. Craw)

Coprosma rapensis benifica (Rubiaceae): a small tree endemic to Pitcairn Island found in degraded areas of forest at moderate altitude. Only ten individuals of flowering size seen in 1997.

Geniostoma hendersonense (Loganiaceae): a shrub endemic to Henderson. No specific threats have been identified and no conservation measures are required.

Glochidion comitum (Euphorbiaceae) (EN): apparently endemic to Pitcairn Island, this species has only recently been described as distinct from *G. pitcairnense*.

Glochidion pitcairnense (Euphorbiaceae) (VU): a tree known only from Henderson and Pitcairn Islands and from Mangareva in the Gambier Islands (French Polynesia). On Henderson the species is relatively common. The population is smaller on Pitcairn, where it is threatened with cutting and the spread of the invasive *Syzygium jambos*. No regeneration has been observed.

Hernandia stokesii (Hernandiaceae) (VU): recorded from Henderson Island.

Homalium taypau (Flacourtiaceae) (VU): restricted to hillsides and valleys on Pitcairn Island the species is still common and forms the dominant component of the vegetation that remains. The spread of invasive exotics such as *Syzygium jambos* and also the loss of habitat pose some threat.

Ixora fragrans (Rubiaceae): a shrub possibly endemic to Henderson.

Myrsine hosakae (Myrsinaceae) (VU): one of the least common of the Henderson Island endemics.

Up to 7,000 individuals may exist, scattered in the plateau forest.

Myrsine aff. niauensis (Myrsinaceae): not found in 1997, only two collections known. Restricted to Pitcairn and apparently endemic. Probably extremely rare, less than 250 plants estimate to survive.

Nesoluma st.-johnianum (Sapotaceae) (VU): a common tree endemic to Henderson Island.

Santalum insulare hendersonensis (Santalaceae): endemic to Henderson Island.

Sesbania coccinea atollensis (Leguminosae): this shrubby subspecies is endemic to the eastern Pacific and is very rare on Henderson. The population is probably considerably less than 50 individuals.

Xylosma suaveolens haroldii (Flacourtiaceae): a tree endemic to Henderson and Pitcairn Islands. On Henderson it is widespread in plateau forest and drier areas. The population on Pitcairn has declined through habitat loss and cutting.

<u>*Non-woody plants*</u>

Angiopteris chauliodonta (Marattiaceae) (Nehe fern): a large fern endemic to Pitcairn. Extremely rare with only two populations known with a population size of probably less than 20.

Ctenitis cumingii (Dryopteridaceae): a fern, endemic to Pitcairn. Very rare, population thought to consist of less than 25 individuals. Threats include the spread of exotic species, maintenance work on trackways and damage to native vegetation.

Peperomia hendersonensis (Piperaceae): a succulent, terrestrial or epilithic herb with decumbent branches, endemic to Henderson. Widespread and common.

Peperomia pitcairnensis (Piperaceae): a small herb, apparently endemic to Pitcairn, but the taxon is very poorly known.

Algae

During a National Geographic/Pew expedition carried out in 2012, 64 macroalgal taxa (21 green algae, 12 brown algae, and 31 red algae) were recorded, 51 of which are new records for these islands. Algal species richness was greatest at Pitcairn and Henderson (42 and 31 taxa, respectively), followed by Oeno (24) and Ducie (13). Only three species of algae were common to all four islands: the brown alga *Lobophora variegata* and the encrusting corallines *Hydrolithon onkodes* and *H. gardineri (*Friedlander et al., 2014).

Invertebrates

Almost all the insects on Henderson are derived from sources to the west and a high proportion are likely to be indigenous. The orders showing the most diversity are *Lepidoptera* (c. 53 spp.), *Coleoptera* (c. 38 spp.), *Diptera* (c. 37 spp.), *Hymenoptera* (c. 21 spp.), *Homoptera* (c.14 spp.) and *Heteroptera* (4 spp.). The weevils, *Heteroptera* and *Homoptera* show considerable endemism (Procter and Fleming, 1999). The biodiversity of the arthropods on Henderson is markedly small, which is perhaps due to the location of the island, topographic uniformity of the central plateau and its comparative youth. The mite fauna is rich (particularly in oribatids) and many are endemic. In addition, there are in the region of 26 species of spider and nine species of isopod, with three endemic to Henderson. Species belonging to the taxa Diplopoda, Chilopoda, Amphipoda, Pseudoscorpions, Diplura, Protura and Collembola are also represented (Benton & Lehtinen 1995).

Molluscs

The land snail fauna of the Oeno and Ducie atolls is poor and each atoll supports fewer than six species. The molluscan fauna of Henderson is more diverse, with at least 16 species belonging to seven families, including seven endemic species. Pitcairn Island was found to support 26 species of land snail, including eight endemic species. Seven of these species are thought to be prehistoric adventives and a further three are likely to be prehistoric introductions (Procter and Fleming, 1999). The main threats to the land snails on the Pitcairn Islands are the invasion of the exotic roseapple (Benton & Spencer 1995) and predation by the Pacific rat which is presumed to have been responsible for the extinction of at least six species (Preece 1995a).

The marine molluscan fauna of the Pitcairn Islands comprises of 80 taxa recorded on Ducie and Pitcairn, 240 on Oeno and 320 on Henderson (Procter and Fleming, 1999). Significant faunal differences occur between the four islands in the group, which are related to the different character of each island. Most of the fauna is composed of widespread Indo-West Pacific species, with a few appearing to be endemic (Preece 1995b).

Coral

The National Geographic/Pew scientific expedition carried out in 2012 observed coral assemblages which were significantly different among islands, with Ducie having the highest coral cover (56%) and with the lowest coral cover observed at Pitcairn (5.2%). A total of 70 species of scleractinia (hard corals) were observed around the four islands, with 23 new records for the island group as a whole. Species richness was positively correlated with the geological age of the islands, with the oldest island Oeno having the highest number of coral species (58), followed by Henderson (53 species), Ducie (35 species), and Pitcairn (24 species) (Friedlander et al., 2014).

Echinoderms

Records of different species of echinoderms were recorded at Ducie in 1971 (Rehder & Randall, 1971) and at Henderson in 1991 (Irving, 1995). Rehder and Randall reported the presence of: Crown-of-Thorns starfish (*Acanthaster planci*), *Diadema savinnyi* or *D. setosum* (very common on the outer reef from 20 to at least 80 feet), *Heterocentrotus mamillatus* (very common with the preceding species) and *Heterocentrotus trigonarius* (abundant on the outer third of the reef flat in several feet of water).

Vertebrates

Birds

The four islands of the Pitcairn Islands Group are considered Important Bird Areas (IBAs) by BirdLife International for a total area of 6,000 ha. These islands present 24 bird species, of which 12 are listed as globally threatened birds by the IUCN Red List (2015) (see table 4.3) and six are considered endemic of the territory (BirdLife International, 2013).

Six endemic birds are found in the Pitcairn Islands: the Henderson Reed-warbler (*Acrocephalus taiti*), the Henderson Petrel (*Pterodroma atrata*), the Henderson Fruit-dove (*Ptilinopus insularis*), the Henderson Lorikeet (*Vini stepheni*), the Henderson Crake (*Zapornia atra*) and the Pitcairn Reed-warbler (*Acrocephalus vaughani*) (BirdLife International, 2013). Henderson is thus considered by BirdLife International as an Endemic Bird Area (EBAs). The Henderson Crake (known by Pitcairners as the chicken bird) numbers between 3,240 and 6,200 individuals on the island, so it is not scarce. The Henderson Fruit Dove has a population numbering about 3,000 individuals. The Henderson Lorikeet is the scarcest of the landbirds, numbering about 1,200 individuals. The Henderson Reed Warbler is the most numerous, with a population numbering about 10,000. The Pitcairn Reed Warbler is Pitcairn's only land bird. It appears to be distributed throughout the island in all habitats (Procter and Fleming, 1999). The most recent addition to Henderson's list of endemic birds is the Henderson petrel, which since 1996 has been recognised as a species in its own right (and not just a dark morph of the Herald petrel *Pterodroma heraldica*). It is estimated there are 16,000 pairs which nest on Henderson (Brooke, 1995).

The islands also support large and internationally significant seabird populations, with the major seabird families being Procellariidae (petrels and shearwaters) and Laridae (gulls and terns) (BirdLife International, 2013). Oeno, Ducie and Henderson are all important areas for seabirds, hosting more than 10,000 pairs on a regular basis. Over 90% of the world's Murphy's Petrels (over 200,000 breeding pairs) nest on Ducie, making the atoll of supreme importance for this species. It is also important for two other surface-nesting petrels*:* the Herald and the Kermadec (Sanders, 2006). Henderson Island is the nesting site for 12 different seabird species including 4 types of petrels.The Henderson Petrel was described as a new species in 1996 (Brooke & Rowe, 1996).

Image 3.7: Herald Petrel (*Pterodroma heraldica*) (© Tubenoses Project © H. Shirihai) (left) and Henderson Petrel (*Pterodroma atrata)* (© M. Brooke) (right)

Marine life

Because of their relatively high latitude and distance away from the Coral Triangle – the centre of marine biodiversity in the Indo-Pacific – the Pitcairn Islands have relatively low species richness for most marine taxa. This isolation and their subtropical location, however, make them interesting from a biogeographic perspective as they lie at the eastern limits of the Indo-Pacific Province. In addition, remote locations with minimal human impacts are some of the last remaining places on earth where we can observe how coral reefs may have functioned in the distant past, before extensive human disturbance (Friedlander et al., 2014). The National Geographic Society/Pew expedition undertaken in 2012, reported unaltered deep sea habitats of the Pitcairn Islands harbouring unique biodiversity including fish species new to science. “The Pitcairn Islands have one of the best preserved marine ecosystems on the planet and their fauna has a relatively high degree of endemism. Human threats are still small but quick action must be taken to prevent the degradation of this precious environment. “The seamounts and deep habitats of the Pitcairn Islands appear to be still untouched and pristine” (Sala et al., 2012).

Fishes

A total of 348 species of marine fishes are recorded from the four Pitcairn Islands (Randall, 1999). Of the reef fishes, the family showing the greatest representation is the Labridae with 21 species (Irving *et al*. 1995). Five species of reef fishes in the near-shore waters surrounding Pitcairn and Henderson are restricted to these islands. These are the Pitcairn sandlance *Ammodytoides leptus*, the Pitcairn many-spined butterflyfish *Hemitaurichthys multispinosus*, the Henderson triplefin *Enneapterygius ornatus* and the Henderson squirrelfish *Sargocentron megalops*. The fifth is a species of combtooth blenny *Alticus* sp. which is found at both Pitcairn and Henderson.

An integrated ecological assessment of the marine environment of the Pitcairn Islands carried out in 2012 reported high species’ richness. The greatest richness was found at Henderson and Oeno (151 species for both), followed by Pitcairn (145), and Ducie (123). Scientists found high levels of regional (southeastern tropical Pacific including southern French Polynesia and Easter Island) endemism in the fish assemblages across the islands (45%). The highest numerical abundance of regional endemics was found at Ducie (56%) with the lowest at Pitcairn (29%) (Friedlander et al., 2014).

Marine Turtles

Both green turtles *Chelonia mydas* (EN) and hawksbill turtles *Eretmochelys imbricata* (CR) occur around the Pitcairn Islands. A small number of green turtle females (c. 10) have been recorded nesting on the East Beach of Henderson Island (Brooke, 1995).

Marine Mammals

There is little information available about the marine mammals of the Pitcairn Islands.

The first documentation of humpback whales (*Megaptera novaeangliae*) around Pitcairn Island was provided by C. Horswill in 2007. Land-based surveys were conducted from Pitcairn Island from June to August 2007 in order to monitor the presence of humpback whales in the surrounding near-shore waters. The highest sighting frequencies occurred in late August, with mother and calf pairs also becoming more prevalent during this period. A total of 35 whale sightings were made during the three months, totaling 49 whales in all, though it is thought the maximum number which occur around the island at any one time is in the region of 10 individuals. There is no anecdotal history of humpback whales at Pitcairn Island previous to 1990 which may suggest a recent geographical shift in the easterly range of Oceania humpbacks. The findings extend the known easterly range of humpbacks within Oceania (western and central South Pacific Ocean). It is possible that the near-shore pristine waters of Pitcairn Island may be an important mating and calving ground for the humpback sub-population associated with French Polynesia, or potentially, with another undocumented, more remote area in the central South Pacific (Horswill and Jackson, 2012). The humpback whale sightings project was restarted in 2014 as part of the Darwin Initiative project. In August 2015, young calves were observed at Henderson, their small size indicating that there was a high likelihood that they were born within Henderson's waters (R. Irving, pers. comm.).

Within the framework of the study undertaken in 2007, approximately 10 pilot whales (*Globicephala* sp.) were also sighted on transit to the island 8 km east of Pitcairn Island in April 2007. A stranded Cuvier's beaked whale (*Ziphius cavirostris*) was found by three scientists (G. Wragg, J. Jamieson and R. Irving) on Ducie in 1991. Short-finned pilot whales (*Globicephala macrorhynchus*) are documented to occur in the region. This is also confirmed by seasonal tourism workers, who reported minke whale (*Balaenoptera* sp.) and a large pod of unidentified dolphins within the Pitcairn Islands group (Horswill and Jackson, 2012) as well.

Monitoring wildlife

At present, there are no Species Action Plans in place and monitoring and review procedures are neither anchored in legislation nor put into practice.

There is no specific process for monitoring wildlife, but the island has a Director of Biosecurity. Studies are also conducted at various times by visiting scientists. Monitoring changes in the island's fauna and flora is difficult because of the island's exceptional remoteness and roughness – the very features that have contributed to preserving it thus far (European Commission, 2015).

4. CONSERVATION OUTCOMES

The conservation objectives presented in this chapter refer to species and sites that should be a priority for the preservation of biodiversity in the Pitcairn Islands Group. Conservation objectives were identified following a methodology proposed by the Critical Ecosystems Partnership Fund (CEPF), which has agreed to adapt its standard methodology to the needs of the BEST III project.

For the purpose of this study, the objectives concerning the species have been identified using the IUCN Red List of Threatened Species (http: // www. redlist.org).

Most globally threatened species can be better preserved by protecting the sites where they are located or with which they are interacting. Thus, the process of defining conservation outcomes for the species is closely related to the identification of a set of Key Biodiversity Areas (KBA), which represent here the conservation objectives in terms of sites. The choice of KBA is based on the regular presence of globally threatened or endemic species and on other criteria, which are presented in part 4.3.

4.1 Species

For the purpose of our project, we considered the IUCN Red List globally threatened species corresponding to the following categories: "Critically Endangered" (CR) "Endangered" (EN) and "Vulnerable" (VU). Species in the category "Data Deficient" (DD) have not been included in our analysis because they are considered a priority for research but not necessarily for conservation.

The current Red List available online at the time of writing (2015) identifies 47 globally threatened species (CR, EN, and VU) for the Pitcairn Islands terrestrial and marine environments. A comprehensive list of globally threatened marine and terrestrial species is available below (tables 4.2 to 4.6). The number of threatened taxa grouped by taxonomic group according to the IUCN Red List is provided in the table below (Table 4.1).

Table 4.1 Summary of globally critically endangered (CR), endangered (EN), and vulnerable (VU) species according to the UICN Red List (last update for some taxonomic groups: 2014)

	Plants	Molluscs	Birds	Fishes	Corals	Marine Mammals	Echinoderms
CR	1	-	-	-	-	-	-
EN	1	-	4	2	-	2	-
VU	5	5	8	7	11	-	1
Total	7	5	12	9	11	2	1

Note: the green turtle *Chelonia mydas* and the hawksbill turtle *Eretmochelys imbricata* are not included in the above table because they are not officially classified as globally threatened (CR, EN and VU) species.

Nevertheless, they are classified as respectively EN and CR in the regional Red List for Oceania (UICN Red List, May 2015).

Table 4.2 List of UICN Red List of globally threatened plants present in the Pitcairn Islands (CR, EN and VU) (source: http://www.iucnredlist.org/ downloaded May 2015).

Genus	Species	Common name/description	Island	Red List status	Year assessed
Meryta	*brachypoda*	Shrub or small tree	Henderson	CR	1998
Glochidion	*comitum*	Shrub or small tree	Pitcairn	EN	1998
Glochidion	*pitcairnense*	Small tree	Henderson and Pitcairn	VU	1998
Hernandia	*stokesii*	Tree	Henderson	VU	1998
Homalium	*taypau*	Tapau (tree)	Pitcairn	VU	1998
Myrsine	*hosakae*	Small tree	Henderson	VU	1998
Nesoluma	*st.-johnianum*	Small tree	Henderson	VU	1998

Note: The Red List status for plants has not been updated since 1998. In addition, there are a number of other Pitcairn and Henderson endemic plants which still have their identifications (& hence names) to be agreed. They have yet to be assessed by the Red Data List. The status of *Abutilon pitcairnense* (Yellow fatu) (CR), *Bidens mathewsii* (Alihau) (VU) and *Angiopteris chauliodonta*[4] (Nehe fern) (CR) have not been officially validated yet by the Red List committee. Recent research on *Bidens mathewsii* (Alihau) undertaken in June 2014, showed that 1 plant was existing in the wild (J. Craw, pers. comm.). This argument could imply a review of its current threat status (VU)[5].

Table 4.3 List of UICN Red List of globally threatened birds present in the Pitcairn Islands (CR, EN and VU) (source: http://www.iucnredlist.org/ downloaded May 2015).

Genus	Species	Common names	Red List Status	Year assessed
Acrocephalus	*vaughani*	Pitcairn Reed-warbler	EN	2014
Acrocephalus	*taiti*	Henderson Reed-warbler	VU	2012
*Nesofregetta**	*fuliginosa**	Polynesian Storm-petrel	EN	2012
Pterodroma	*alba*	Phoenix Petrel	EN	2012
Pterodroma	*atrata*	Henderson Petrel	EN	2012
Numenius	*tahitiensis*	Bristle-thighed Curlew	VU	2012
*Pterodroma***	*brevipes***	Collared Petrel	VU	
*Pterodroma***	*cookii***	Cook's Petrel	VU	2012
*Pterodroma***	*externa***	Juan Fernandez Petrel	VU	2012
Ptilinopus	*insularis*	Henderson Fruit-dove, Henderson Island Fruit-Dove, Scarlet-capped Fruit Dove	VU	2012
Vini	*stepheni*	Henderson Lorikeet, Stephen's Lory	VU	2013
Porzana	*atra*	Henderson Crake, Henderson Island Rail, Henderson Island Crake, Red-eyed Crake	VU	2012

(*) Not known to breed in the Pitcairn Islands
(**) Does not breed in the Pitcairn Islands

[4] See Kingston, N, Waldren, S. & Smyth, N. 2004. Conservation genetics and ecology of *Angiopteris chauliodonta* Copel. (Marattiaceae), a critically endangered fern from Pitcairn Island, South Central Pacific Ocean. Biological Conservation, 117(3): 309-319.

[5] The individual *Bidens mathewsii* observed, was a single small plant despite being in a large area of ideal habitat (low regenerating native plant cover). This was due to its location on the top edge of a track bank, overhanging it, so that goats did not have access to the plant. A very fortuitous but precarious happenstance (J. Craw, pers. comm.).

Table 4.4 List of UICN Red List of globally threatened molluscs present in the Pitcairn Islands (CR, EN and VU) (source: http://www.iucnredlist.org/ downloaded May 2015).

Genus	Species	Red List Status
Diastole	*tenuistriata*	VU
Philonesia	*filiceti*	VU
Philonesia	*pitcairnensis*	VU
Sinployea	*pitcairnensis*	VU
Tubuaia	*fosbergi*	VU

Table 4.5 List of UICN Red List of globally threatened corals present in the Pitcairn Islands (CR, EN and VU) (source: http://www.iucnredlist.org/ downloaded May 2015).

Genus	Species	Red List Status	Year assessed	Population Trend
Acropora	*aculeus*	VU	2014	Decreasing
Acropora	*globiceps*	VU	2014	Decreasing
Acropora	*listeri*	VU	2014	Decreasing
Acropora	*lovelli*	VU	2014	Decreasing
Acropora	*retusa*	VU	2008	Decreasing
Astreopora	*moretonensis*	VU	2008	Decreasing
Montipora	*australiensis*	VU	2008	Decreasing
Montipora	*caliculata*	VU	2014	Decreasing
Montipora	*crassituberculata*	VU	2008	Decreasing
Montipora	*lobulata*	VU	2014	Decreasing

Table 4.6 List of UICN Red List of globally threatened fishes, echinoderms and marine mammals present in the Pitcairn Islands (CR, EN and VU) (source: http://www.iucnredlist.org/ downloaded May 2015).

Genus	Species	Common name	Red List Status	Year assessed	Population Trend
Carcharhinus	*longimanus*	Oceanic Whitetip Shark	VU	2006	Decreasing
Cheilinus	*undulatus*	Humphead Wrasse	EN	2004	Decreasing
Epinephelus	*lanceolatus*	Giant Grouper	VU	2006	Decreasing
Isurus	*oxyrinchus*	Shortfin Mako	VU	2009	Decreasing
Makaira	*nigricans*	Blue Marlin	VU	2011	Decreasing
Plectropomus	*laevis*	Black-saddled Coral Grouper	VU	2008	Decreasing
Rhincodon	*typus*	Whale Shark	VU	2005	Decreasing
Sphyrna	*mokarran*	Great Hammerhead Shark	EN	2007	Decreasing
Thunnus	*obesus*	Bigeye Tuna	VU	2011	Decreasing
Holothuria	*fuscogilva*[6]		VU	2013	Decreasing
Balaenoptera	*musculus*	Blue Whale	EN	2008	Increasing

Note: the Red List status of the Humpback whales at the time of writing is Least Concern (LC). Nevertheless, the status of the sub-population present at Pitcairn/Henderson (F2) is reckoned to be at higher risk by certain authors (Olavarria et al., 2007). Authors Irving and Dawson are still not certain as to whether the populations of humpbacks which occur at Pitcairn and at Henderson are part of this F2 sub-population or whether they may constitute their own F3 sub-population (R. Irving, personal comm. 2015).

[6] Conand, C., Purcell, S. & Gamboa, R. 2013. *Holothuria fuscogilva*. The IUCN Red List of Threatened Species 2013: e.T200715A2681354. . Downloaded on 11 September 2015

4.2 Sites

Henderson Island is a World Heritage site since 1998 on account of it being the world's only raised coral atoll with its ecology virtually intact. A management plan (2004-2009) for the island was prepared to ensure the conservation of this unique raised coral atoll and its associated biodiversity (Brooke, Hepburn & Trevelyan, 2004).

All four islands were designated as Important Bird Areas (IBAs) in 2010, with Henderson also being designated an Endemic Bird Area (EBA) and an Alliance for Zero Extinction (AZE) site.

In March 2015, the UK Chancellor of the Exchequer announced in his Budget to Parliament that the government intended to proceed with the designation of a Marine Protected Area (MPA) around Pitcairn. The decision is the first step in the process to create a fully protected marine reserve extending from 12 miles offshore from Pitcairn Island to the full extent of the Exclusive Economic Zone of the Territory's waters, encompassing over 830,000 square kilometres of ocean. The campaign to establish the MPA around the Pitcairn Islands began in 2010 when the Pew Charitable Trusts, through their Global Ocean Legacy programme, identified the islands as a candidate site within a system of large fully protected marine reserves on a global scale. With full support from the island community obtained in 2011, the Pew Trust commissioned the first of a number of scientific and economic reports relating to the characterization of Pitcairn's marine environment (Irving and Dawson, 2012) and the impact of a marine reserve on the local economy (Dickie et al., 2012). Further scientific evidence was collected through a National Geographic Pristine Seas Expedition, which undertook extensive diving surveys at all four islands (Sala et al. 2012; Friedlander et al., 2014).

The purpose of the Pitcairn Islands Marine Reserve is to protect the special marine environment, namely the abundant biodiversity, two of the most southern coral atolls in the world, and the deepest well developed tropical coral reef. The marine reserve aims also to provide a world-class, fully protected marine reserve to attract scientific research, non-consumptive tourism and other non-extractive economic uses, and favorable global recognition for Pitcairn. A management plan for the inshore waters of the MPA (extending to 12 nm offshore around Pitcairn Island and including the area known as 40-mile Reef), is currently under development as part of a Darwin-funded project. Enforcement within the MPA is a major consideration – a partnership between Pew and Satellite Applications Catapult has resulted in the 'Eyes on the Sea' project, using satellites to monitor illegal activity.

A review by the UK Overseas Territories Conservation Forum in 2005 (commissioned by UK Government and conducted in consultation with Pitcairn personnel) proposed the three islands of Henderson, Ducie and Oeno, as well as two areas on Pitcairn - its coastal waters (not defined) and an area known as Brown's Water - as Ramsar (Wetlands) sites but they are yet to be designated.

4.3 Key Biodiversity Areas

The Key Biodiversity Areas (KBA) defined hereunder are the areas that require a major conservation effort. In the case of the Pitcairn Islands, all four islands (Pitcairn, Henderson, Ducie and Oeno) have been selected as KBAs (see description of KBAs in chapter 10). The four KBAs were identified based on an analysis of available data and publications and following the consultation of a group of experts, public sector and civil society representatives who are involved in the Pitcairn Islands environment and conservation issues.

A questionnaire was sent to all parties to define the list of KBAs. Stakeholders were invited to note each zone based on three criteria:

- Biological significance of the site;
- Level of threat(s) on the site;
- Feasibility of setting up (or reinforcing existing) a conservation project management structure on the selected site.

Table 4.7: Criteria used to determine KBAs

Criteria					
Biological Importance		**Level of Threats**		**Feasibility of setting up a management structure**	
High	+++	High	+++	High	+++
Medium	++	Medium	++	Medium	++
Weak	+	Weak	+	Weak	+
Biological Importance Presence of : - Threatened species according to the IUCN Red List (CR, EN, VU) And/or - Endemic species					
Level of Threats Important and urgent threats are present on the site (Invasive species, habitat destruction by human activities, climate change ...)					
Site Management structure Feasibility of setting up or supporting an existing management structure on the site. This criterion takes account of the possibility to set up or support a local management structure for the conservation of the area to ensure its effective protection.					

5. SOCIOECONOMIC CONTEXT

5.1 Pitcairn Administration

(Source: Pitcairn Island SDP 2014-2018)

The Pitcairn Islands are a British Overseas Territory. The governance and institutional structure is set out in the Pitcairn Constitution Order 2010 (March 2010). The governance structure is broadly defined as follows: (i) administration is headed by the Governor (British High Commissioner to New Zealand) appointed by Her Majesty's Government (HMG); (ii) the Governor's Representative, who normally resides on the Island for 12 months; (iii) the Island Council is an elected body, consisting of the Mayor, Deputy Mayor, five Councillors, the Governor's Representative who sits on Council as an ex-officio member. The Governor and Deputy Governor are also ex-officio members; (iv) actual on-island operations are supervised by four Divisional Managers (Community Development, Environmental, Conservation & Natural Resources, Finance & Economics and Operations) who report to the Island Council; and (v) the Pitcairn Island Office (PIO), based in Auckland, provides administrative and financial support. Within this structure, the Island Council and the Divisional Managers exercise general day-to-day administration, with advice and support from HMG with whom Council works in partnership. PIO is responsible for administering the annual budgetary aid requirements in collaboration with the Island Council and HMG.

As part of the reform process, new policies and procedures were introduced in line with the principles of good governance (see: HMG White Paper of 1999) and the allocation of increased responsibilities to the Island Council. The new Constitution also incorporates: (i) issues related to human rights based on the European Convention on Human Rights; (ii) new role of an Attorney General; and (iii) right of appeal to an Ombudsman. As part of this process, the existing Ordinances are being reviewed and amended to comply with the new constitution. The Governor is responsible for drafting new laws and ordinances in consultation with the Island Council, which has the subsidiary responsibility for enacting appropriate bye-laws.

The four management divisions of the GPI are responsible for the day-to day operations of the Island Government. Each division manages its own budget, once approved by the Council. The divisions report monthly to the Island Council who are responsible for supervising divisional performance on behalf of the Island Council.

Environmental issues are dealt with by the Environmental, Conservation & Natural Resources Division. This division comprised 10 part-time staff in 2012, and is responsible for: reservation and conservation of the natural environment; biosecurity; natural resource management (e.g. land, water, fisheries, etc.); plant nursery; promotion of local agricultural production and export (e.g. honey production); eco-trail maintenance; land court and surveyors (including land tax administration); environmental supervision of the other islands; liaison with international environmental organisations (e.g. RSPB, the Pew Charitable Trusts and other Non-Governmental Organisations); liaison with PIO and DFID.

5.2 Pitcairn policy framework

Pitcairn has an Environmental Charter that was signed with the UK Government in 2001. The new Overseas Territories Strategy White Paper "The Overseas Territories: Security, Success and Sustainability" published in June 2012, is based on the principles of self- determination, mutual responsibilities and autonomy with a pledge of UK help when needed. In this context, the Pitcairn Government has prioritized: the mitigating of isolation and risks through improved shipping and transport infrastructure; the economic growth and self-sufficiency; the promotion of tourism, good governance and a safe and secure environment.

The Strategic Development Plan (SDP) (2012-2016) identified the conservation and protection of the natural environment of the Pitcairn Islands as a main objective which comprises: the update of an Environmental Action Plan with support of OTEP (Overseas Territories Environment Programme); the support of environmental projects with international agencies and NGOs; and the environmental safeguard of Henderson Island as a World Heritage Site. The recently updated Strategic Development Plan (2014-2018) acknowledges that environmental management and protection for future generations is becoming increasingly important. As well as impact assessments (EIA) on all road and construction projects, increasing efforts will be concentrated into areas like combating soil erosion, water and waste management, management of endemic plants and birds on all four Islands, combating climate change issues, protecting marine and islands ecosystems and investigating options for renewable energy.

More in general, the SDP 2014-2018 concentrates on four recognised key areas:

- Repopulation;
- Economic Development;
- Environmental Management and;
- Infrastructure Development to support the three main pillars;
- The plan also includes future economic development and possible funding opportunities under EDF 11.

The Repopulation Infrastructure Plan (2014-2018, currently under review) aims to attract and retain new migrants to Pitcairn. It is accepted that migrants will now need to come from outside the Pitcairn Diaspora, attracted by a better life, and that once they are here, provisions must be in place for their care including the challenge of finding them employment. The EU funded EDF projects provide an ideal opportunity to create a platform for this (SDP, 2014-2018).

The objective of the Tourism Strategic Plan (2011-2015), with a budget of € 5 million, is to develop tourism as the territory's main industry and thus to create an industry that will contribute to reducing the territory's financial dependence on budgetary aid. This objective is to be achieved by increasing the numbers of visitors, including overnight guests, of daily passengers from cruise ships landed, and of private yachts coming to Pitcairn.

The most important environmental strategies are the guidelines and strategies set out in the Pitcairn Islands Environment Management Plan (Smyth 2008) and Henderson Island Management Plan (2004-2009) (Brooke, Hepburn & Trevelyan, 2004). Both documents are currently under review.

The Henderson plan seeks to:

- Create an administrative structure to ensure implementation;
- Tackle the threat of alien fauna and flora;
- Prevent the removal of biological, geological and Polynesian archaeological material;
- Control tourism and associated visitor impact, excluding visitors from the plateau and ensure that it is sustainable, non-damaging and contributes revenues to the Pitcairn economy;
- Prevent reef damage;
- Reduce the exploitation of miro and toa timber to sustainable levels - management should therefore be designed to foster sustainable use of Henderson's woods;
- Ensure continued monitoring and research.

Species Action Plans are lacking, though capacity is a major challenge (the Pitcairn Environmental, Conservation & Natural Resources Division is manned only by part-time staff).

Since the Pitcairn Islands Environmental Management Plan (PEMP) developed in 2008 is now out of date, the Government of Pitcairn Islands is now working on a longer term sustainability plan for all islands to 2030. Following this, a management structure or the setting up of an entity to coordinate all research, conservation management and sustainable development to help with implementation of the Plan to provide support to Pitcairn Islands could be set up.

5.3 Pitcairn legal framework

Pitcairn participates in the following Multilateral Environmental Agreements (MEAs)[7]:

Table 5.1: Participation of Pitcairn in the following Multilateral Environmental Agreements

MEA	Extended	Effective	Comments
Convention on Biological Diversity (CBD)			Signed - not yet extended.
Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES)	August 1976	October 1976	
Bonn Convention on the Conservation of Migratory Species of Wild Animals	July 1985	October 1985	Signed - not yet extended. Pitcairn government sees the extension of the agreement on the conservation of Albatrosses and Petrels (ACAP) (19/6/2004) and of Indian Ocean Turtle Memorandum of Understanding (IOT MoU) as very useful.
London Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter	November 1975	December 1975	
Convention on Wetlands of International Importance (Ramsar)	January 1976	May 1976	No sites yet listed; but 2 sites on Pitcairn Island (Bowns Water and Costal Water) and the other 3 islands (Ducie, Henderson and Oeno) have been proposed.

[7] European Commission (2015), EU OCT Environmental profiles

MEA	Extended	Effective	Comments
Convention concerning the Protection of the World Cultural and Natural Heritage (World Heritage)			Henderson Island was designated in 1988 as a World Heritage Site by UNESCO for meeting the following criteria: - containing superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance. - containing the most important and significant natural habitats for *in-situ* conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.
Convention for the Protection of the Natural Resources and Environment of the South Pacific Region (SPREP)	July 1987	Not yet	Signed in respect of Pitcairn, Henderson, Ducie and Oeno Islands (Ratification has not taken place)

The following legal instruments have been adopted[8]:

Table 5.2: Legal instruments adopted

Legal Instrument	Remarks
Local Government Ordinance (2012)	Establishes the basis for the Environmental Impact Assessment (EIA) policy. Consent from the Council is required for any development.
Freedom of Information Ordinance (2012)	Includes a right to appeal any decision made not to publish information and which will enable more open and transparent Government. Subject to certain exemptions, the Ordinance gives any person the right to request information from a public authority.
Apiaries Ordinance	Beekeeping regulations, including disease prevention and importation
Endangered Species Protection Ordinance (2004)	Largely designed to implement CITES. It provides for the declaration of "endemic management zones" with special habitats protection measures. No terrestrial or marine endemic management zones have been declared to date. Henderson Island has a Management Plan (2004-2009), published 2004 by the FCO in conjunction with the Pitcairn Islands Administration and the RSPB, which has expired and requires update.
Fisheries Zone Ordinance (2001)	Provides the legislative basis for fisheries management. The ordinance establishes and regulates fishing within Pitcairn's EEZ, and provides for the issue of licences.
Prevention of Collisions at Sea Ordinance (2001)	Implements the International Regulations for Preventing Collisions at Sea, 1972 (as amended by a resolution of the Inter-Governmental Maritime Consultative Organisation of 19th November, 1981).
Land Tenure Reform	Elaboration of a land register. Definition of what happens to land when its Land Allocation Title holder departs from the island for an indefinite period. Includes housing land, garden land and orchard and forest land.
New Immigration Control Ordinance 2006	Restrictions on visitors and restriction on certain vessels carry fare-paying passengers.
Local Government Regulations - Part III and IV	This covers animals and wildlife. Part III incorporates provisions for implementing CITES and Part IV the Bonn Convention. Section C deals specifically with wildlife

[8] European Commission (2015), EU OCT Environmental profiles

Legal Instrument	Remarks
(1971)	and is concerned primarily with species protection. The legislation generally prohibits the killing or taking of eggs of wild birds and, subject to the authority of the Wild Bird Protection Committee, controls the extent to which certain prescribed species may be exploited. An amendment in 1982 protects species (three whales, three seabirds and two sea turtles) restricting their capture, killing or harassment, and protects migratory species. There are no permits or quotas, but fines can be imposed for breaches of the regulations.
Local Government Regulations	Section 7 Part I,II,III,IV,V,VI,VIII & XI
Local Government Regulations, other parts	Rules covering such issues as rubbish disposal, digging of cesspits. There are no permits or quotas, but fines can be imposed for breaches.

Access to the islands requires a licence issued by the Governor in consultation with the Island Council.

6. LEGAL AND POLITICAL CONTEXT

Between 2012 and 2014, Pitcairn's permanent resident population diminished from 52 to 51 (SDP, 2014-2018). In 2012, the Island was also populated by 10 non-residents (Governor's representative, doctor, teacher, police officer, FCA (Family and Community Advisor) and their partners, who were generally on one-year contracts. The 2012 resident population was distributed as follows: (i) 50% male and 50% female; (ii) age distribution: 19% under 20 years of age, 61% 21 to 65 years, 20% over 66 years. The labour force consisted of 31 able-bodied persons (17 males and 14 females between the ages of 20 and 65 years) (SDP, 2012-2016).

A medical centre staffed by a seconded GP and a local resident Enrolled Nurse provide day to day care for the community. A relationship with French Polynesia allows residents needing secondary medical treatment to attend hospital in Tahiti as required.

Education continues to be provided at the Pitcairn Island School where the New Zealand curriculum is taught from preschool up the age of 12 years. There after education is provided via correspondence school and by attending secondary school in New Zealand by HMG.

Social services are provided to the community as required. Family allowances are provided to all children under 18 years of age and a pension to all citizens over 65 years of age. An elderly care service to provide additional support to senior citizens has recently been introduced. The government is aware that with an increasing aging population, further support will be required.

Employment on the island is divided between the Government sector (many part-time jobs) and private individual and family activities. In 2012 there were 82 paid Government posts (e.g. Island Councillors, division managers, administrative functions, technicians and general operatives), and most of those employed held one or more positions.

All land is owned by the government of the Pitcairn Islands and allocated and leased to the Island community.

Despite its remote location and small size, Pitcairn has a shipping service for cargo and passengers (MV Claymore II with 12 passenger berths) that is subsidised by the UK Government. The current shipping contract provides annual services for: (i) 4 cargo voyages to and from New Zealand; and (ii) 8 passenger services to and from Mangareva, one of the southernmost islands of French Polynesia which has regular air flights to and/from Tahiti and beyond.

On Pitcairn there is a school, a health centre, a police station, a post office, a public hall, a church, the Government Treasury (a banking facility), a library and a general store. The entire population is entitled to school education.

The island has a small economy that is very dependent on annual budgetary aid (current and capital expenditure) from the UK Government in order to maintain a reasonable and secure lifestyle that covers: (i) on-island operations; (ii) expatriate professionals on island; (iii) Pitcairn Island Office (PIO in Auckland, NZ); and (iv) a subsidised shipping service. The recent SDP (2014-2018) seeks to achieve a greater level of income from tourism and small scale exports to increase Gross Domestic Product, offset budgetary aid and provide a better standard of living for the community.

About 50% of the cost of budgetary aid is payment for shipping services. The payment to non-residents, who are medical health staff, teachers, police, etc. and the cost of the Pitcairn Island Office in Auckland and a number of subsidies are also important (SDP, 2014-2018).

Pitcairn has a mixed economy that consists of:

- Public sector - employs most of the able-bodied Islanders on a part-time basis to undertake a wide range of administrative, construction, operation and maintenance functions that impact all aspects of daily life (e.g. electricity generation, telecommunications, management and administration, social and child welfare, health, education, policing, environmental conservation, island store operations, biosecurity, and a wide range of general maintenance tasks, etc.). The active Islanders are employed in part-time positions. All positions receive a small monthly salary that is paid by the annual budgetary aid programme;
- Private sector – consists of individual and family activities in the form of: carving of wooden handicrafts, fishing, beekeeping and honey production, fruit and vegetable cultivation, home-stay tourism, general maintenance, some animal husbandry, etc.

The Island also generates small volumes of international trade, as follows:

Exports (goods and services)

- Public sector: (i) postage stamps, coins, and domain internet names that are managed by private NZ contractors administered by the PIO; and (ii) cruise ship passenger landings on Pitcairn;
- Private sector: of sales of souvenirs sold to cruise ship passengers and tourist, honey production for export, fishing, agriculture, tourism, etc.;
- Development of Trade relations with Mangareva.

Imports

- Public sector: diesel fuel, building materials, spare parts, some machinery and foodstuffs for the Island Store;
- Private sector: limited individual orders, all foodstuffs are now channelled through the Island Store.

Goods have to be trans-shipped into longboats at sea from larger ships (primarily the MV Claymore II), typically within 6ft x 6ft containers, taken ashore and transported uphill to Adamstown by quad bike/tractor from Bounty Bay.

Tourism is now GPI's biggest income source. It is hoped to continue to develop Pitcairn as a unique tourist destination for the benefit of both the public and private sector (SDP, 2014-2018).

In terms of its finances, Pitcairn has been dependent on annual budgetary aid since 2003 following the decline in the international stamp market (previously the Island's main source of income) in the 1990s and the depletion of its reserve fund in 2002.

Pitcairn's soils are volcanic and fertile. Both tropical and temperate fruits and vegetables are cultivated, such as citrus, sugarcane, watermelons, bananas, yams, and beans, mostly for local consumption. Mangoes, pawpaws, coconuts, tomatoes, eggplant also widely cultivated.

Fish are relatively abundant in the seas around the islands at least for local consumption. Spiny lobsters and a large variety of fish are caught for meals and for trading aboard passing

ships. Fish such as nanwe, white fish, moi and opapa are caught in shallow water, while snapper, big eye and cod are caught in deep water and yellow tail and wahoo are caught by trolling. (Eco)tourism in Pitcairn has economic potential, though access to the Territory would need to be improved.

7. CURRENT STATUS OF THE CONSERVATION COMMUNITY

This part aims to describe all conservation organizations and their activities that have been active in Pitcairn over the last two decades (or more, whatever data is available).

Secretariat of the Pacific Community (SPC)

Pitcairn Islanders are experiencing longer, more severe periods of drought and variability in rainfall. The EU is funding collaboration between the Secretariat of the Pacific Community (SPC) and Pitcairn to monitor the weather on Pitcairn, and using this information to bolster the island's water-storing capacity. The SPC has provided a grant of € 300,000 to improve access to water for Pitcairn Islanders with a view to reducing water-related health risks and increasing conservation of water. The SPC also provides technical and administrative advice and support, on biosecurity[9] (including export and import compliance issues, assessment of risks in importation of live chickens for local egg production, capacity building and infrastructure support for biosecurity staff), trade and fishing issues (including a framework for domestic fisheries development).

Project INTEGRE

INTEGRE is the regional project for the Pacific OCTs funded under 10th EDF (regional funds) by the European Union and implemented by the Secretariat of the Pacific Community (SPC). In the framework of this project, each territory will implement a certain number of pilot projects. On Pitcairn, the project will seek to improve waste management practices, to combat soil erosion and to develop marine and fisheries legislation, sustainable fisheries and ecosystem management and create marine based ecotourism. Pitcairn is also part of the project “Supporting disaster risk reduction in Pacific overseas countries and territories”.

Royal Society for the Protection of Birds (RSPB)

The Royal Society for the Protection of Birds (RSPB) is a UK charity which works to conserve not only birds but all forms of wildlife, both in the UK and worldwide. It is a large Non-Government Organisation (NGO) with over one million members. In 2011 the RSPB, in partnership with the Pitcairn Island’s Natural Resources Division (NRD) and other partners, undertook a rat eradication operation on Henderson Island, at a cost of £1.4 million. Unfortunately subsequent visits to the island in 2012 established that this eradication attempt had failed. The RSPB intends to undertake another eradication attempt in the near future, but not before further studies have been carried out to determine why the attempt failed (see below). The Pacific rat was successfully eradicated from both Oeno and Ducie Islands in 1997.

The Darwin Initiative

The Darwin Initiative is a UK government grant scheme that helps to protect biodiversity and the natural environment through locally based projects worldwide. The Darwin Initiative has funded several projects in the Pitcairn Islands. Note that in 2013, a separate grant scheme entitled InitiaPlust was established, solely for projects being undertaken with the UK’s Overseas Territories. From 2010 to present, the Pitcairn Islands have benefitted from two Darwin Initiative projects, with funding totalling £561,998. One project (run jointly by RSPB

[9] http://www.spc.int/lrd/focus-areas/biosecurity-and-trade/23/padil

and Pitcairn's NRD, with funding of £287,060) aims to maintain, monitor and advance solutions to Invasive Alien Species (most notably the Pacific rat) for the Pitcairn Islands, particularly with reference to protecting endemic rare birds, whilst sharing experiences, capacity and best practice with other Pacific countries and territories (implementation period 2012-2016).

A second (current) project funded by the Darwin Initiative is entitled *A sustainable marine and fisheries management plan for the Pitcairn Islands* and runs from 2013-2017 (project value is £250,000). It is jointly led by the University of Dundee, the Zoological Society of London and Sea-Scope Marine Environmental Consultants. The project supports the Pitcairn Government to make informed decisions leading to sustainable use of their marine resources by (1) underpinning the scientific evidence-base, (2) developing local capacity to undertake fisheries and environmental assessments, (3) developing a marine management plan with the Pitcairn community and UK Government for fisheries and the proposed marine reserve, (4) enhancing tourism opportunities, and (5) increasing public awareness of Pitcairn's importance in meeting the UK's biodiversity targets. This project will produce a fully-operational fisheries and marine management plan that is ecosystem-based and sustainable, which is crucial to providing a secure future for the economic benefit of the Island community and protection of the unique marine biodiversity of the Pitcairn Islands. The project will also support the community in enhancing tourism opportunities, the overall visitor experience on Pitcairn and also to increase awareness and interest in Pitcairn.

Blue Ventures

Blue Ventures is a British conservation and volunteer tourism organisation that organises marine conservation expeditions in which volunteers from around the world can participate to support conservation projects, working closely with field research teams and in partnership with local communities. Blue Ventures expeditions combine conservation research, education and adventure travel to give volunteers high quality and productive conservation tourism experiences that benefit host communities and support pioneering conservation programmes through sustainable funding and manpower.

Based on a visit to Pitcairn Island in May 2014 by Blue Ventures' Managing Director, which included meetings and discussions on the Island, the organisation has identified two volunteer tourism options, a short or long stay on the Island. According to the organisation, these opportunities could generate revenue and support development on the Island, and introduce potential immigrants to Pitcairn. Blue Ventures is currently willing to work with the Island Council to develop a volunteer tourism product, supporting the Pitcairn community in the establishment, marketing and management of a nascent volunteer tourism sector for the Island.

8. THREATS AND PRESSURES ON BIODIVERSITY

The main threats affecting Pitcairn Islands' (and Pitcairn Island in particular) biodiversity are posed by habitat clearance, spread of invasive species, small species' population sizes or restricted distributions and erosion.

Clearance of native forest

Clearance for agriculture, gardens, roadways, firewood and plantations of exotic species has extensively occurred in Pitcairn in the past. This has caused a massive reduction in the habitat available to native species, thereby reducing their distributions, population numbers and population sizes.

Spread of invasive species

A large number of species (ca. 250) have been introduced to Pitcairn, both accidentally and intentionally, 10 of which are considered as problem taxa. Some have become widespread and troublesome, and include both animals (e.g., goats, cats, rats, mice, wasps, ants and fruit flies) and plants (e.g. *Lantana camara, Sorghum sudanense*). The pace of introductions, both accidental and intentional, has not decreased in recent years despite a growing awareness of the problems caused by introduced species. The threats to the native biodiversity are mainly due to widespread alien species (e.g*., L. camara, Canna indica*) and to the poorly dispersed species (e.g., *Crinum asiaticum, Carpobrotus edulis, and Leucaena leucocephala*) which are not considered by Pitcairners to be a problem. The Islanders are more concerned with more typical agricultural weeds (e.g., *Bidens pilosa, Euphorbia peplus*) and the spread of *Syzygium jambos*. The invasive rose-apple *Syzygium jambos*, introduced as a source of fuelwood to the island, is now outcompeting the native forest species *Meterosideros collina* and *Homalium taypau* through the centre of the island. *Syzygium jambos* forms monospecific stands which contain few or no native species. Where these stands occur on steep slopes, the lack of ground flora combined with goat browse results in soil erosion. There is some evidence that the spread of *S. jambos* also threatens the island's endemic land snails (Kingston and Waldren, 2003 and 2005). The rose-apple is being eradicated in places to allow the original vegetation to come back. The National Botanic Gardens of Ireland have been involved in the study and invasive species eradication actions since 2003[10]. On Henderson, hardwoods (miro and toa) used for handicrafts is a threat (European Commission, 2015).

Feral goats have seriously affected the local coastal habitat where there is evidence of grazing of the Pandanus tectorius coastal forest (Christian M., 2011). A wild goat eradication/management project was undertaken during June 2014. This was successful in that all goats were culled from the wild. However, a small number of goats are still kept as family pets and/or as a food supply and some residents are attempting to farm goats behind netting fences. Goats have recently been recorded in the wild again. So the threat to endangered native plants has lessened but is likely to increase sharply over the next 1-3 years (J. Craw, pers. comm. 2015). A successful campaign in 1997 eradicated the Pacific rat from the two low-lying atolls of Oeno and Ducie, while on Henderson globally important seabird populations (petrels) are still threatened by this species (European Commission, 2015). A rat eradication programme on Henderson, undertaken by the RSPB in 2011, was

[10] http://www.botanicgardens.ie/herb/pitcairn.htm

unsuccessful and further scientific research aimed at determining why the programme failed is being undertaken by RSPB in 2015 and funded by the Packard foundation.

Very small population sizes

Several plant taxa have critically low population sizes on Pitcairn itself. *Diplazium harpeodes* is an example of a species widely distributed in the native forest, but which has consistently small populations. Some species have naturally small population sizes, and some may be recent colonisers on Pitcairn (e.g., coastal taxa such as *Ipomoea littoralis*), but others have almost certainly become reduced in recent years due to habitat clearance and goat browse (e.g. *Coprosma benefica*, now restricted to 12-15 individuals; *Bidens mathewsii,* only 1 plant currently known in the wild (J. Craw, pers. comm.); *Angiopteris chauliodonta*) (Kingston and Waldren, 2005) (J. Craw, pers. comm., 2015).

Highly restricted distribution

Most plant taxa have highly restricted distributions on Pitcairn; for example the only population of *Lastreopsis pacifica* occurs in an area of just 20 m by 60 m. Species with restricted distributions may or may not have small population sizes. *Lycopodiella cernua* is an example of a species which occurs in only a small area, but whose population is estimated at over 1000 individuals. The restricted distribution is in most cases due to reduced habitat availability caused by forest clearance and invasive species (Kingston and Waldren, 2005).

Erosion

Forest clearance leads to soil erosion, particularly if the ground flora is removed or damaged.

Goat grazing and trampling has led to erosion on exposed ridges and slopes. While some erosion is inevitable on high islands due to climatic effects and landslides, it is clear that the current excessive erosion threatens the native plant species and communities (Kingston and Waldren, 2005). One of the objectives of the ongoing INTEGRE project (see chapter 7) is addressing erosion.

Absence of a frugivorous bird

Pitcairn's native flora would be significantly enhanced by the presence of a frugivorous bird. About 31 species – among which some of the most threatened species including the endemic species from Pitcairn Island *Myrsine aff. niauensis, C. benefica and Glochidion comitum* - are dispersed by means of birds. Several other native species are being threatened on the island by the lack of a bird disperser, including *Celtis pacifica, Cocculus ferrandianus, Xylosma suaveolens, Psydrax odoratum and Cyclophyllum barbatum* (Kingston and Waldren, 2005).

Exploitation

Several plant species are collected as timber for house and road building, for carvings, domestic use, or for ornamentation. Examples are *Cyathea medullaris*, a tree fern whose stems are used for carving inlays; *Psydrax odorata* and *C. barbatum*, which are collected annually as Christmas trees; and *Jasminum didymum* which is collected from the wild for flowers or for transplanting to gardens (Kingston and Waldren, 2005).

Other pressing issues identified include: dry periods; the percentage of land lower than 50 m above sea level and the reduced land area in a fragmented country; the distance to the closest continent; the number of known species that migrate outside the territorial area at any time during their life spans (including land and many aquatic species) / area of land; the number of endangered and vulnerable species per 1000 km^2 land area (IUCN definitions) (European Commission, 2015).

The marine environment

An overall assessment of the threats specifically concerning the marine environment of the Pitcairn Islands is still lacking, however illegal fishing, particularly if this occurred around any of the islands or seamounts, could damage Pitcairn's fish populations and disturb its near pristine marine environment. The current Darwin-funded project which aims to produce a sustainable marine and fisheries management plan for the islands should cover these issues.

Marine litter

Water-borne litter is becoming a very serious threat to many marine animals. The Pitcairn Islands lie within the Eastern South Pacific Gyre, an ocean movement that carries with it vast amounts of plastics and other non-degradable floating debris. Recent research at Henderson has shown levels of beach litter to have increased dramatically over the past two decades (J. Lavers, pers. comm., 2015).

New threats resulting from climate change

There are no specific scientific data on the impacts of climate change on the biodiversity of the Pitcairn Islands. However, it is possible to hypothesize that the corals within the lagoons of Oeno and Ducie will, in all likelihood, be adversely affected by rising sea temperatures and the resulting bleaching episodes. A rise in sea levels could also affect the coastal areas of these coral islands and indirectly threaten their bird and turtle populations (Petit & Prudent, 2010). However, because Pitcairn's coral reefs occur at the southernmost limits of coral distribution in the Southern Hemisphere, they are likely to be less impacted by warming events than corals closer to the equator. This is an important point, because it emphasizes why in particular these reefs can be important for the future.

Addressing these threats through the creation of nature reserves, species-specific recovery plans and control of invasive species, erosion and exploitation, could contribute to combat these problems. However, any conservation activities must be implemented in conjunction with the interests of the local community, and in consultation with them, in order to be successful.

9. ASSESSMENT OF CURRENT INVESTMENTS

As stated in the Pitcairn Strategic Development Plan (2014-2018), the main sources of funding and support for Pitcairn derive from:

Government source of funding and support:

- HMG;
- European Union (EU);
- Secretariat of the Pacific Community (SPC);
- Income derived from the island and traditional sources.

Non-Government source of funding and support:

- Royal Society for the Protection of Birds (RSPB);
- Darwin Initiative;
- PEW;
- Joint Nature Conservation Committee (JNCC).

The UK Government and DFID

The UK Government (DFID) has provided bilateral aid to Pitcairn since 2002/03. In 2010/11 it amounted to £ 2.4 million and in 2012/13 to £ 2.9 million (NZ$ 5,864,740) to meet the reasonable needs of the Islanders. DFID have provided money in the 2012/13 budget to cover the cost of repairs following storm damage and has awarded £43,000 to support the Tourism Marketing Action Plan.

The UK Government may also make available additional funding, through the Governor and the Jubilee Programme, for special projects.

The Overseas Territories Environment Programme (OTEP), was the joint programme of the Foreign and Commonwealth Office and the Department for International Development to support the implementation of the Environment Charters and environmental management more generally in the UK Overseas Territories. It funded 10 projects[11], all completed now, on different conservation topics: reforestation, vegetation and plant conservation, experimental removal of invasive species (e.g. Rose Apple), ecological restoration…

European Union: 9th, 10th and 11th EDF

Pitcairn has been allocated over 7 million euros for its Territorial EDF 9, 10 and 11. This has been approved for Tourism Sector development for the necessary infrastructure to assist the island to achieve its economic strategic goals and reduce its reliance on budgetary aid.

The 2.35 million euro 9th European Development Fund (EDF) has been used to construct an alternative harbour that has been assessed as being essential for economic development as it will help increase tourists landing and staying on the island.

The 2.4 million euro 10th European Development Fund (EDF) will be used to reinforce the infrastructure programme carried out under the 9th European Development Fund to support the development of the tourism sector (including upgrading of public buildings) thus assisting in creating alternative and viable sources of income for Pitcairn.

[11] You can find past project at http://www.ukotcf.org/infoDB/infoDBnewForm.cfm?appln=projects by entering "Pitcairn" in territory

The expected results of the 10th EDF programme are as follows:

- Improving ship-to-shore transfer reliability by providing a dedicated tender vessel, designed to transfer up to 70 passengers safely to shore;
- Improving transfer and sightseeing arrangements by providing tractor-trailer (or a 4-wheel drive truck) transit to passengers once they reach shore. This will be for scenic tours of the island as well as to the main centre of habitation;
- Enhancing the current public buildings visited by tourists, including the hall, which will be redeveloped, the post office (much visited by tourists to purchase Pitcairn's unique postage stamps), and the foreign exchange bureau. These buildings will be modernised in a manner that reflects Pitcairn's unique heritage and culture;
- Attracting additional yachts and encouraging longer stay, by providing facilities for yacht visitors, mooring points and maintenance facilities.

The 11th EDF – currently in the design phase - , builds further on the tourism sector as it is the sector most likely to create private sector employment for Pitcairn Islanders and provide opportunities to attract immigrants that are required for social sustainability. The expected results are as follows:

- Continue the development of the first greeting and distribution point for visitors to Pitcairn including reinforcing and armouring banks to decrease erosion and improve safety for tenders landing. Work to continue on from EDF10 around infrastructure supporting the new passenger vessels and people transporters;
- Upgrade Telecommunications on Pitcairn for both domestic and international communications. Greater services will assist in Pitcairn's marketing and tourism strategies and promotion of private sector development;
- Upgrade Pitcairn's Medical Centre, safety and rescue equipment on Pitcairn both land and marine response capabilities to address the demands from increased tourist numbers;
- Further develop Museums and develop a Pitcairn's Arts & Culture Centre to provide more tourist activities on Pitcairn and help preserve Pitcairn's unique culture including the ecological walkways and access to historic/scenic sites.

Finance for the environment

There are no regular budgets for the environment, though project funds can be sought from the UK for specific initiatives.

The Pitcairn Islands Group Strategic Development Plan (SDP) foresees a total of NZ$ 5,000 for environmental protection and conservation to be allocated to environmental awareness since the other activities are to be supported by the involved institutions and specific projects (the Pew Charitable Trusts, with regard to the establishment of the marine reserve; RSPB/OTEP/DFID/SPC regarding the safeguarding of Henderson Island as World Heritage Site; RSPB/DFID/FCO regarding the eradication of rats; and the Darwin Initiative regarding a marine management plan). These funds will be used for the development of promotional material on Pitcairn's natural environment which will include production of brochures and development of website to illustrate and to promote the flora and fauna for eco-tourism and scientific interest.

When the marine reserve is established, Pitcairn aims to generate revenue in the form of permit fees and other maintenance fees. This is common practice amongst marine reserves

and national parks throughout the world, and indeed tourists expect to pay a premium to access such sites and are prepared to do so (European Commission, 2015).

Other projects

Several scientific expeditions have taken place on the Pitcairn Islands, among them the Trinity College, Dublin, botanical expedition in 1997 and the Sir Peter Scott Commemorative Expedition in 1991-2, which documented the flora and vegetation of Pitcairn Island (Henderson was also visited but for a shorter period). A previous expedition, held in 1991, had already focused on Henderson Island only. More recently the Pew Charitable Trusts, the National Geographic Society and the community of Pitcairn Island organised expeditions (2012) which found species never reported before from the waters surrounding all four of the Pitcairn Islands, including algae, corals, reef fishes, and some deep-sea sharks.

The Pitcairn Island Government has also undertaken a number of internally and externally funded environmental projects over the last five years, including the roseapple clearance project, a goat eradication/management project and the Abutilon pitcairnense recovery project, carried out in partnership with the National Botanic Gardens of Dublin. A successful campaign has eradicated rodents from the two low-lying atolls of Oeno and Ducie.

Communication and awareness raising

Continued development of promotional material on the Territory's natural environment is identified in the Strategic Development Plan 2012-2016. This would be for scientific and eco-tourism interest. Additionally there is a range of educational material produced by UKOTCF and other collaborators relating to the heritage and natural environment of the Territory, including a Virtual Tour[12]. A series of natural history documentaries featuring the Territory are currently nearing completion by Stewart McPherson, which will be freely available to the Territory, and others, to distribute. In 2011 the RSPB developed two bird pins, the Pitcairn Reed Warbler and the Henderson Fruit Dove, which are sold to generate income for Pitcairn conservation.

[12] on www.ukotcf.org

10. PRIORITY AREAS FOR ACTION

The first step in identifying BEST investment priorities was the identification of conservation objectives at the level of species and sites (see chapter 3), with a list of target species highly threatened (according to the IUCN Red List) and remarkable sites (Key Biodiversity Areas, KBAs).

This chapter aims to present the priority areas and actions identified for future conservation investments in the Pitcairn Islands in the framework of the BEST programme but also for the implementation of other future conservation programs.

The thematic areas and actions identified as a priority for BEST investments have been established based on consultations with stakeholders.

Overall, the BEST investment priorities in terms of sites (KBAs) and themes are strictly related. The themes and actions can interest one or more KBAs according to the ecological, social and economic specificities of each site.

10.1 Priority KBAs

The Key Biodiversity Areas (KBA) defined hereunder are the areas that require a major conservation effort. In the case of the Pitcairn Islands, all four islands (Pitcairn, Henderson, Ducie and Oeno) have been selected as KBAs. The four KBAs were identified based on an analysis of available data and publications and following the consultation of a group of experts, public sector and civil society representatives who are involved in the Pitcairn Islands environment and conservation issues (details on chapter 4.3).

10.1.1 KBA Pitcairn (terrestrial and marine environments)

Image 10.1 Pitcairn Island (© Google Earth)

Name of KBA	Pitcairn Island
Description and status	Small, isolated rocky island, being the emergent tip of a volcano. Pitcairn is the only one of the 4 islands to be permanently inhabited, although with a very small (~50 persons) population. Access is by ship/yacht only. A regular (if infrequent) sailing takes place between Mangareva and Pitcairn. Important Bird Area (2010) Proposed Ramsar site (2005) - 'Coastal Waters' & 'Brown's Water' Due to become part of the Pitcairn Islands Marine Protected Area (MPA)
Criteria	**Details**
Biological importance	80 species of native vascular plants of which 10 (2 ferns and 8 angiosperms) are endemic *(e.g. Angiopteris pitcairnensis, Abutilon pitcairnense)*. At least 8 of 26 species of land snail are endemic. Only nesting locality of the globally vulnerable Pitcairn warbler. Endemic fishes, among which are: Pitcairn sandlance *Ammodytoides leptus*; Pitcairn many-spined butterflyfish *Hemitaurichthys multispinosus* and a species of combtooth blenny *Alticus* sp. The island's waters have recently (since the early 1990s) become a regular haunt (and likely calving area) of small numbers of humpback whales during the austral

Name of KBA	Pitcairn Island
	winter. Note that “the [waters surrounding the] islands remain one of the most pristine marine environments in the world.” (Dawson, 2015).
Threats	Invasive species (particularly Roseapple woodland & *Lantana*), hazardous waste, soil erosion, wild goats; man-made tracks; construction of houses & outbuildings; spread of exotics out of gardens; Pacific rat; feral and domestic cats. Some residents’ attitudes to conservation and pest control measures are also an issue (in particular concerning the attempts to control and eradicate feral goats). Over-fishing of apex predatory fish (e.g. shark species); over-fishing of spiny lobsters & rock lobsters.
Management	The Island is inhabited and is the easiest to access (regular sailing between Mangareva and Pitcairn is in place). External NGOs and organisations regularly visit the island and put in place projects or programmes. The main obstacle is lack of human resources and expertise due to low population and both financial and human resources, so additional mechanisms for conservation management are required. Some residents’ attitudes to conservation and conservation measures are also an issue.

10.1.2 KBA Henderson (terrestrial and marine environments)

Image 10.2: Henderson Island (© Google Earth)

Name of KBA	Henderson Island
Description and status	One of the least disturbed raised coral atolls in the world, with its terrestrial ecosystems largely intact. Uninhabited atoll. In the past, occasional 2–3 day visits by Pitcairners to harvest miro wood for carving, but this has not happened for a while. Rare visits by cruise ships (e.g. *World Discoverer*), who's passengers land for 2–3 hours on North Beach. Permission to land required from Pitcairn Government. World Heritage Site (1988) Endemic Bird Area Important Bird Area Alliance for Zero Extinction site (Brooke, 2010) Proposed Ramsar site (2005) Due to become part of the Pitcairn Islands Marine Protected Area (MPA)
Criteria	**Details**
Biological importance	Many species of plant, bird, snail and fish either rare, threatened, endangered or endemic. Seven of 16 species of land snail and 9 of 63 native vascular plants are endemic. The island supports a large breeding population of 12 species of seabirds, including the endemic Henderson petrel *Pterodroma atrata* and also has four endemic landbirds: the Henderson Reed-warbler (*Acrocephalus taiti*), the Henderson Fruit-dove (*Ptilinopus insularis*), the Henderson Lorikeet (*Vini stepheni*) and the Henderson Crake (*Porzana atra*). The beaches and reef flats are important for wintering bristle-

Name of KBA	Henderson Island
	thighed curlews *Numenius tahitiensis*. A small number of green turtle females (c. 10) nest on the east beach of Henderson Island. Endemic fishes (Henderson triplefin *Enneapterygius ornatus,* Henderson squirrelfish *Sargocentron megalops* and a species of combtooth blenny *Alticus* sp. Rich marine molluscan fauna (320 species) compared to the other islands of the Group. 53 species of corals recorded. The island's waters have recently (since the early 1990s) become a regular haunt (and likely calving area) of small numbers of humpback whales during the austral winter. Note that "…the [waters surrounding the] islands remain one of the most pristine marine environments in the world." (Dawson, 2015).
Threats	Invasive species (Pacific rat, *Rattus exulans)*, flotsam & jetsam, sea-level rise. Flotsam & jetsam pose a real problem to seabirds and marine life in particular. Unfortunately, the island's inaccessibility prevents the problem being resolved. Clean-up is almost impossible unless a vessel is chartered which is very costly. A major UK-led rat eradication project was mounted in 2011 but was unsuccessful. RSPB, Island Council and HMG are working collaboratively on the rat situation. Currently happening is a six month field expedition by RSPB to conduct further research on rats, weather and available food sources. RSPB are hoping to gain further data which will assist in a future plan to conduct another eat eradication on Henderson and possibly at Pitcairn too. Invasive/plant control needs to be assessed.
Management	The Island is uninhabited and is difficult to access. External NGOs and organisations have been regularly visiting the island over the past decade and put in place projects or programmes. The main obstacles are lack of both human and financial resources and expertise due to low population (on Pitcairn) and high costs of getting others there. Additional mechanisms for conservation management are required.

10.1.3 KBA Oeno (terrestrial and marine environments)

Image 10.3: Oeno Island (© Google Earth)

Name of KBA	Oeno Island
Description and status	A low, relatively undisturbed coral atoll comprising a central islet surrounded by a lagoon, mostly 3–6 m in depth, which in turn is surrounded by a fringing reef. Uninhabited. Seldom visited and relatively ecologically undisturbed. As a Pitcairn tradition over many years' locals would travel to Oeno in the longboats for rest and relaxation hence permanent campsites were erected but now are dilapidated. Permission to land required from Pitcairn Government. Up to 5 passing yachts per year. Important Bird Area (Brooke 2010) Proposed Ramsar site (2005) Due to become part of the Pitcairn Islands Marine Protected Area (MPA)
Criteria	**Details**
Biological importance	Oeno has an internationally significant wintering population of bristle-thighed curlews *Numenius tahitiensis* and large breeding populations of seabirds. It is an important area for seabirds, hosting more than 10,000 pairs on a regular basis. Presence of endemic gastropods. One of the atoll's most striking features is the large number of giant clams embedded within coral outcrops within the lagoon. Presence of endemic fishes. Highest number of coral species (58) of the Pitcairn Islands Group. Note that "…the [waters surrounding the] islands remain one of the most pristine marine environments in the world." (Dawson, 2015).

Name of KBA	Oeno Island
Threats	Invasive species (plants), sea-level rise, metal waste, flotsam & jetsam. The problem of flotsam & jetsam is less significant in Oeno compared to the other islands. Nevetheless, the island's inaccessibility prevents the problem being resolved. Clean-up is almost impossible unless a vessel is chartered which is very costly. Metal waste removed and clean-up is required but accessibility is the main obstacle. Some evidence from National Geographic expedition was reported that shark numbers were surprisingly low indicating that probable illegal fishing had taken place. Risk of deliberate introduction of pest animals should also be considered.
Management	The Island is uninhabited and is difficult to access. The main obstacles are lack of both human and financial resources and expertise due to low population (on Pitcairn) and high costs of getting others there. Additional mechanisms for conservation management are required.

10.1.4 KBA Ducie (terrestrial and marine environments)

Image 10.4: Ducie Island (© Google Earth)

Name of KBA	Ducie Island
Description and status	A seldom visited, exceptionally undisturbed atoll; the easternmost atoll in the Indo-Pacific biogeographic region, possessing a pure, though impoverished, Polynesian biota. Four islets (motus) constituting Ducie are: Acadia (largest); Pandora; Westward; Edwards (named in 1971 by Rehder & Randall, 1975). Note however that on the most recent chart, following a request by a group of Pitcairners in 1997, the name of Edwards has changed to Te Manu (Irving & Dawson, 2012). Uninhabited. Access by boat only. Too far for boat trips by Pitcairners. Visits by expeditions and occasional yachts. Permission to land required from Pitcairn Government. Important Bird Area (Brooke 2010) Proposed Ramsar site (2005) Due to become part of the Pitcairn Islands Marine Protected Area (MPA)
Criteria	**Details**
Biological importance	It is a very important area for seabirds. 90% of the world's Murphy's Petrels (over 200,000 breeding pairs) nest on Ducie, making the atoll of supreme importance for

Name of KBA	Ducie Island
	this species. It is also important for two other surface-nesting petrels: the Herald and the Kermadec. The high coral cover at Ducie (56%) is exceptional considering the island's location (it is the southernmost atoll in the world and near the east-ernmost limit of coral reef distribution in the Pacific). The coral cover is comparable to several other significant high latitude reefs. Note that "…the [waters surrounding the] islands remain one of the most pristine marine environments in the world." (Dawson, 2015).
Threats	Invasive plants, litter & strandline debris, risk of apex predators (especially sharks) being fished out commercially. During the National Geographic and PEW visit to the Pitcairn Islands in 2012, they filmed numerous dead birds along the shoreline of Ducie and one petrel full of sticky Boerhavia-seed pods that disabled the bird. This plant appears to have recently arrived in Ducie, but how it arrived is unknown. This possibly could have been the cause of the death of many petrels.
Management	The Island is uninhabited and is difficult to access due to its remoteness. The main obstacles are lack of both human and financial resources and expertise due to low population (on Pitcairn) and high costs of getting others there. Additional mechanisms for conservation management are required.

10.2 Thematic priority

Following a consultation held with a number of actors involved in Pitcairn conservation issues, the following priority themes and related actions emerged (no prioritisation was made and the order given below is accidental) - some of the activities mentioned below are already in action.

Fight against INVASIVE species and EROSION

- Implementation of a strategy against invasive alien species;
- Better management of invasive plant species (e.g. roseapple *Syzygium jambos*);
- Further work to complete the successful eradication of the Pacific rat from both Henderson and Pitcairn Islands;
- Special attention should be given to Ducie Island, where anecdotal evidence suggests that the breeding success of certain seabird species is being affected by a plant;
- Set-up of regular and comprehensive monitoring programmes, especially of rare native plant species;
- Strengthening of biosecurity: more information, better control on entry and exit to minimise the risk of contamination;
- Intensification of fight against erosion;
- Reduction of the impact of soil erosion by using proven methods like Enka Mats;
- Addressing storm water issues.

Ecological RESTORATION and CONSERVATION of the natural environment

- Development of programmes of resurvey and nursery propagation of native and endemic species and planting out in the wild;
- Conservation of degraded ecosystems by targeting threatened species;
- Organisation of regular actions for restoration and conservation of particularly important habitats in terms of services provided, possibly in partnership with the population concerned;
- Management of marine litter: both of the uninhabited islands of Henderson and Ducie could be used as monitoring/reference areas for assessing the quantity and diversity of marine litter. With Henderson being a World Heritage Site (on behalf of its “near-pristine ecology”) and Ducie being the southernmost atoll in the world with acknowledged pristine coral reefs, effective publicity backed up by strong science would highlight the plight of these islands and bring the issue of marine litter into the public spotlight worldwide.

RESEARCH

- Surveys and research in all 4 islands to acquire additional data on plant species, invertebrates and marine species to improve knowledge and therefore their protection (e.g. on marine species connectivity of the marine megafauna: humpback whales, sea turtles and sharks; new species to be identified and catalogued, etc.);
- Research on the eradication and control of invasive species of plants and animals; Studies on the impact of climate change (e.g. sea-level rise);
- Improvement of knowledge on the services provided to people by natural ecosystems in the Pitcairn Islands Group;
- Set-up of research facilities on uninhabited islands – this requires infrastructure and

regular access to the islands.

SUSTAINABLE use of natural resources for ECONOMIC purposes

- Integration of environmental considerations into economic activities (e.g. in touristic activities, by promoting environmentally-friendly ship and boat mooring, etc.);
- Promotion of clean and environmentally-friendly methods and techniques in the management of agriculture, livestock, beekeeping, etc.

COMMUNICATION and AWARENESS raising

- Organisation of communication and awareness raising campaigns addressed to wider public on endangered species, key areas to preserve and what makes the natural environment of the Pitcairn Islands unique;
- Communication initiatives addressed to Islanders, tourists and to policy and decision makers on the islands' differing environments, their wildlife, geology and archaeology;
- Production of quality interpretation materials, including ID guides, books, museum enhancement, interactive video loops, further eco-trails etc. This could also encompass special topics and educational materials for the schoolchildren;
- Development of promotional material on Pitcairn Islands natural environment to encourage and promote the Islands' endemic and native flora and fauna (production of brochures, production of content for the Government website…);
- Improvement of public awareness on the value of natural heritage and the importance of ecosystems for the services provided to humans;
- Introduction of the protection of biodiversity into school programmes;
- More communication through signs on remarkable sites and protected species.

Improved MANAGEMENT of natural sites

- Creation of a network to assist in the management of natural sites and protected areas, with a centralised body in charge of managing and securing the necessary funding to coordinate actions;
- Establishment of ranger services;
- Monitoring of the EEZ.

CAPACITY building

- Creation of a local NGO working for the conservation of biodiversity with technical and financial resources in order to improve local capacity;
- Organisation of training sessions for Islanders on environmental education, environmental law, species observation techniques and on the concept of ecosystem services;
- Set-up of a comprehensive management plan engaging international partners to assist with expertise to effectively monitor and manage our entire ecosystem.

11. CONCLUSION

The Pitcairn Islands are a group of four islands comprising: Pitcairn, Henderson, Ducie and Oeno, covering a total land area of 49 km2. They are one of the world's most remote group of islands. Pitcairn itself (the only one of the four islands which is inhabited) had just 51 inhabitants in 2014, all living in the sole settlement, Adamstown.

Over time, the isolation of the Pitcairn Islands has led to the development of a distinct genetic identity and the emergence of highly specialized species with entirely new characteristics.

The native flora of the Pitcairn Islands consists of 81 species. Pitcairn Island itself boasts eleven endemic species of plants. Henderson Island has a total of 63 native floral taxa of which nine are endemic. The molluscan fauna of Henderson is diverse, with at least 16 species belonging to seven families, including seven endemic species. Pitcairn Island was found to support 26 species of land snail, including eight endemic species. There are five species of reef fishes in the near-shore waters surrounding Pitcairn and Henderson which are also restricted to these islands. These islands support 24 bird species, of which six are considered endemic to the territory and five to Henderson.

The Pitcairn Islands have one of the best preserved marine ecosystems on the planet. Being a remote location with minimal human impacts, they are some of the last remaining places on earth where we can observe how coral reef ecosystems may have functioned in the distant past, before extensive human disturbance. These islands have significant coral cover despite being at the southern limit of coral distribution. In addition, the extreme water clarity surrounding the Pitcairn Islands allows for coral growth at depths greater than anywhere else in the Pacific. Deeper habitats may help improve the resilience of ecosystems against potential climate change impacts. They may serve as a refuge from global climatic threats and in this way may serve to increase ecosystem resilience.

The biological importance of the Pitcairn Islands is recognized at the international level. However, the biodiversity of Pitcairn Islands is highly threatened. The IUCN Red List identifies 47 globally threatened species (CR, EN, and VU) across the terrestrial and marine environments of the Pitcairn Islands, which need immediate conservation actions. The main threats affecting Pitcairn Islands' (and Pitcairn Island in particular) biodiversity are posed by habitat clearance, spread of invasive species (including both animals - e.g., goats, cats, rats, mice, wasps, ants and fruit flies - and plants - e.g. Lantana camara, Sorghum sudanense), small species' population sizes or restricted distributions and erosion. Even if human threats are still moderate, immediate action must be taken to prevent the degradation of this precious environment.

Following a consultation held with a number of actors involved in Pitcairn conservation issues, all four islands have been selected as 'Key Biodiversity Areas', mainly based on their biological importance and the level of the existing threats to their biological diversity. These are considered as priority investment sites for the BEST programme.

Priority areas for action were selected in the same participatory manner. As a result of the consultations that took place between May and October 2015, the following priority areas for action were identified:

1. fight against invasive species and erosion,
2. ecological restoration and conservation of the natural environment,
3. research,

4. sustainable use of natural resources for economic purposes,
5. communication and awareness raising,
6. improved management of natural sites and
7. capacity building.

The purpose of this ecosystem profile was to identify priority areas for action that support conservation of biodiversity and sustainable use of ecosystem services including ecosystem-based approaches to climate change adaptation and mitigation. These priories should guide future investments and ensure that funding will be used accordingly. The Key Biodiversity Areas, priority areas for action priority and investment niches identified for the Pitcairn Islands are hoped to be taken into consideration by applicants to potential future BEST and other funds as well as by other donors and organisations wishing to invest in the conservation of the biodiversity of Pitcairn in order to better target their funding and efforts, complementing and broadening the scope of BEST investments. More details on investment niches and opportunities in line with the identified priority areas for action in Pitcairn are outlined in the accompanying document “Regional Investment Strategy” for the Pitcairn Island.

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