

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

UK Overseas Territories Conservation Forum
102 Broadway
Peterborough
Cambridgeshire PE1 4DG
UK
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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

11 November 2004

3. Country:

UK (Pitcairn Islands)

4. Name of the Ramsar site:

Ducie Island

5. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

[Boundary to be: 50m depth contour; or 1.5 km offshore; or polygon approximating to these (depending on practicalities of mapping), in order to include endemic reef fish (and probably invertebrate) species.]

a) hard copy (required for inclusion of site in the Ramsar List): yes -or- no

b) digital (electronic) format (optional):

6. Geographical coordinates (latitude/longitude):

24 41 00 S 124 47 00 W

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Ducie is a low oceanic atoll of exceptional remoteness at the extreme south-east of Polynesia. It is the southernmost atoll in the world. It lies about 450 km East from Pitcairn Island.

Administrative region: Pitcairn Islands

8. Elevation (average and/or max. & min.) (metres): **9. Area** (hectares): **Approx. 800 ha**

Min. 0
Max. 5
Mean ?

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Ducie is a low oceanic atoll of exceptional remoteness at the extreme south-east of Polynesia. It is the southernmost atoll in the world. The fringing reef is oval, roughly 3 km along the east-west axis and 2.5 km along the north-south axis. The single passage at the south-west corner faces south-west and experiences the full impact of the prevailing heavy swells. It is not navigable. The principal motu, called Acadia Island, has an area of 55 ha and stretches for about 3.5 km along the northern reef. Three other small motus are named Edwards, Pandora and Westward; all can be reached by walking from Acadia over the reef at low tide. Their combined land area is about 5 ha.

The central lagoon, up to 12 m deep, is characterised by a well preserved death assemblage of a formerly prolific coral fauna, encrusted by a much sparser live coral assemblage. Presumably the formerly abundant corals have been killed by influxes of cold water at this island which is towards the southern limit of coral growth.

Ducie's remoteness is evident in the depauperate flora. Acadia is covered in a monospecific forest of *Argusia argentea*. A second woody species, *Pemphis acidula*, was recorded in 1991, and there are records from the 1922 Whitney Expedition of a grass and a vine. No other vascular plants are known.

The atoll is a rare, natural representative of its type and supports massive seabird breeding populations of global importance.

11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 3, 4, 6, 7

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

1 Ducie is a low oceanic atoll of exceptional remoteness at the extreme south-east of Polynesia. It is the southernmost atoll in the world. The central lagoon, up to 12 m deep, is characterised by a well preserved death assemblage of a formerly prolific coral fauna, encrusted by a much sparser live coral assemblage. Presumably the formerly abundant corals have been killed by influxes of cold water at this island which is towards the southern limit of coral growth. The atoll qualifies because it is a rare, natural representative of its type.

3 Over 90 percent of the world's Murphy's Petrels nest on Ducie, making the atoll of supreme importance for this species. It is also important for two other surface-nesting *Pterodroma* petrels, the Herald and Kermadec. The fourth seabird species contributing to Ducie's status is the Christmas Shearwater. Because of the species' sub-annual breeding cycle, the current population estimate, a minimum of 3000 pairs, is not especially reliable, but it makes Ducie one of the species' largest colonies, holding around five percent of the known world breeding population (Brooke 2003).

Green Turtles forage in the lagoon but there are no breeding records.

4 See 3 and 6

6 Over 90 percent of the world's Murphy's Petrels nest on Ducie, making the atoll of supreme importance for this species. Ducie holds around five percent of the known world breeding population of the Christmas Shearwater (Brooke 2003).

The populations of Fairy Tern (5000 pairs) and Red-tailed Tropicbird (500-1000) are substantial,

and may exceed one percent of the respective world populations.

- 7 Five species of fishes are presently known **only** from the Pitcairn Islands: the squirrelfish *Sargocentron megalops* Randall, 1998; the many-spined butterflyfish *Hemitaurichthys multispinosus* Randall, 1975; the sand lance *Ammodytes* sp.; the triplefin *Enneapterygius ornatus* Fricke, 1997; and *Alticus* sp.

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

b) biogeographic regionalisation scheme (include reference citation):

14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	
Geomorphology and landscape	island
Nutrient status	
pH	
Salinity	
Soil	
Water permanence	
Summary of main climatic features	

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Ducie is a low oceanic atoll of exceptional remoteness at the extreme south-east of Polynesia. It is the southernmost atoll in the world. There is a lagoon, fringing reef and 60 ha of motus. The fringing reef is oval, roughly 3 km along the east-west axis and 2.5 km along the north-south axis. The single passage at the south-west corner faces south-west and experiences the full impact of the prevailing heavy swells. It is not navigable. The principal motu, called Acadia Island, has an area of 55 ha and stretches for about 3.5 km along the northern reef. Three other small motus are named Edwards, Pandora and Westward; all can be reached by walking from Acadia over the reef at low tide. Their combined land area is about 5 ha.

The central lagoon, up to 12 m deep, is characterised by a well preserved death assemblage of a formerly prolific coral fauna, encrusted by a much sparser live coral assemblage. Presumably the formerly abundant corals have been killed by influxes of cold water at this island which is towards the southern limit of coral growth.

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

17. Wetland types

Code	Name	% Area
C	Coral reefs	100

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

Ducie is a low oceanic atoll of exceptional remoteness at the extreme south-east of Polynesia. It is the southernmost atoll in the world. The fringing reef is oval, roughly 3 km along the east-west axis and 2.5 km along the north-south axis. The single passage at the south-west corner faces south-west and experiences the full impact of the prevailing heavy swells. It is not navigable. The principal motu, called Acadia Island, has an area of 55 ha and stretches for about 3.5 km along the northern reef. Three other small motus are named Edwards, Pandora and Westward; all can be reached by walking from Acadia over the reef at low tide. Their combined land area is about 5 ha.

The central lagoon, up to 12 m deep, is characterised by a well preserved death assemblage of a formerly prolific coral fauna, encrusted by a much sparser live coral assemblage. Presumably the formerly abundant corals have been killed by influxes of cold water at this island which is towards the southern limit of coral growth.

Ducie receives visits once or twice a year from cruise ships which land their passengers on the north shore of Acadia. It is quite possible that there are other visits which are unrecorded, but probably infrequent.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Ducie's remoteness is evident in the depauperate flora. Acadia is covered in a monospecific forest of *Argusia argentea*. A second woody species, *Pemphis acidula*, was recorded in 1991, and there are records from the 1922 Whitney Expedition of a grass and a vine. No other vascular plants are known.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Over 90 percent of the world's Murphy's Petrels nest on Ducie, making the atoll of supreme importance for this species. It is also important for two other surface-nesting *Pterodroma* petrels, the Herald and Kermadec. All three species may benefit from the 1997 eradication of Pacific rats. It is also possible that Henderson Petrels may begin to nest again on Ducie. However Ducie's extreme remoteness probably precludes any monitoring of population recoveries.

The fourth seabird species contributing to Ducie's status is the Christmas Shearwater. Because of the species' sub-annual breeding cycle, the current population estimate, a minimum of 3000 pairs, is not

especially reliable, but it makes Ducie one of the species' largest colonies, holding around five percent of the known world breeding population (Brooke 2003).

Phoenix Petrels, considered globally vulnerable, apparently disappeared from Oeno (DUCIE!) between the Whitney visit in 1922 and the 1991/1992 Expedition,

The populations of Fairy Tern (5000 pairs) and Red-tailed Tropicbird (500-1000) are substantial, and may exceed one percent of the respective world populations. Other seabird species breed in lesser numbers.

There are no landbirds on Ducie.

Congregations

More than 1% of world population

Murphy's Petrel	250,000 pairs (1991)
Herald Petrel	10,000-100,000 pairs (1991)
Kermadec Petrel	c. 30,000 pairs (1991)
Christmas Shearwater	c. 3,000 pairs (1991)
Red-tailed Tropicbird	500-1000 pairs (1991), possibly around 1% of the world population
Fairy Tern	c. 5000 pairs (1991), may exceed 1% of the world population

Other wildlife

For all taxonomic groups hitherto investigated, Ducie has proved to be poor in species. This is a consequence of its isolation at the extreme south-east of Polynesia, the source of nearly all taxa. Somewhat perversely, the very paucity of species is what makes the atoll so interesting to students of biogeography.

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc.
Distinguish between historical/archaeological/religious significance and current socio-economic values.

22. Land tenure/ownership:

Ownership category	On-site	Off-site
Crown	+	+

23. Current land (including water) use:

Activity	On-site	Off-site	Scale
Cruise ship visits	+	+	1 or 2 per year

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Activity	On-site	Off-site	Scale

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Rats were eradicated from the island in 1997. The project with WAS carried out by Wildlife Management International with funding from the British Department for International Development and WWF (UK)		

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

The vegetation of Ducie could alter drastically, with consequences for birdlife, if certain plant species (e.g. *Lantana camara*) reached the island. Great care should be taken to avoid the accidental or deliberate introduction of exotic species. For example, soil, seeds or seedlings should not be taken to Ducie. Visitors should be reminded of the need to take the greatest care not to carry seeds ashore on clothing, on footwear or in camera bags. This reminder could be given on Pitcairn if the visitors are planning to reach Ducie from the west or, with the co-operation of Chilean authorities, on Easter Island if the visitors are coming from the east.

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

None

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

None

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

1 or 2 cruise-ship visits per year

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Pitcairn Islands Administration, PO Box 105696, Auckland, New Zealand
(Shortland Towers, Shortland Street, Auckland)

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Commissioner, Pitcairn Islands Administration, , PO Box 105696, Auckland, New Zealand
(Shortland Towers, Shortland Street, Auckland, New Zealand)

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 13 above), list full reference citation for the scheme.

Site-relevant references

Benton, TG & Spencer, T (eds.) (1995) *The Pitcairn Islands: biogeography, ecology and prehistory*. Academic Press, London

Brooke, M. de L. (2005) Important Bird Areas in the Pitcairn Islands. In Sanders, S.M. et al (eds) *Important Bird Areas in the United Kingdom Overseas Territories*. RSPB, Sandy, UK.

Hepburn, I, Oldfield, S & Thompson, K (1992) *UK Dependent Territories Ramsar study: Stage 1*. Unpublished report to Department of the Environment, European and International Habitat Protection Branch, Bristol, from International Waterfowl and Wetlands Research Bureau/ NGO Forum for Nature Conservation in UK Dependent Territories, Slimbridge/ Sandy (Research contract, No. 7/2/126)

Randall, J.E. 1999. Report on Fish Collections from the Pitcairn Islands. *Atoll Research Bulletin*, No. 461.

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1. Name and address of the compiler of this form:

UK Overseas Territories Conservation Forum

102 Broadway

Peterborough

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UK

Email: pienkowski@cix.co.uk

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

11 November 2004

3. Country:

UK (Pitcairn Islands)

4. Name of the Ramsar site:

Henderson Island

5. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

[Boundary to be: 50m depth contour; or 1.5 km offshore; or polygon approximating to these (depending on practicalities of mapping), in order to include endemic reef fish (and probably invertebrate) species.]

a) hard copy (required for inclusion of site in the Ramsar List): *yes* -or- *no*

b) digital (electronic) format (optional):

6. Geographical coordinates (latitude/longitude):

24 20 00 S 128 19 00 W

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Henderson lies 160 km ENE from Pitcairn Island

Administrative region: Pitcairn Islands

8. Elevation (average and/or max. & min.) (metres): **9. Area** (hectares): 3700

Min. 0

Max. 33

Mean ?

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Henderson Island is, without question, one of the world's best remaining examples of an uplifted coral atoll. Compared to other such raised atolls, it has suffered limited disturbance. Thus the original

ecosystem is largely intact, and the number of introduced species is low. Thus the island plateau is what was formerly the lagoon floor. It is cloaked in dense vegetation, growing on poor limestone soil and coral rubble. There is no permanent water and the rocks are often savagely fissured. The fact that the island is uplifted, and therefore, unlike a low atoll, secure from the devastating effects of periodic inundation during tropical storms, has been important in permitting the evolution of the wide range of endemic species.

There are fringing reefs along the east, north and north-west coasts. Behind each of these reefs is a beach, with beach-back vegetation, before steep slopes or cliffs rise to the plateau. Where there is no reef, the sea beats directly against sheer 30m cliffs. The tidal range is small, about 1 m.

The island supports several endemic bird species, and is globally important too in supporting substantial numbers of breeding seabirds. Seven of 16 species of land snail and nine of 63 native vascular plant species are endemic. Endemicity is also likely to be comparably high in the insect fauna where about 180 species are known to date. Several inshore fish are presently known only from the Pitcairn Islands, including Henderson.

11. Ramsar Criteria:

1, 2, 3, 4, 5, 6, 7

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

- 1 Henderson Island is, without question, one of the world's best remaining examples of an uplifted coral atoll. Compared to other such raised atolls, it has suffered limited disturbance. Thus the original ecosystem is largely intact, and the number of introduced species is low.

There are fringing reefs along the east, north and north-west coasts. Behind each of these reefs is a beach, with beach-back vegetation, before steep slopes or cliffs rise to the plateau. Where there is no reef, the sea beats directly against sheer 30m cliffs. The tidal range is small, about 1 m.

- 2 Supports the endemic Henderson Crake (Vulnerable) and is the principle breeding station of the Henderson Petrel (Endangered), supporting c. 16,000 pairs (1991) of this species. Globally vulnerable Bristle-thighed Curlews winter regularly on the island.

- 3 Seven of 16 species of land snail and nine of 63 native vascular plant species are endemic. Endemicity is also likely to be comparably high in the insect fauna where about 180 species are known to date.

Green Turtles nest in small numbers, but important in terms of range.

- 4 See 3, 5 & 6

- 5 Supports well over 20,000 waterbirds, including some 10,000 pairs of Fairy Terns (1991), as well as the other species noted.

- 6 Henderson Island qualifies on account of supporting 100% of the population of the Henderson Crake, as well as substantial populations of three surface-nesting gadfly petrel species. The most important of these is that of the Henderson Petrel (see 2). The populations of Herald and Kermadec Petrel are 11,100 and 10,000 pairs respectively, in both cases about 20 percent of the species' world populations (Brooke 2003). Fairy Tern: > 1% breeding population
- 7 Five species of fishes are presently known only from the Pitcairn Islands: the squirrelfish *Sargocentron megalops* Randall, 1998 (described from specimen caught at Henderson); the many-spined butterflyfish *Hemitaurichthys multispinosus* Randall,; the sand lance *Ammodytes* sp.; the triplefin *Enneapterygius ornatus* Fricke, 1997 (described from specimen caught at Henderson); and *Alticus* sp. (an undescribed species present at both Pitcairn and Henderson).

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) **biogeographic region:**

b) **biogeographic regionalisation scheme** (include reference citation):

14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	
Geomorphology and landscape	island
Nutrient status	
pH	
Salinity	
Soil	
Water permanence	
Summary of main climatic features	Weather records have only been maintained during 1991/92 when the mean monthly maximum varied from 29.6°C (Feb. 1991) to 24.2°C (June 1991); the comparable minima in those two months were 22.2°C and 15.7°C respectively. Rainfall from February 1991 to January 1992 was 1623 mm.

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Henderson Island is one of the world's best remaining examples of an uplifted coral atoll. Uplift occurred via lithospheric flexure when the oceanic floor became loaded under Pitcairn Island. The island now rises 33 m above sea level, and is believed to have been emergent for approximately 380,000 years (Blake). Thus the island plateau is what was formerly the lagoon floor. It is cloaked in dense vegetation, growing on poor limestone soil and coral rubble. There is no permanent water and the rocks are often savagely fissured.

There are fringing reefs along the east, north and north-west coasts. Behind each of these reefs is a beach, with beach-back vegetation, before steep slopes or cliffs rise to the plateau. Where there is no reef, the sea beats directly against sheer 30m cliffs. The tidal range is small, about 1 m.

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

17. Wetland types

Code	Name	% Area
A	Permanent shallow waters	30
C	Coral reefs	3
D	Rocky marine shores, cliffs and rocky islands	63
E	Sand, shingle or pebble shores	4

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

Henderson Island is, without question, one of the world's best remaining examples of an uplifted coral atoll. Compared to other such raised atolls, it has suffered limited disturbance. Thus the original ecosystem is largely intact, and the number of introduced species is low. Uplift occurred via lithospheric flexure when the oceanic floor became loaded under Pitcairn Island. The island now rises 33 m above sea level, and is believed to have been emergent for approximately 380,000 years (Blake). Thus the island plateau is what was formerly the lagoon floor. It is cloaked in dense vegetation, growing on poor limestone soil and coral rubble. There is no permanent water and the rocks are often savagely fissured. The fact that the island is uplifted, and therefore, unlike a low atoll, secure from the devastating effects of periodic inundation during tropical storms, has been important in permitting the evolution of the wide range of endemic species.

There are fringing reefs along the east, north and north-west coasts. Behind each of these reefs is a beach, with beach-back vegetation, before steep slopes or cliffs rise to the plateau. Where there is no reef, the sea beats directly against sheer 30m cliffs. The tidal range is small, about 1 m.

Archaeological studies have revealed that Henderson was occupied by Polynesians from early in the eight century AD for at least the next 600 years. While the human population may have reached 100, it is uncertain whether there was seasonal ebb and flow between Henderson and Pitcairn when, for example, people travelled to Henderson to exploit turtles during their nesting season. Certainly the Polynesians ate birds in large numbers. They introduced Pacific rats. They also burned the northern and eastern margins of the plateau inland from their habitation sites, at least partly to make way for cultivated species. Whether these several impacts - bird harvesting, rats, horticulture - had any great lasting impact on the plant communities is uncertain. However, at least six of 22 land snail species disappeared because of the Polynesian impact. And the impact on birds was profound. Five landbird species, of which four were endemic to Henderson, disappeared. In addition two or three seabird species were locally extirpated, while the gadfly petrels which continue to breed (see Birds) are probably present in numbers much lower than formerly. Notwithstanding this undeniable Polynesian impact the crux of the conservation perspective, that Henderson is the Pacific's most pristine raised coral island, is not undermined.

Henderson was not discovered by European seafarers until Pedro Fernandez de Quiros passed without landing in 1606. The island received its present name when next visited in 1819 by the *Hercules* under the command of Capt. Henderson. Pitcairners started to use two woods *Cordia subcordata* and

miro *Thespesia populnea* when they were taught artisanal carving techniques. This exploitation of the two species, both of which were probably introduced by the Polynesians, has continued to this day, with the Pitcairners visiting the island once every 1-2 years. Provided due care is taken, exploitation can continue indefinitely on a sustainable basis.

Because crossing the reef is potentially dangerous passing yachtsmen rarely set foot on Henderson. However cruise ships land their passengers once or twice a year, either on the North or the North-west Beaches.

In 1981, an American strip-mining millionaire proposed building a home and airstrip on Henderson. After intense lobbying by the conservation community, the proposal was rejected by the British Government. In 1988 the island was inscribed as a World Heritage Site because it is such a remarkable example of a raised coral atoll. At the time of the inscription, it was widely realised that scientific knowledge of the island was limited. This was partly rectified in 1991/92 when the Sir Peter Scott Commemorative Expedition to the Pitcairn Islands took place. Concentrating its multi-disciplinary scientific efforts on Henderson, the Expedition involved 34 people from seven countries in the field over a 15 month period. Since then, only brief scientific visits have taken place. Monitoring changes in the island's fauna and flora will remain difficult because of the island's exceptional remoteness and ruggedness, the very features that have contributed to preserving it so far.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Nine of 63 native vascular plant species are endemic.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Henderson Island is of the highest ornithological importance, both for its landbirds and its seabirds. All four breeding landbird species are endemic to the island.

Of pre-eminent interest is the flightless Henderson Crake, one of only about five species of flightless rail remaining extant on Pacific islands. Population estimates in 1987 and, using perhaps a more reliable technique, in 1991/92 were 3240 and 6200 individuals respectively (Graves Jones et al.). While some eggs may be lost to the Pacific rats present on Henderson, the crakes are very aggressive towards the rats, and have co-existed with them for some 800 years. There is no immediate concern for the crake, provided other predators do not reach Henderson.

The Henderson Fruit-dove is an endemic representative of a widespread Pacific genus. Its diet includes most fruit species available on the island, but the watery *Procris pedunculata* is especially important. Population estimates in 1987 and 1991/92 were 3420 and 3140 individuals respectively (Graves J, Brooke & Jones).

The Henderson Reed-warbler, formerly considered conspecific with the Pitcairn Reed-warbler, has been the subject of a detailed single-season breeding study which established that about one-third of breeding territories were occupied not by pairs but by trios. Such trios, either two male/one female or one male/two females, were of birds unrelated to each other (check B & H). Population estimates in 1987 and in 1991/92 were individuals respectively (Graves B & H).

The scarcest of the landbirds is the Henderson Lorikeet which feeds on nectar, pollen fruit and also arthropods. No nest has ever been found. It is the only species of *Vini* living in habitats relatively little altered by man. A population estimate in 1987 was 720-1820 individuals (Graves).

A two-day and necessarily superficial inspection visit to Henderson in November 2000 confirmed that all four species remained present in numbers that did not appear to have altered substantially from those suggested by the prior surveys mentioned above.

Henderson Island holds also substantial populations of three surface-nesting gadfly petrel species. The most important of these is that of the Henderson Petrel. While the situation at French Polynesian stations to the north-west of the Pitcairn Islands requires clarification (Thibault & Bretagnolle 1999), it seems likely that the majority, perhaps the overwhelming majority of this taxon, breeds on Henderson where there are 16,000 pairs. The populations of Herald and Kermadec Petrel are 11,100 and 10,000 pairs respectively, in both cases about 20 percent of the species' world populations (Brooke 2003).

There are also about 2500 pairs of Murphy's Petrel, an unimportant number in comparison with those on Ducie and Oeno.

Globally vulnerable Bristle-thighed Curlews winter regularly on the island.

The Fairy Tern population on Henderson numbers thousands and could be as high as 10,000 pairs. There are also small populations of other, widespread tropical seabirds.

A study of the four petrel species in 1991/92 found heavy predation of their chicks by Pacific rats. If such predation occurs every year, then it is probable that either the petrel populations are in long-term decline, or are sustained by immigration. To check whether the 1991/92 situation was typical, it would be useful to re-visit Henderson to check the fate of young petrel chicks. Such a study should concentrate on Murphy's Petrel since only this species has a well-defined breeding season and nests in reasonable aggregations in beach-back vegetation. Study of the other three species is made more difficult by their habit of nesting scattered at low density across the entire island and breeding more or less throughout the year.

Globally threatened species

Henderson Petrel	Endangered	c. 16,000 pairs (1991) of this species for which Henderson is probably the principal breeding station: may be undergoing long-term decline
Henderson Crake	Vulnerable	Common across this one island
Bristle-thighed Curlew	Vulnerable	Up to 50 overwintering, approximately 0.5 % of the world population
Henderson Fruit-dove	Vulnerable	Common across this one island
Henderson Lorikeet	Vulnerable	Patchily occurring across this one island
Henderson Reed-warbler	Vulnerable	Common across this one island

Congregations

More than 1% of world population

Herald Petrel	11,100 pairs (1991)
Kermadec Petrel	c. 10,000 pairs (1991)

Over 10,000 pairs

Fairy Tern Possibly as many as 10,000 pairs (1991)

Other wildlife

Thanks to the work of the Sir Peter Scott Commemorative Expedition, the land flora and fauna of Henderson Island are reasonably well-documented. Among better-studied groups where dispersal is limited, endemism is high. Thus seven of 16 species of land snail and nine of 63 native vascular plant species are endemic. Endemism is also likely to be comparably high in the insect fauna where about 180 species are known to date. Because Henderson is so remote, this 180 total is below what might be expected on the basis of the island's area.

Endemism is lower in some other groups, either because natural dispersal is high (e.g. lichens) or because the species on Henderson include a considerable proportion that 'hitchhiked' to the island in prehistoric times, probably during the Polynesian occupation (e.g. lizards).

During a breeding season that lasts from about December to April, approximately 10 green turtles lay on Henderson. While this number is trivial globally, it represents about one percent of the French Polynesian total.

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc.
Distinguish between historical/archaeological/religious significance and current socio-economic values.

Archaeological studies have revealed that Henderson was occupied by Polynesians from early in the eight century AD for at least the next 600 years. While the human population may have reached 100, it is uncertain whether there was seasonal ebb and flow between Henderson and Pitcairn when, for example, people travelled to Henderson to exploit turtles during their nesting season. Certainly the Polynesians ate birds in large numbers. They introduced Pacific rats. They also burned the northern and eastern margins of the plateau inland from their habitation sites, at least partly to make way for cultivated species. Whether these several impacts - bird harvesting, rats, horticulture - had any great lasting impact on the plant communities is uncertain. However, at least six of 22 land snail species disappeared because of the Polynesian impact. And the impact on birds was profound. Five landbird species, of which four were endemic to Henderson, disappeared. In addition two or three seabird species were locally extirpated, while the gadfly petrels which continue to breed are probably present in numbers much lower than formerly. Notwithstanding this undeniable Polynesian impact the crux of the conservation perspective, that Henderson is the Pacific's most pristine raised coral island, is not undermined.

Henderson was not discovered by European seafarers until Pedro Fernandez de Quiros passed without landing in 1606. The island received its present name when next visited in 1819 by the *Hercules* under the command of Capt. Henderson. Pitcairners started to use two woods *Cordia subcordata* and *Mirothespesia populnea* when they were taught artisanal carving techniques. This exploitation of the two species, both of which were probably introduced by the Polynesians, has continued to this day, with the Pitcairners visiting the island once every 1-2 years. Provided due care is taken, exploitation can continue indefinitely on a sustainable basis.

Because crossing the reef is potentially dangerous passing yachtsmen rarely set foot on Henderson. However cruise ships land their passengers once or twice a year, either on the North or the North-west Beaches.

22. Land tenure/ownership:

Ownership category	On-site	Off-site
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Crown	+	+
-------	---	---

23. Current land (including water) use:

Activity	On-site	Off-site	Scale
Collecting wood for carving	+		
Occasional tourists	+	+	

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Activity	On-site	Off-site	Scale

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
[Domestic site designation?]		
World Heritage Site	+	
Management Plan adopted	+	

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

When Henderson was designated a World Heritage Site by UNESCO, it was on condition that the British Government proceed to develop an agreed management plan for the site. Such a plan was drafted on contract by the Sir Peter Scott Commemorative Expedition and presented to Government in 1992. The draft was circulated for comment and criticisms, none apparently severe, were raised. However the sheer logistical difficulties of getting all legitimately interested parties together to resolve the criticisms meant that the draft was shelved in the mid-1990s. Only in 2002 did the responsible Government Department, the Foreign and Commonwealth Office, realise that the issue awaited resolution. This was achieved in 2004. The full management plan can be down-loaded from www.ukotcf.org.

The principal management goals for Henderson Island are:

- a) to protect the intact status of the island's geology and ecology and of its component flora and fauna - in particular threatened and endemic species, thus conserving the genetic differences between island populations, and the unique genetic contribution of Henderson Island to global diversity.
- b) to ensure that stocks of the timber species (miro and tou) are adequate to meet the needs of Pitcairners on a sustainable basis.
- c) to minimise interference with natural processes and the destruction or degradation of natural and archaeological features through human actions.
- d) to prevent the further introduction of nonnative species and to control or eradicate those alien species established on the island which pose a threat to native wildlife.
- e) to ensure the island's archaeological features are preserved for scientific study and for viewing by visitors.
- f) to ensure tourist visits to the island cause no damage and are beneficial to the Pitcairn Islanders.
- g) to promote an awareness, through education and research, of the intrinsic value and significance of Henderson Island and its biota.

Regardless of whether their damage to petrel breeding success is intermittent or continuous, the eradication of Pacific rats from Henderson would be desirable. However the size of the island means that the necessary poison bait would have to be broadcast by helicopter. To achieve this would require the support of a ship offshore. In addition, captive populations of all four endemic landbird species would need to be established ahead of the eradication work, in case significant numbers of these birds were poisoned by the bait. In other words, rat eradication on Henderson is not presently feasible at sensible cost using currently available techniques. But the situation should be kept under review.

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

No information available

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

No information available

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

No information available

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Pitcairn Islands Administration, PO Box 105696, Auckland, New Zealand
(Shortland Towers, Shortland Street, Auckland)

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Commissioner, Pitcairn Islands Administration, , PO Box 105696, Auckland, New Zealand
(Shortland Towers, Shortland Street, Auckland, New Zealand)

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 13 above), list full reference citation for the scheme.

Site-relevant references

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Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

UK Overseas Territories Conservation Forum
102 Broadway
Peterborough
Cambridgeshire PE1 4DG
UK
Email: pienkowski@cix.co.uk

FOR OFFICE USE ONLY.

DD MM YY

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

11 November 2004

3. Country:

UK (Pitcairn Islands)

4. Name of the Ramsar site:

Oeno Island

5. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

[Boundary to be: 50m depth contour; or 1.5 km offshore; or polygon approximating to these (depending on practicalities of mapping), in order to include endemic reef fish (and probably invertebrate) species.]

a) hard copy (required for inclusion of site in the Ramsar List): *yes* -or- *no*

b) digital (electronic) format (optional):

6. Geographical coordinates (latitude/longitude):

23 56 00 S 130 45 00 W

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Oeno lies 130 km NW of Pitcairn Island

Administrative region: Pitcairn Islands

8. Elevation (average and/or max. & min.) (metres): **9. Area** (hectares): *Approx. 1000 ha*

Min. 0
Max. 4
Mean ?

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Oeno is a low oceanic atoll. The fringing reef is approximately circular and about 4 km in diameter. It is breached by a single passage, on the northern margin. Through this passage, shallow-draft boats (e.g. the Pitcairners' longboats) may enter the lagoon which is uniformly shallow, less than 3 m deep, with scattered reefs. There is a single motu, about 80 ha in extent, south-west of the centre of the lagoon. Today it is connected to a sandspit running northwards towards the reef but, in the recent past, the sandspit has not been connected to the motu.

Oeno is a remarkably undisturbed atoll. The margin comprises either sandy beach or reef flat. Behind this lies shoreline scrub, often dominated by *Suriana maritima*. At the south end of the motu is closed forest of *Argusia argentea* and *Pisonia grandis*, the canopy reaching 7-9 m. Most of the rest of motu is clothed in more or less open *Argusia* scrub. In total there are only 16 vascular plant species present, but this includes the endemic *Bidens hendersonensis* var. *oeniensis*. There is also a stand of coconut trees, introduced by the Pitcairners, at the north of the island.

The island supports globally important numbers of Vulnerable breeding seabird and wintering shorebird populations.

Because the entrance to the lagoon is too shallow to allow the passage of ocean-going yachts and because there is no secure anchorage outside the reef, Oeno is rarely visited. Once or twice a year, the Pitcairners visit the island to camp in the vicinity of the coconut grove. The visits, typically in the southern summer, normally last around a week and are viewed as holidays.

11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 2, 3, 4, 6, 7

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

- 1 Oeno is a remarkably undisturbed atoll. The margin comprises either sandy beach or reef flat. Behind this lies shoreline scrub, often dominated by *Suriana maritima*.
- 2 Phoenix Petrels *P. alba*, considered globally Vulnerable, apparently disappeared from Oeno between the Whitney visit in 1922 and the 1991/1992 Expedition, but perhaps 12-20 pairs were present in 1997 and 1998.
Supports approximately one percent of the world population of the globally Vulnerable Bristle-thighed Curlew in the non-breeding season.
- 3 Around 240 marine molluscs are known, of which about two percent are endemic to the Pitcairn group. One species, a liotinine gastropod, belongs to a genus (and therefore species) hitherto known only from Oeno.
In total there are only 16 vascular plant species present, but this includes the endemic *Bidens hendersonensis* var. *oeniensis*.
About 1% of the world population Red-tailed Tropicbird *Phaethon rubricauda* nest.
- 4 Oeno's chief ornithological importance is the Murphy's Petrel colony, estimated in 1991 at 12,500 pairs and therefore the second largest in the world.

See also 2, 3 & 6

- 6 Oeno's chief ornithological importance is the Murphy's Petrel colony, estimated in 1991 at 12,500 pairs and therefore the second largest in the world. Supports approximately one percent of the world population of the Bristle-thighed Curlew in the non-breeding season. .
- 7 Five species of fishes are presently known only from the Pitcairn Islands: the squirrelfish *Sargocentron megalops* Randall, 1998; the many-spined butterflyfish *Hemitaurichthys multispinosus* Randall, 1975; the sand lance *Ammodytes* sp.; the triplefin *Enneapterygius ornatus* Fricke, 1997; and *Alticus* sp.

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

b) biogeographic regionalisation scheme (include reference citation):

14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	
Geomorphology and landscape	Island
Nutrient status	
pH	
Salinity	
Soil	
Water permanence	
Summary of main climatic features	No information available.

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Oeno is a low oceanic atoll, with lagoon, fringing reef and 80 ha motu. The fringing reef is approximately circular and about 4 km in diameter. It is breached by a single passage, on the northern margin. The lagoon is uniformly shallow, less than 3 m deep, with scattered reefs. There is a single motu, about 80 ha in extent, south-west of the centre of the lagoon. Today it is connected to a sandspit running northwards towards the reef but, in the recent past, the sandspit has not been connected to the motu.

The margin comprises either sandy beach or reef flat. Behind this lies shoreline scrub, often dominated by *Suriana maritima*. At the south end of the motu is closed forest of *Argusia argentea* and *Pisonia grandis*, the canopy reaching 7-9 m. Most of the rest of motu is clothed in more or less open *Argusia* scrub.

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

17. Wetland types

Code	Name	% Area
C	Coral reefs	90
E	Sand, shingle or pebble shores	3
G	Intertidal mud, sand or salt flats	7

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

Oeno is a low oceanic atoll. The fringing reef is approximately circular and about 4 km in diameter. It is breached by a single passage, on the northern margin. Through this passage, shallow-draft boats (e.g. the Pitcairners' longboats) may enter the lagoon which is uniformly shallow, less than 3 m deep, with scattered reefs. There is a single motu, about 80 ha in extent, south-west of the centre of the lagoon. Today it is connected to a sandspit running northwards towards the reef but, in the recent past, the sandspit has not been connected to the motu.

Oeno is a remarkably undisturbed atoll. The margin comprises either sandy beach or reef flat. Behind this lies shoreline scrub, often dominated by *Suriana maritima*. At the south end of the motu is closed forest of *Argusia argentea* and *Pisonia grandis*, the canopy reaching 7-9 m. Most of the rest of motu is clothed in more or less open *Argusia* scrub. In total there are only 16 vascular plant species present, but this includes the endemic *Bidens hendersonensis* var. *oenensis*. There is also a stand of coconut trees, introduced by the Pitcairners, at the north of the island.

The island supports globally important numbers of Vulnerable breeding seabird and wintering shorebird populations.

Because the entrance to the lagoon is too shallow to allow the passage of ocean-going yachts and because there is no secure anchorage outside the reef, Oeno is rarely visited. Once or twice a year, the Pitcairners visit the island to camp in the vicinity of the coconut grove. The visits, typically in the southern summer, normally last around a week and are viewed as holidays.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

The flora of Oeno is poor in species. Only the local variety of *Bidens hendersonensis* is endemic; this was not seen in 1991/92, but was relocated in 1997.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Around 240 marine molluscs are known, of which about two percent are endemic to the Pitcairn group. One species, a liotinine gastropod, belongs to a genus (and therefore species) hitherto known only from Oeno.

Oeno's chief ornithological importance is the Murphy's Petrel colony, estimated in 1991 at 12,500 pairs and therefore the second largest in the world. It would be worthwhile to assess whether the 1997 eradication of Pacific rats from Oeno is followed by an increase in the population of Murphy's Petrels. Similarly, in the light of likely decreases in the breeding populations of Herald *Pterodroma heraldica* and Kermadec Petrels *P. neglecta* between 1922, the year of the Whitney Expedition visit, and 1991/92, checking any recovery of these populations would be useful. Unfortunately monitoring this situation will be difficult because of the intrinsic difficulty of reaching the island and because the Pitcairners' holiday visits to the island are usually in the austral summer rather than during the Murphy's Petrel winter nesting season.

Phoenix Petrels *P. alba*, considered globally Vulnerable, apparently disappeared from Oeno between the Whitney visit in 1922 and the 1991/1992 Expedition, but perhaps 12-20 pairs were present in 1997 and 1998.

Oeno supports populations of other seabirds, notably Red-tailed Tropicbird (500-1000 pairs), Masked Booby *Sula dactylatra* (250-300), Red-footed Booby *S. sula* (25), Greater Frigatebird *Fregata minor* (100) and Fairy Tern *Gygis alba* (< 1000). Among these the tropicbird population may be around one percent of the global population.

Oeno is also important as a wintering site for the Bristle-thighed Curlew. In January 1990 about 100 were recorded, representing approximately one percent of the world of this globally Vulnerable species.

It is possible that the widespread Spotless Crake *Porzana tabuensis* breeds on Oeno for it is seen regularly. Otherwise there are no landbirds.

Globally threatened species

Phoenix Petrel <i>Pterodroma alba</i>	Vulnerable	May nest: see text
Bristle-thighed Curlew <i>Numenius tahitiensis</i>	Vulnerable	Up to 100 overwintering, approximately 1% of the world population

Congregations

Murphy's Petrel <i>Pterodroma ultima</i>	12,500 pairs (1991) More than 1% of world population
Red-tailed Tropicbird <i>Phaethon rubricauda</i>	500-1000 pairs (1991), possibly around 1% of the world population

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc.
Distinguish between historical/archaeological/religious significance and current socio-economic values.

22. Land tenure/ownership:

Ownership category	On-site	Off-site
Crown	+	+

23. Current land (including water) use:

Activity	On-site	Off-site	Scale
Recreation for Pitcairners	+	+	
Tourism	+	+	

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Activity	On-site	Off-site	Scale

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site
Rats were eradicated from the island in 1997. The project was carried out by Wildlife Management International with funding from the British Department for International Development.		

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

The vegetation of Oeno could alter drastically, with consequences for birdlife, if certain plant species (e.g. *Lantana camara*) reached the island. Great care should be taken to avoid the accidental or deliberate introduction of exotic species. For example, soil, seeds or seedlings should not be taken to Oeno from Pitcairn. If newly-arrived weedy species are noticed, they should be uprooted and destroyed immediately. All food waste should be properly buried.

Rats were eradicated from the island in 1997. The project was carried out by Wildlife Management International with funding from the British Department for International Development. As discussed above, logistic difficulties have precluded any monitoring of the impact of this on seabird nesting success or numbers. The most likely route of re-invasion is if rats were transported from Pitcairn, where they are still present, to Oeno in a Pitcairn longboat. This is a real risk since the longboats are loaded with provisions alongside the Pitcairn jetty and then unloaded while at anchor only some 10 metres from Oeno's beaches. When loading for a trip to Oeno, the Pitcairners should take every precaution to ensure the longboats are rat-free.

Tourist visits to Oeno are being actively planned. If such visits are well managed, they need not harm the island's wildlife. It is, however, essential that the operators undertake the strictest precautions to ensure that neither animals nor plants are inadvertently introduced. The risk of such introductions would be greatly increased if ever tourists stayed overnight on Oeno. Equally important, any

developments that depend on dredging or blasting a deeper channel through the reef passage and across the lagoon to the motu should be absolutely prohibited. The risk of altering the sedimentation pattern of the entire lagoon is high, with potentially severe consequences for the marine molluscs. At the extreme, the ensuing change in water flow could lead to the disappearance of most of the island.

Ramsar designation does not preclude ecologically sensitive visits or sustainable local exploitation of reef fish, but recognizes and helps perpetuate Oeno's importance as a haven for birds and as a rare example of a pristine Polynesian lagoon.

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

None

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

None

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

Holiday visits by Pitcairners and cruise-ship visits.

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Pitcairn Islands Administration, PO Box 105696, Auckland, New Zealand
(Shortland Towers, Shortland Street, Auckland)

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Commissioner, Pitcairn Islands Administration, , PO Box 105696, Auckland, New Zealand
(Shortland Towers, Shortland Street, Auckland, New Zealand)

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 13 above), list full reference citation for the scheme.

Site-relevant references

Benton, TG & Spencer, T (eds.) (1995) *The Pitcairn Islands: biogeography, ecology and prehistory*. Academic Press, London

Brooke, M. de L. (2005) Important Bird Areas in the Pitcairn Islands. In Sanders, S.M. et al (eds) *Important Bird Areas in the United Kingdom Overseas Territories*. RSPB, Sandy, UK.

Hepburn, I, Oldfield, S & Thompson, K (1992) *UK Dependent Territories Ramsar study: Stage 1*. Unpublished report to Department of the Environment, European and International Habitat Protection Branch, Bristol, from International Waterfowl and Wetlands Research Bureau/ NGO Forum for Nature Conservation in UK Dependent Territories, Slimbridge/ Sandy (Research contract, No. 7/2/126)

Randall, J.E. 1999. Report on Fish Collections from the Pitcairn Islands. *Atoll Research Bulletin*, No. 461.

Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**

Telephone: +41 22 999 0170 • Fax: +41 22 999 0169 • email: ramsar@ramsar.org

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

UK Overseas Territories Conservation Forum
102 Broadway
Peterborough
Cambridgeshire PE1 4DG
UK
Email: pienkowski@cix.co.uk

FOR OFFICE USE ONLY.

DD MM YY		
Designation date		

Site Reference Number							

2. Date this sheet was completed/updated:

11 November 2004

3. Country:

UK (Pitcairn Islands)

4. Name of the Ramsar site:

Brown's Water, Pitcairn Island

5. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

a) **hard copy** (required for inclusion of site in the Ramsar List): yes -or- no

b) **digital (electronic) format** (optional):

6. Geographical coordinates (latitude/longitude):

25 04 00 S 130 06 00 W

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Central Pitcairn Island

Administrative region: Pitcairn Islands

8. Elevation (average and/or max. & min.) (metres): **9. Area** (hectares):

Min. No information available
Max. No information available
Mean 0

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Pitcairn is a rugged volcanic island, 5 km² in area, that reaches a maximum height of 347 m. Much of the coastline is either cliff or extremely steep slope. There is no fringing reef, but there is a reef zone around the island.

Pitcairn is the only inhabited island in the wider Pitcairn group. It has been inhabited almost continuously since the Bounty mutineers and their Polynesian consorts settled in 1790. There was an

earlier period of Polynesian settlement, but this had ended before the arrival of the mutineers and there is little knowledge of its effect on the wildlife populations. The last half century has seen a steady dwindling of the human population which numbered about 50 in 2003.

Both tropical and temperate fruits and vegetables thrive in the fertile volcanic soil, and extensive areas are given over to their cultivation, mostly for local consumption. Other areas of the island are dominated by introduced plants, notably *Lantana camara* and rose-apple *Syzygium jambos*, both of which invade other communities and thereby threaten native plants. Guava *Psidium cattleianum* is also widespread. There are also conspicuous areas where all topsoil has been lost, and heavy erosion is evident. As a result of these several processes - horticulture, alien species and erosion - native vegetation is now restricted to small pockets which are principally situated close to the island's summit ridge or in steep valleys on the south side of Pitcairn.

The Brown's Water site on Pitcairn seems to be the only predictable flowing water feature in the whole island group. Seepage occurs at a damp rock face and water runs through a narrow gully. Despite invasion by Rose Apple, this site, especially the upper part, is home to many rare Pitcairn plants, including an actively regenerating population of the endemic *Angiopteris pitcairnensis*. Water is extracted from lower down the gully, which would seem to be entirely within the sustainable use remit of Ramsar notification. [The precise area of the site would need to be defined.]

11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

1, 2, 3

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

- 1 The Brown's Water site on Pitcairn seems to be the only predictable flowing water feature in the whole island group. Seepage occurs at a damp rock face and water runs through a narrow gully. Despite invasion by Rose Apple, this site, especially the upper part, is home to many rare Pitcairn plants, including an actively regenerating population of the endemic *Angiopteris pitcairnensis*.
- 2 Pitcairn Island is the only nesting locality of the globally vulnerable Pitcairn Reed-warbler *Acrocephalus vaughani*.
- 3 Many rare Pitcairn plants, including an actively regenerating population of the endemic *Angiopteris pitcairnensis*. The flora of Pitcairn includes 80 species of native vascular plants, of which ten, two ferns and eight angiosperms, are endemic. Fifty one of the native vascular plants are threatened. Particular concern attaches to the endemic *Coprosma benefica*, known from only 11 individuals, and the endemic fern *Angiopteris chauliodonta*, restricted to small and fragmented populations. Other species (e.g. *Cyclophyllum barbatum*, *Psydrax odoratum*) are becoming rare as they are utilised by the Islanders. Their populations could be enhanced by nursery propagation (see conservation issues). Several species are poorly dispersed on Pitcairn (e.g. *Coprosma*, *Psydrax*, *Xylosma suaveolens*) due to the lack of a frugivorous bird to disperse fruit.

Eight of Pitcairn's 26 species of extant land snail are endemic; three survive only in small remnants of native vegetation around one hectare in extent. If rose-apple or *Lantana* were to invade these remnants and create an understory inimical to these taxa, they would probably become extinct. Brown's Water could be invaded by these two plants.

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

b) biogeographic regionalisation scheme (include reference citation):

14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	
Geomorphology and landscape	
Nutrient status	
pH	
Salinity	
Soil	
Water permanence	
Summary of main climatic features	Lying towards the south of the tradewind belt, the island enjoys a mild climate with easterly winds predominating, markedly so in the austral summer. The mean annual temperature (measured at a weather station at 264 m) is 21.2°C, with about a ten degree difference between the warmest and coldest months. The mean annual rainfall is 1716 mm, with no marked seasonal variation.

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

No information available

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

Water supply for island.

17. Wetland types

Code	Name	% Area
M	Permanent rivers/streams/creeks	100

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

Pitcairn is a rugged volcanic island, 5 km² in area, that reaches a maximum height of 347 m. Much of the coastline is either cliff or extremely steep slope. There is no fringing reef, but there is a reef zone around the island.

Pitcairn is the only inhabited island in the wider Pitcairn group. It has been inhabited almost continuously since the Bounty mutineers and their Polynesian consorts settled in 1790. There was an earlier period of Polynesian settlement, but this had ended before the arrival of the mutineers and there is little knowledge of its effect on the wildlife populations. The last half century has seen a steady dwindling of the human population which numbered about 50 in 2003.

Both tropical and temperate fruits and vegetables thrive in the fertile volcanic soil, and extensive areas are given over to their cultivation, mostly for local consumption. Other areas of the island are dominated by introduced plants, notably *Lantana camara* and rose-apple *Syzygium jambos*, both of which invade other communities and thereby threaten native plants. Guava *Psidium cattleianum* is also widespread. There are also conspicuous areas where all topsoil has been lost, and heavy erosion is evident. As a result of these several processes - horticulture, alien species and erosion - native vegetation is now restricted to small pockets which are principally situated close to the island's summit ridge or in steep valleys on the south side of Pitcairn.

The Brown's Water site on Pitcairn seems to be the only predictable flowing water feature in the whole island group. Seepage occurs at a damp rock face and water runs through a narrow gully. Despite invasion by Rose Apple, this site, especially the upper part, is home to many rare Pitcairn plants, including an actively regenerating population of the endemic *Angiopteris pitcairnensis*. Water is extracted from lower down the gully, which would seem to be entirely within the sustainable use remit of Ramsar notification.

19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.

Many rare Pitcairn plants, including an actively regenerating population of the endemic *Angiopteris pitcairnensis*. The flora of Pitcairn includes 80 species of native vascular plants, of which ten, two ferns and eight angiosperms, are endemic. Fifty one of the native vascular plants are threatened. Particular concern attaches to the endemic *Coprosma benefica*, known from only 11 individuals, and the endemic fern *Angiopteris chauliodonta*, restricted to small and fragmented populations. Other species (e.g. *Cyclophyllum barbatum*, *Psydrax odoratum*) are becoming rare as they are utilised by the Islanders. Their populations could be enhanced by nursery propagation (see conservation issues). Several species are poorly dispersed on Pitcairn (e.g. *Coprosma*, *Psydrax*, *Xylosma suaveolens*) due to the lack of a frugivorous bird to disperse fruit.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.

Pitcairn Island is the only nesting locality of the globally vulnerable Pitcairn Reed-warbler *Acrocephalus vaughani*. Although now separated as a full species, the warbler has in the past been considered conspecific with the Henderson Reed-warbler *Acrocephalus taiti* and the Rimatara Reed-warbler *A. rimatarae*. Pitcairn's warbler has not been subject to any detailed study, but it appears to be distributed throughout the island in all habitats vegetated with shrubs or trees. If its density is similar to that of the Henderson Reed-warbler, then its population may be around 1500. There are no other breeding landbird species while, because of the presence of feral cats and Pacific rats, seabirds breed only on inaccessible cliffs in small numbers.

Eight of Pitcairn's 26 species of extant land snail are endemic; three survive only in small remnants of native vegetation around one hectare in extent. If rose-apple or *Lantana* were to invade these remnants and create an understory inimical to these taxa, they would probably become extinct.

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc.
Distinguish between historical/archaeological/religious significance and current socio-economic values.

Water supply

22. Land tenure/ownership:

Ownership category	On-site	Off-site
Crown	+	+

23. Current land (including water) use:

Activity	On-site	Off-site	Scale
Water supply	+	+	

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Activity	On-site	Off-site	Scale

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

For the obvious reason that it is the only inhabited island in the Pitcairn group, Pitcairn is the most ecologically disturbed. Nonetheless it remains of significant conservation interest, notably from a botanical point of view. The preservation of the native flora will require a combination of measures, including ex-situ propagation, in-situ protection, and control of rose apple.

To aid ex-situ propagation, a small nursery was started in 1998. The critically threatened *Coprosma* (see other wildlife) is a good candidate for propagation, from cuttings and seeds, followed by planting out. Propagation of *Angiopteris* from spores is likely to be difficult because the gametophyte is mycotrophic, but is worth attempting.

While the rose-apple has not yet invaded the southern flank of Pitcairn, this will probably happen in due time if not prevented. Ideally the best pockets of native vegetation should be weeded periodically, for example in Faute Valley and Tautama. Funding for the labour involved is required. Consideration should also be given to protecting at least parts of these areas from goats by fencing.

Other important pockets of native vegetation (e.g. Brown's Water, home to a high number of endemic and threatened species) should be protected from road encroachment.

The large tracts of rose-apple growing over Pitcairn are of little wildlife value. In the long-term, it would be ideal if this introduced invasive species could be replaced by native and especially threatened species. To this end, seedlings grown in the nursery could be planted out in small areas where the rose-apple had been cleared. This general methodology will perhaps need refining in the light of experience, but is certainly to be preferred to wholesale clearance of rose-apple. Since little grows underneath rose-apple, such clearance would undoubtedly be accompanied by loss of topsoil and erosion. To move this project forward needs funding urgently.

Since the Pitcairn Reed-warbler appears able to co-exist with Pacific rats and with feral cats, and to live in a variety of altered and disturbed habitats, there appears no immediate cause for concern. This would change were other rat species to reach Pitcairn.

In 1997 and 1998, two attempts to eradicate rats were made using hand distribution of poison baits. If successful, the eradication would have contributed to human welfare, allowed the recolonisation of Pitcairn by surface-nesting seabirds, and reduced the risk that Oeno (see that island's account) would be re-invaded by rats. While the attempts certainly reduced the rat population to a very low level, with immediate evident benefits to the Islanders' fruit and vegetable crops, neither attempt was successful. Inevitably it is impossible to be certain about the reason(s) for failure, but there is wide agreement that, in the event of a third attempt, the period of monitoring by dedicated personnel after the main bait distribution should be lengthened to several months.

There is a population of free-ranging goats on Pitcairn. When numbers increase beyond about 50, the situation at the time of writing, their impact on the vegetation and erosion visibly escalate. Regular culling is justified.

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

No information available

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

No information available

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

No information available

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Pitcairn Islands Administration, PO Box 105696, Auckland, New Zealand
(Shortland Towers, Shortland Street, Auckland)

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Commissioner, Pitcairn Islands Administration, , PO Box 105696, Auckland, New Zealand
(Shortland Towers, Shortland Street, Auckland, New Zealand)

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 13 above), list full reference citation for the scheme.

Site-relevant references

- Benton, TG & Spencer, T (eds.) (1995) *The Pitcairn Islands: biogeography, ecology and prehistory*. Academic Press, London
- Brooke, M. de L. (2005) Important Bird Areas in the Pitcairn Islands. In Sanders, S.M. et al (eds) *Important Bird Areas in the United Kingdom Overseas Territories*. RSPB, Sandy, UK.
- Hepburn, I, Oldfield, S & Thompson, K (1992) *UK Dependent Territories Ramsar study: Stage 1*. Unpublished report to Department of the Environment, European and International Habitat Protection Branch, Bristol, from International Waterfowl and Wetlands Research Bureau/ NGO Forum for Nature Conservation in UK Dependent Territories, Slimbridge/ Sandy (Research contract, No. 7/2/126)
- Kingston, N. & Waldren, S. (2003). The plant communities and environmental gradients of Pitcairn Island: the significance of invasive species and the need for conservation management. *Annals of Botany*, **92**: 31-40.
- Kingston N.E. & Waldren S. (2004) Conservation genetics and ecology of *Angiopteris chauliodonta* Copel., a critically endangered fern from Pitcairn Island, South Central Pacific Ocean. *Biological Conservation*. (in press)
- Kingston, N. & Waldren, S. (in press) A conservation appraisal of the rare and endemic vascular plants of Pitcairn Island. *Biodiversity and Conservation*.
- Randall, J.E. 1999. Report on Fish Collections from the Pitcairn Islands. *Atoll Research Bulletin*, No. 461.

Please return to: **Ramsar Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone: +41 22 999 0170 • Fax: +41 22 999 0169 • email: ramsar@ramsar.org

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

1. Name and address of the compiler of this form:

UK Overseas Territories Conservation Forum
102 Broadway
Peterborough
Cambridgeshire PE1 4DG
UK
Email: pienkowski@cix.co.uk

FOR OFFICE USE ONLY.

DD MM YY		
Designation date		

Site Reference Number							

2. Date this sheet was completed/updated:

11 November 2004

3. Country:

UK (Pitcairn Islands)

4. Name of the Ramsar site:

Coastal Waters, Pitcairn Island

5. Map of site included:

Refer to Annex III of the *Explanatory Notes and Guidelines*, for detailed guidance on provision of suitable maps.

[Boundary of reef to be: 50m depth contour; or 1.5 km offshore; or polygon approximating to these (depending on practicalities of mapping), in order to include endemic reef fish (and probably invertebrate) species.]

a) hard copy (required for inclusion of site in the Ramsar List): *yes* -or- *no*

b) digital (electronic) format (optional):

6. Geographical coordinates (latitude/longitude):

25 04 00 S 130 06 00 W

7. General location:

Include in which part of the country and which large administrative region(s), and the location of the nearest large town.

Waters surrounding Pitcairn Island

Administrative region: Pitcairn Islands

8. Elevation (average and/or max. & min.) (metres): **9. Area** (hectares):

Min. 0
Max. 0
Mean 0

10. Overview:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

Pitcairn is a rugged volcanic island, 5 km² in area, that reaches a maximum height of 347 m. Much of the coastline is either cliff or extremely steep slope. There is no fringing reef, but there is a reef zone around the island. The inshore waters support endemic fish species.

Pitcairn is the only inhabited island in the wider Pitcairn group. It has been inhabited almost continuously since the Bounty mutineers and their Polynesian consorts settled in 1790. There was an earlier period of Polynesian settlement, but this had ended before the arrival of the mutineers and there is little knowledge of its effect on the wildlife populations. The last half century has seen a steady dwindling of the human population which numbered about 50 in 2003.

11. Ramsar Criteria:

Circle or underline each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11).

7

12. Justification for the application of each Criterion listed in 11. above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

- 7 Five species of fishes are presently known only from the Pitcairn Islands: the squirrelfish *Sargocentron megalops* Randall, 1998; the many-spined butterflyfish *Hemitaurichthys multispinosus* Randall, 1975 (described from specimen caught at Pitcairn); the sand lance *Ammodytes* sp. (an undescribed species from Pitcairn); the triplefin *Enneapterygius ornatus* Fricke, 1997; and *Alticus* sp. (an undescribed species present at both Pitcairn and Henderson).

13. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

b) biogeographic regionalisation scheme (include reference citation):

14. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

Soil & geology	
Geomorphology and landscape	
Nutrient status	
pH	
Salinity	
Soil	
Water permanence	

Summary of main climatic features	Lying towards the south of the tradewind belt, the island enjoys a mild climate with easterly winds predominating, markedly so in the austral summer. The mean annual temperature (measured at a weather station at 264 m) is 21.2°C, with about a ten degree difference between the warmest and coldest months. The mean annual rainfall is 1716 mm, with no marked seasonal variation.
-----------------------------------	--

15. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

Oceanic island

16. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

17. Wetland types

Code	Name	% Area
A	Permanent shallow marine waters	100

18. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

Pitcairn is a rugged volcanic island, 5 km² in area, that reaches a maximum height of 347 m. Much of the coastline is either cliff or extremely steep slope. There is no fringing reef, but there is a reef zone around the island. There is no fringing reef, but there is a reef zone around the island. The inshore waters support endemic fish species.

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19. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Many rare Pitcairn plants, including an actively regenerating population of the endemic *Angiopteris pitcairnensis*. The flora of Pitcairn includes 80 species of native vascular plants, of which ten, two ferns and eight angiosperms, are endemic. Fifty one of the native vascular plants are threatened. Particular concern attaches to the endemic *Coprosma benefica*, known from only 11 individuals, and the endemic fern *Angiopteris chauliodonta*, restricted to small and fragmented populations. Other species (e.g. *Cyclophyllum barbatum*, *Psydrax odoratum*) are becoming rare as they are utilised by the Islanders. Their populations could be enhanced by nursery propagation (see conservation issues).

Several species are poorly dispersed on Pitcairn (e.g. *Coprosma*, *Psydrax*, *Xylosma suaveolens*) due to the lack of a frugivorous bird to disperse fruit.

20. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. Justification for the application of the Criteria) indicating, e.g. which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Pitcairn Island is the only nesting locality of the globally vulnerable Pitcairn Reed-warbler *Acrocephalus vaughani*. Although now separated as a full species, the warbler has in the past been considered conspecific with the Henderson Reed-warbler *Acrocephalus taiti* and the Rimatara Reed-warbler *A. rimatarae*. Pitcairn's warbler has not been subject to any detailed study, but it appears to be distributed throughout the island in all habitats vegetated with shrubs or trees. If its density is similar to that of the Henderson Reed-warbler, then its population may be around 1500. There are no other breeding landbird species while, because of the presence of feral cats and Pacific rats, seabirds breed only on inaccessible cliffs in small numbers.

Eight of Pitcairn's 26 species of extant land snail are endemic; three survive only in small remnants of native vegetation around one hectare in extent. If rose-apple or *Lantana* were to invade these remnants and create an understory inimical to these taxa, they would probably become extinct.

21. Social and cultural values:

e.g. fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values.

22. Land tenure/ownership:

Ownership category	On-site	Off-site
Crown	+	+

23. Current land (including water) use:

Activity	On-site	Off-site	Scale

24. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

Activity	On-site	Off-site	Scale

25. Conservation measures taken:

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

Conservation measure	On-site	Off-site

26. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

27. Current scientific research and facilities:

e.g. details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

No information available

28. Current conservation education:

e.g. visitor centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

No information available

29. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

No information available

30. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept. of Agriculture/Dept. of Environment, etc.

Pitcairn Islands Administration, PO Box 105696, Auckland, New Zealand
(Shortland Towers, Shortland Street, Auckland)

31. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Commissioner, Pitcairn Islands Administration, , PO Box 105696, Auckland, New Zealand
(Shortland Towers, Shortland Street, Auckland, New Zealand)

32. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see **13** above), list full reference citation for the scheme.

Site-relevant references

- Benton, TG & Spencer, T (eds.) (1995) *The Pitcairn Islands: biogeography, ecology and prehistory*. Academic Press, London
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