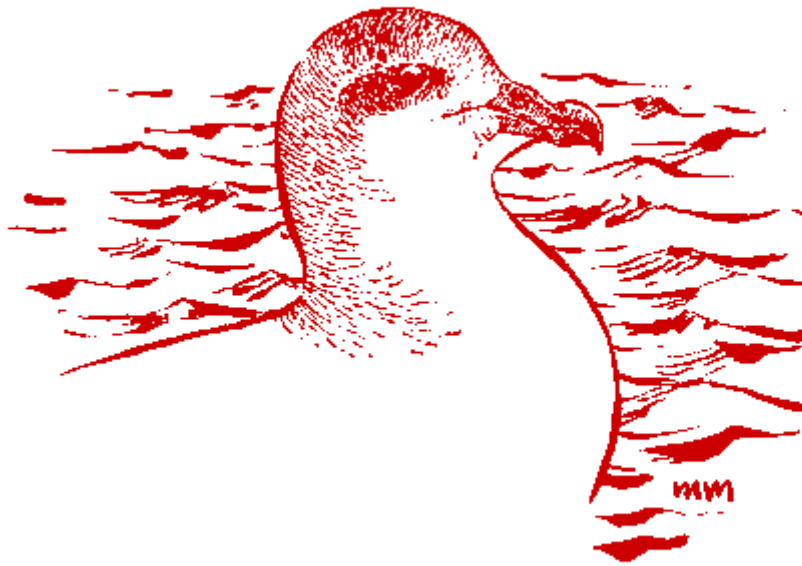


ACTION PLAN FOR FEA'S PETREL
(Pterodroma feae)



Compiled by:

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BORJA HEREDIA (BirdLife International, U.K.) and
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Timetable

Workshop: November 1992 - Funchal, Madeira
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Reviews

This document should be reviewed and updated by BirdLife International every four years. An emergency review will be undertaken if sudden major environmental changes, liable to affect the population, occur within the species' range.

Geographical scope

Mainly the island of Bugio in the archipelago of the Desertas (Madeira, Portugal), but action is also to be undertaken in the other islands of the Desertas, especially Deserta Grande, and potentially, the Azores.

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SUMMARY

Background

Fea's Petrel *Pterodroma feae* is an extremely rare and threatened Macaronesian endemic petrel, known to exist only on Bugio and some of the Cape Verde Islands.

The first record of this petrel was of two specimens obtained by Dr Robert Frere from his correspondent in Madeira in 1853, though there is a specimen in the Natural History Museum (Tring, U.K.), collected in 1852, whose origin is uncertain. Fea's Petrel is almost impossible to distinguish at sea from Zino's Petrel *P. madeira*.

Not much is known about the population on the Cape Verde Islands, though there are estimates of a total population of up to 1,000 breeding pairs. In the Madeira archipelago it nests only on Bugio, and the greatest concentration is on the southern plateau of this island. A few nest on the northern plateau, but, as this is not accessible by foot and extremely difficult to reach even by helicopter, that area is almost impossible to study.

Over the years the birds have suffered predation by fishermen, but since the whole land surface of the Desertas were made a strict reserve this situation has improved dramatically.

The study of this bird is particularly important as it may well give very important insights to the life history of Zino's Petrel, whose status is precarious.

Threats and limiting factors

- * **Degradation of habitat due to overgrazing by goats and rabbits - high**
- * **Predation by Yellow-legged Gulls - unknown, potentially high**
- * **Disturbance caused by rabbits - unknown, potentially high**
- * **Human predation - low, historically high**

Conservation priorities

- * **Ensure continued financial support for the work on the Desertas from the EU - high**
- * **Removal of goats, rabbits and cats from Deserta Grande and Bugio - high**
- * **Biological studies including annual monitoring of the breeding population - high**
- * **Provide shelter facilities on Bugio for wardens and researchers - high**

INTRODUCTION

Fea's Petrel, also called Bugio Freira in Madeira and Gongon in the Cape Verde Islands, is considered to be a globally threatened species classified as Vulnerable in *Birds to Watch 2* (Collar *et al.* 1994). Previously, it was listed as Rare in the African Red Data Book (Collar & Stuart 1985) and in the *IUCN Red List of Threatened Animals* (Groombridge 1993). It is included in Annex I of the EU Wild Birds Directive and in Appendix II of the Bern Convention.

A very significant step towards the conservation of Fea's Petrel was the declaration in 1990 of the Nature Reserve of the Desertas Islands, which falls under the umbrella of the Natural Park of Madeira. Legal protection is effective now and human predation of the islands' seabirds has been halted through the wardening of the breeding colonies.

The real challenge is to manage the habitat in order to restore the natural conditions that existed on the Desertas prior to the arrival of man and domestic animals in 1420. This entails promoting the regeneration of the natural vegetation and thus enhancing its capacity to provide a breeding place for large numbers of seabirds. If this goal is achieved the Desertas will become one of the finest bird sanctuaries in the world.

This Action Plan is targeted at any organisations or individuals that wish to undertake conservation or research work in the area, and provides a technical framework for future management.

PART 1. BACKGROUND INFORMATION

Distribution and population

The only known place in Europe where Fea's Petrel breeds is on Bugio, southernmost island of the Desertas. The majority of burrows are to be found on the southern plateau, despite the fact that the northern plateau is more extensive, though more arid and with less vegetation (Zino & Zino 1986). On the basis of sub-fossil *Pterodroma* bones, the species is believed formerly to have bred on Deserta Grande, Porto Santo and the main island of Madeira (Pieper 1985). It seems increasingly likely that it breeds in the Azores (Bibby & del Nevo 1991). Outside Europe it breeds in the Cape Verde Islands, where the population is believed to be of 1,000 breeding birds or roughly 500 pairs (Hazevoet 1994).

The population on Bugio is considered to be around 150–200 breeding pairs and appears to be stable (Zino & Biscoito 1994).

Life history

* Taxonomic status

The species belongs to the gadfly-petrels *Pterodroma*, the largest group of tubenosed birds, with 25 species (Warham 1990). Within the gadfly-petrels it forms part of the Soft-plumaged Petrel complex, with two distinct forms in the North Atlantic, *feae* and *madeira*, and one, *mollis*, in the southern oceans (Bourne 1983).

Fea's Petrel was originally identified as *Pterodroma mollis* by Harcourt in 1855, then included in a distinct species, *P. feae*, by Salvadori in 1900, and then described as a dubious race *P. m. deserta* by Mathews in 1934 (Mathews 1934, W. R. P. Bourne *in litt.* 1993). More recently it has been proposed as a separate species under the name of *P. feae* (Bourne 1983). Zino and Zino (1986) showed that Fea's Petrel is heavier and considerably bigger, especially in bill size, than its relative Zino's Petrel *P. madeira*, and endorsed the proposal to treat this bird as a different species.

* Breeding

On Bugio, the birds return to their breeding grounds at about the end of June and laying starts about 20 July, with breeding activity reaching its peak during early August. Birds enter the breeding sites after dark and call loudly if there is no moon, falling silent when the moon rises (Zino & Zino 1986). The nesting burrows have varying entrance sizes and depths: the majority are more than 1 m in length and with an elbow, the nest-chamber being 30–60 cm below the surface (Zino & Zino 1986).

* Feeding

The species is essentially pelagic and highly adapted for living out of contact with land. Food is likely to consist of fish, cephalopods and crustaceans, often as plankton, but there is very little specific information available on diet and feeding behaviour. The birds can often be seen from the shore by day, flying and sometimes feeding.

* Habitat requirements

On the Desertas, Fea's Petrel breeds in areas where there is a thick layer of earth covered with grass and *Mesembryanthemum*. On and around the southern plateau of Bugio there are places with earth more than 1 m thick, and it is essential that a sufficient depth is available for the birds to construct burrows (Zino & Zino 1986).

Threats and limiting factors

* Availability of breeding grounds limited by habitat degradation

Bugio is heavily overgrazed by goats and rabbits, which are responsible for the loss of vegetation and the consequent soil erosion by wind and rain (Zino & Biscoito 1994). On Bugio, the main breeding grounds lie on the southern plateau. The northern plateau is very much larger, but there is much more erosion and less vegetation cover. It has also been suggested that regeneration of the flora would make the ground softer for the petrels to burrow into.

There is fossil evidence that Fea's Petrel was once dispersed more widely within the archipelago, for fossils have been found on Deserta Grande, Madeira and Porto Santo. Whether or not their disappearance from areas other than Bugio is due to alterations in the habitat is not known.

Importance: high

* **Disturbance by rabbits**

Rabbits are abundant on Bugio and have been shown to cause much disturbance to breeding burrows of *Pterodroma* species in New Zealand (invading and modifying burrows, digging new entrances and inter-connections), causing considerable stress to breeding pairs and resulting in the abandonment of breeding sites (Chappuis *et al.* 1994).

Importance: unknown, potentially high

* **Predation and disturbance by Yellow-legged Gulls**

The Yellow-legged Gull (*Larus cachinnans atlantis*) population in the Desertas has increased markedly, with some 500–700 pairs on Bugio and c.4,000 pairs on Ilhéu Chão.

There are also big colonies on the main island of Madeira. This is largely due to the poorly controlled dumping of rubbish in Madeira. In 1986 one netted Fea's Petrel was released at sea in daylight off Bugio; immediately a Yellow-legged Gull dived down from the cliffs above and attacked the bird, which managed to escape only with the greatest difficulty (Zino & Zino 1986). The gulls hunt by day and – more dangerously for Fea's Petrel – by night. Young birds that leave their burrow to exercise their wings are thus exposed to predation by them. Gulls are a problem throughout the archipelago; they have been observed taking Bulwer's Petrels on many occasions and hunting by moonlight (Zino & Biscoito 1994).

Importance: unknown, potentially high

* **Human predation**

Since the Desertas became a total land reserve this threat has been much reduced, but continued wardening is still of the utmost importance.

Importance: low, historically high

Conservation status and recent conservation measures

Fea's Petrel is classed as Vulnerable in the Portuguese Red Data Book (Cabral *et al.* 1990). It is a protected species in Portugal under Decreto-Lei 75/91. The establishment of the Nature Reserve of the Desertas Islands in 1990 was followed by an increase in wardening and surveillance. The reserve has been financed by the EU from the beginning. The island of Bugio is listed as an Important Bird Area (Grimmett & Jones 1989) and the Desertas have been designated as a Special Protection Area by the Portuguese Government under Article 4 of the EU Wild Birds Directive.

A survey of the breeding population has been carried out on a regular basis since 1967 through the mapping and recording of active burrows. Up to 1994, more than 400 birds have been ringed (F. Zino *in litt.* 1993).

In 1993 a feasibility study on the removal of problem animals from the islands of Madeira was carried out by Management International Ltd (New Zealand) at the request of BirdLife International (Bell 1993).

PART 2. AIMS AND OBJECTIVES

AIMS

To protect and maintain the breeding population of Fea's Petrel and to promote its expansion to all the available habitat on the island of Bugio and, eventually, to Deserta Grande.

OBJECTIVES

1. POLICY AND LEGISLATIVE

1.1. To ensure an adequate legal and financial framework for the conservation of threatened species in Portugal

1.1.1. Incorporate Species Recovery Plans into regional and national legislation

Recovery Plans are included as legal measures in other countries. Consideration should be given to incorporating the Action Plan for this species into appropriate legislation.

Priority: low

Time-scale: medium/long

1.1.2. Ensure continued financial support from the EU for the Desertas and that some funds are directed towards the conservation of this species

The management of the Nature Reserve of the Desertas Islands has received financial support from the EU during the period 1986–1996 through the ACNAT and LIFE programmes. A further application to the EU should be prepared to make sure that this funding continues in the future.

Priority: high

Time-scale: ongoing

1.1.3 *Develop and implement a strategy for addressing the issues affecting this species while at sea*

A Conservation Strategy for Birds of Marine Habitats in Europe is currently being prepared by BirdLife International, to be published in 1996. It will identify broad measures for the conservation of birds in their marine habitats, including Fea's Petrel in the Macaronesian Seas. This strategy should be used as a basis for additional actions for this species.

Priority: medium

Time-scale: ongoing

2. SPECIES AND HABITAT CONSERVATION

2.1. To improve conditions for the breeding birds by removing herbivores and predators

2.1.1. Undertake a feasibility study for the eradication of problem animals from Deserta Grande and Bugio

An assessment of the rabbit and goat populations on Deserta Grande and Bugio was made by Wildlife Management International Ltd in 1993. The rabbits are short of food and would be very susceptible to a poisoning campaign. Brodifacum, which is effective against rats, can be used against rabbits. Part of the terrain is easy but the cliff faces are a major challenge. The eradication of rabbits is a practical objective and could be achieved to 95% level in three months. Follow up spot poisoning and shooting would complete the task.

Goats were presumably introduced to the Desertas by seafarers to provide food for future visits. As on many oceanic islands, these introduced mammals now threaten the indigenous plants and animals. Overgrazing is leading to serious soil erosion and the majority of the indigenous flora is restricted to the inaccessible cliffs. Goat control should be carried out in combination with rabbit control; removal of just one species would lead to a population increase of the other.

Goat numbers are estimated by reserve wardens and local observers at 250 on Deserta Grande and 80 - 100 on Bugio. The islands have no woody cover so the goats are very vulnerable to shooting. Their only escape is to take to inaccessible cliffs, where they could still be shot from a helicopter.

Priority: high

Time-scale: COMPLETED

2.1.2. Pursue the eradication of rabbits, goats and cats from Deserta Grande

Following the recommendations of the feasibility study, a control programme should be carried out humanely and in a way which is compatible with the conservation of the seabirds and other species that exist in the island and surrounding waters. This programme should be managed by a specialist team under close supervision from the Nature Reserve. It is recommended that this starts with Deserta Grande, since access is easier and it offers accommodation facilities. Rabbit control would be beneficial not only to Fea's Petrel and other petrel species, but also to the flora of the island.

The small population of feral cats on Deserta Grande should be removed as soon as possible and certainly not later than the removal of the rabbits. If cats are not removed at this time it is likely that they will change from their present food source (rabbits) to others, such as birds and lizards.

Priority: high

Time-scale: short/medium

2.1.3. *Pursue the eradication of goats and rabbits from Bugio*

There is a population of about 80-100 goats on Bugio. Unlike the 'mixed bag' which is present on Deserta Grande, those on Bugio are all-black and appear to be different from the normal feral goats. They are rumoured to be of very old stock, and whilst this is doubtful, their origins are being investigated.

Priority: high

Time-scale: medium

2.1.4. *Explore potential destinations for relocated goats*

Some specimens should be taken into captivity before eradication, for research and tourist purposes. The possibility of sending some to other countries upon request should also be explored.

Priority: high

Time-scale: medium

2.1.5. *Develop a contingency plan for the accidental introduction or reintroduction of problem animals (particularly rats)*

The Natural Park of Madeira should prepare a contingency plan for use in emergencies (e.g. shipwrecks on the Desertas Nature Reserve) to prevent unwanted animals becoming established.

Priority: medium

Time-scale: short/medium

2.1.6. *Prevent the expansion of the Yellow-legged Gull population on the Desertas*

The population explosion of Yellow-legged Gulls over the last 10–15 years now poses a serious threat to Fea's Petrel and to other seabirds such as Bulwer's Petrel *Bulweria bulweri*. A culling programme should be started at the gull colonies of Ilhéu Chão and Bugio by narcotising birds and sterilising eggs.

Priority: medium

Time-scale: medium

2.2. **To prevent human disturbance and disruption to the breeding cycle**

2.2.1. *Wardening of breeding colonies*

The Desertas are already warded and this has significantly reduced the killing of seabirds by man. The presence of permanent wardens must be maintained and increased, under the auspices of the Natural Park of Madeira.

Priority: medium

Time-scale: ongoing

2.2.2. *Provide shelter facilities in Bugio*

It would be extremely useful to reconstruct the old whale lookout at Ponta da Agulha. This would provide shelter for the wardens during their missions and also for the researchers or other

visitors to the island. On the southern plateau of Bugio a small stone shelter would be very useful for work on Fea's Petrel. The existing facilities on Deserta Grande have proved to be essential for the wardening and management of the Nature Reserve.

Priority: high

Time-scale: medium

2.3. To promote the expansion of Fea's Petrel to other suitable areas in the Desertas

2.3.1. Enhance the regeneration of natural vegetation

The natural vegetation must be allowed to regenerate in order to build up enough soil to permit the digging of burrows by the petrels. Replanting of selected species native to the island should be done experimentally; seed or cuttings should be used wherever possible, but if this is not feasible then whole plants should be brought from the nearest source. In some areas supporting dry walls could be built up to slow down erosion and loss of topsoil.

Priority: low/medium

Time-scale: medium/long

2.3.2. Provide artificial burrows for breeding

An experiment should be undertaken to construct artificial burrows in selected areas on both Deserta Grande and Bugio after the rabbits have been removed. The artificial burrows should be carefully designed to fit the species' needs. Care needs to be taken not to cause disturbance or make the erosion problems worse.

Priority: medium

Time-scale: medium

3. MONITORING AND RESEARCH

3.1. To undertake an annual monitoring programme of the Fea's Petrel breeding population

3.1.1. Monitoring of breeding numbers and breeding success

Monitoring has been going on for several years and needs to be continued. Ideally, two surveys should be carried out annually, at the beginning and at the end of each breeding season. During the first survey the number of pairs that attempt to breed should be recorded by counting occupied burrows. The second survey serves to determine the breeding success, i.e. the number of fledged young. However, it is recognised that this may prove impracticable given the difficulty of the terrain. Maps should be made, at the appropriate scale, of the distribution of seabird breeding colonies on Bugio.

Priority: high

Time-scale: ongoing

3.1.2. *Monitoring the effectiveness of the habitat management experiments*

The areas where artificial burrows are made should be visited at the beginning of the breeding season to verify acceptance by Fea's Petrels or other species.

Priority: medium

Time-scale: medium/long

3.2. To evaluate the efficiency of the control programme for problem animals and to monitor the regeneration of vegetation

The process of eradicating goats and rabbits provides an excellent opportunity to follow the evolution of the ungrazed vegetation. Photographs from fixed points need to be taken to show the landscape before and after eradication. The whole process of vegetation recovery should be monitored with scientific accuracy. Wardens on Deserta Grande can maintain constant vigilance for rabbit and goat signs after the eradication campaign, and take appropriate action to remove any remaining animals. Specialists should pay annual visits to the island for two years following the main campaign.

Priority: medium

Time-scale: medium/long

3.3. To promote research initiatives which are of direct application for the conservation of Fea's Petrel

3.3.1. *Determine taxonomic status*

The relationships between the forms of *Pterodroma* from Bugio, the Cape Verde Islands and Madeira need to be clarified by means of the most recent taxonomic techniques, i.e. DNA fingerprinting or mitochondrial DNA analysis. This study has already started, but must be continued until some conclusions are reached and published.

Priority: low

Time-scale: ongoing

3.3.2. *Determine population dynamics and predict the species' capacity to expand and colonise new areas*

Ongoing studies on population dynamics should continue and be reported. Regular analysis of recapture data should enable the population to be assessed and monitored more precisely in the future.

Priority: low

Time-scale: medium

3.3.3. *Carry out searches of other potential breeding areas*

Recent records of the species from the Azores (Bibby & del Nevo 1991, Luis Monteiro *in litt.*) give some hope that new European colonies may be found. The University of the Azores is undertaking small-scale efforts to obtain further records under a seabird conservation project funded by the LIFE fund and RSPB. If this leads to significant further records, a larger, systematic survey should be carried out.

Priority: medium

Time-scale: medium

4. PUBLIC AWARENESS AND TRAINING

4.1. To increase the awareness of the Madeiran public of Fea's Petrel and the Desertas Nature Reserve, and to improve their attitude towards their conservation

4.1.1. *Launch a public relations campaign prior to the beginning of the programme to eradicate goats and rabbits*

A public relations campaign, accompanied by the production of suitable materials (leaflets, posters, etc), will be necessary to ensure that the reasons for the eradication programme are well understood. This is important to prevent local opposition to the eradication programme.

Priority: high

Time-scale: short/medium

4.1.2. *Increase public awareness*

The natural values of the Nature Reserve should be publicised and promoted, and the possibility of organised visits by boat for a limited number of people should be explored. A small interpretative centre about the archipelago of the Desertas should be set up either on Deserta Grande or in Madeira, including information on Fea's Petrel.

Priority: medium

Time-scale: medium/long

4.1.2 *Training of wardens*

The wardens should be given a more positive role than just policing. They should be trained to carry out monitoring, management and some of the technical aspects of research programmes.

Priority: medium

Time-scale: short/medium

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