

Pterodroma mollis

soft-plumaged petrel



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TASMANIAN THREATENED SPECIES LISTING STATEMENT

Common name: Soft-plumaged petrel

Scientific name: *Pterodroma mollis* Gould, 1844

Group: Vertebrate animal, bird, family **Procellariidae**

Status: *Threatened Species Protection Act 1995:* **endangered**

Environment Protection and Biodiversity Conservation Act 1999: **Vulnerable**

Distribution: Endemic status: **Not endemic to Tasmania**

Tasmanian NRM Regions (breeding locations): **South**

Tasmanian IBRA Regions (breeding locations): **TWE (Tasmanian West), SA (Macquarie Island)**

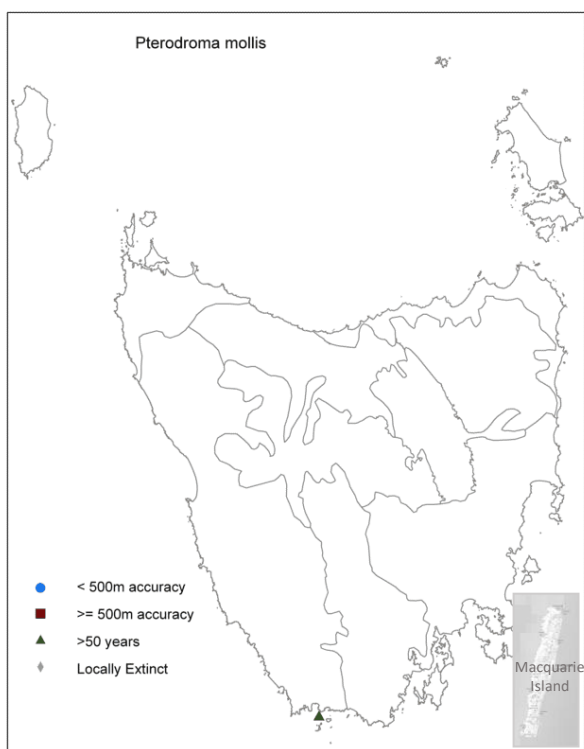


Figure 1. The breeding locations of the soft-plumaged petrel in Tasmania, including Macquarie Island (inset), showing IBRA regions



Plate 1. Soft-plumaged petrel adult (image © Georgina Steytler)

SUMMARY: The soft-plumaged petrel (*Pterodroma mollis*) is a pelagic, burrow-nesting seabird that breeds colonially on oceanic islands during the austral summer. The species is often seen in small groups flying near the surface of the water off southern Australia (Marchant & Higgins 1990; Reid et al. 2002). Globally, the species breeds on a number of islands in temperate and sub-Antarctic waters. In Australia, small breeding populations are present on Maatsuyker Island, southwest Tasmania (Wiltshire et al. 2004) and on sub-Antarctic Macquarie Island (DPIW 2007).

The biggest threat to soft-plumaged petrels is the introduction of mammalian predators to their breeding locations. The main objective for the species' management is to ensure protection of its habitat, particularly with regard to implementing and maintaining strict quarantine procedures for visitation to breeding islands.

IDENTIFICATION AND ECOLOGY

The soft-plumaged petrel (Plate 1) is a medium sized, burrow-nesting petrel (32-37 cm, 279-312 g) (Marchant & Higgins 1990). It has a whitish forehead with darker mottling, and a broad blackish eye-mark. The back is blue-grey, wings similar, but with dark brownish slate 'M' shaped band, and the tail is grey. The bill is black, and the legs are flesh-pink with black tipped webs (Pizzey & Knight 1999).

There have been no detailed studies of the biology and ecology of the soft-plumaged petrel across its global range. The species breeds colonially on offshore islands, loosely associated with other petrels in some locations, including Maatsuyker Island and Macquarie Island. Soft-plumaged petrels are nocturnally active at breeding locations.

Breeding occurs in burrows excavated among rocks and vegetation. A pair of soft-plumaged petrels prepares its burrow for nesting at the start of each season and the female lays a single egg each year. The breeding ecology of the species is not well understood, however, on Macquarie Island, birds have been observed flying around breeding sites from July and in burrows from August.

On Maatsuyker Island, adult birds have been recorded in burrows during September. Egg-laying probably occurs during mid to late December (with one Maatsuyker adult incubating on 12 December 2001, and another five adults incubating by 10 January 2002) (6 breeding pairs). Chicks have been recorded present until at least April, so it is likely that fledging occurs from late April onwards (Wiltshire et al. 2004).

Breeding success for the species in Australia is poorly known. For two seasons on Maatsuyker Island, four of six nests (67%) contained late-stage chicks in 2002 and three of five nests (60%) in 2003.

Brothers and Bone (2008) reported finding three burrows on Macquarie Island in the 1990s, and then stated that breeding was confirmed in 2006, however, no data on numbers were provided. A subsequent publication by Raymond et al. (2011) also referred to the soft-plumaged petrel being on Macquarie Island but did not provide information on numbers.

The life expectancy is considered to be around 15.6 years (BirdLife International 2011), with adults breeding from six years of age (Schreiber & Burger 2002). The soft-plumaged petrel diet consists mostly of cephalopods, some fish and crustaceans (Marchant & Higgins 1990).

Survey techniques

At-sea: For the soft-plumaged petrel, a standardised 10-minute count is usually employed at sea (Reid et al. 2002). The soft-plumaged petrel may be confused with other species at a distance. Similar species include the white-headed petrel *P. lessonii*, mottled petrel *P. inexpectata*, and grey petrel *Procellaria cinerea*. The rare dark morph closely resembles the Kerguelen petrel *Lugensa brevirostris* (Marchant & Higgins 1990). However, the combination of the dark grey underwing band and the grey breast band across white underparts should allow distinction at close inspection.

Breeding colonies: To assess burrow occupancy and breeding effort, a camera burrowscope may be useful (Dyer & Hill 1991) or a small hand-held camera if burrows are short.

The use of audio survey or DNA methods (using scats and feathers) provide alternative options for detecting activity and may reduce disturbance and the risk of burrow collapse at breeding sites.

On Maatsuyker Island, determining the presence of soft-plumaged petrels may be simplified by undertaking searches prior to the annual return (in late September) of the large breeding population of short-tailed shearwaters (*Ardenna tenuirostris*).

Taxonomic issues

There are scientific disagreements on the taxonomy of the soft-plumaged petrel *Pterodroma mollis*. The species limits are in dispute and the taxonomy of subspecies unresolved (Bretagnolle 1995). Two subspecies, *P. m. mollis* (breeding on Gough and Antipodes Island) and *P. m. dubia* (breeding on Amsterdam, Crozet, Kerguelen, Prince Edward and Marion Islands) are widely accepted. A third subspecies, *P. m. deceptornis* (on Amsterdam Island), which has a similar call to the Maatsuyker Island birds (Bretagnolle 1995), is rarely recognised. The Action Plan for Australian Birds 2010 tentatively ascribed records of the species breeding in Australia to *P. m. deceptornis* (Garnett, Szabo & Dutson 2011). However, using morphometric data and plumage descriptions, Wiltshire et al. (2004) were unable to conclude which subspecies was breeding on Maatsuyker Island due to the lack of consensus and clarity with the subspecific groupings. Further research, including molecular analyses, is required to clarify the taxonomic relationships within the soft-plumaged petrel group (Wiltshire et al. 2004). Therefore, the Action Plan for Australian Birds 2010 and the Threatened Species Scientific Committee (TSSC) consider the whole species as one entity (Garnett et al. 2011; TSSC, 2015).

Confusing species

Similar species include the white-headed petrel, although the soft-plumaged petrel is smaller. At breeding locations in areas with mixed species, determining the species that occupy long burrows may be difficult.

DISTRIBUTION AND HABITAT

The soft-plumaged petrel is generally found over temperate and subantarctic waters in the South Atlantic, southern Indian and western South Pacific Oceans (Marchant & Higgins 1990). Globally, the species breeds on several islands including Gough Island, Tristan da Cunha, Inaccessible Island, Nightingale Island (South Atlantic); Iles Crozet, Prince Edward Islands, Marion Island, Amsterdam Island, Iles Kerguelen (Indian Ocean), and on Antipodes Island in the New Zealand sub-Antarctic (Bretagnolle 1995). The closest known breeding population to Australia is ~2500 km to the east on Antipodes Island (49°41'S, 178°45'E) where several thousand pairs are estimated to breed (Taylor 2000). To the west of Australia, the closest breeding population is on the Kerguelen Islands (49°14'S, 69°26'E) ~5700 km away (Weimerskirch et al. 1989).

In 2001-02, a small colony of soft-plumaged petrels was confirmed breeding on Maatsuyker Island (43°39'S, 146°16'E), a 186 ha island situated 13 km south of the Tasmanian mainland (Wiltshire et al. 2004). This was the first confirmed breeding record of this species in Australia. In 2006-07, small numbers were first recorded breeding on sub-Antarctic Macquarie Island (54°30'S, 158°57'E), a 12 800 ha island lying 1500 km south of Tasmania (DPIW 2007).

The soft-plumaged petrel is a marine, oceanic species. This species is highly pelagic and rarely approaches land, except at breeding colonies. Breeding starts in September in colonies on oceanic islands. Breeding sites occupy steep slopes with tussock grass or ferns, usually along the coast but also inland with pairs nesting in long burrows (Marchant & Higgins 1990). On Maatsuyker Island, breeding burrows occur within the edge of *Leptospermum scoparium* scrub and on steep slopes covered with *Senecio pinnatifolius* and the succulents *Tetragonia implexicoma*, and *Rhagodia candolleana* (Wiltshire et al. 2004) (Plate 2).

Soft-plumaged petrels are dispersive or migratory from breeding islands, but their movements during the non-breeding season are poorly documented (Marchant & Higgins 1990).

The species is typically present in south-eastern Australian waters between September and April but appear absent during the winter months (Reid et al. 2002).



Plate 2. Soft-plumaged petrel habitat, Maatsuyker Island (image by S. Hamilton)

POPULATION PARAMETERS

The breeding population size of soft-plumaged petrels in Australian territory is unknown. The species breeds at only two sites: on Maatsuyker Island off Tasmania (Wiltshire et al. 2004) and on Macquarie Island (DPIW 2007) (Table 1). The Action Plan for Australian Birds 2020 estimated the Australian breeding population to be 50–250 mature individuals with <50 on Maatsuyker Island and an increasing but small number on Macquarie Island (Garnett & Baker *in press*).

The population on Maatsuyker Island is very small, with seven breeding burrows, equating to 14 individuals utilising the island in 2001-03 (Wiltshire et al. 2004).

The first breeding record for Macquarie Island was in 2006-07 when two separate chicks and one broken egg were identified (DPIW 2007). Audio surveys and spotlighting undertaken between July-September 2003 estimated up to 42 breeding or prospecting adults (TSU 2004).

Soft-plumaged petrels are difficult to locate as they are nocturnal when on land, nest in burrows, and there are large numbers of other burrow-nesting seabird species on both Maatsuyker Island (Wiltshire et al. 2004) and Macquarie Island.

The population status of the soft-plumaged petrel at Maatsuyker Island and at Macquarie Island is also unknown. Both populations are likely to be small with very small areas of occupancy. It is not known whether this species always bred on Maatsuyker Island and remained undetected or whether the discovery represented a new colonisation or re-colonisation for the species (Wiltshire et al. 2004). It has been suggested that introduced predators on Macquarie Island led to the extermination of the soft-plumaged petrel population and that recolonising attempts observed since 1982 (Brothers 1984) have only been successful following concerted pest eradication efforts.

The global population is estimated at five million mature individuals (BirdLife International 2018). The largest populations occur on Gough Island (1–10 million pairs) and the Crozet Islands (30 000–50 000 pairs) (Shirihai 2002).

The area of occupancy of the Australian breeding population has been previously estimated as 8 km², although there is low reliability in this estimate. The extent of occurrence is estimated to be 3 000 000 km² based on the distance between the two, small breeding locations (Garnett & Baker *in press*).

The Action Plan for Australian Birds 2020 has downlisted the conservation status of the species from Critically Endangered to Vulnerable in Australian territory because although the Australian breeding population almost certainly contains fewer than 250 mature individuals, they are demonstrably not genetically isolated from a much larger global population of Least Concern. Threats have also been removed from Macquarie Island and the population is now larger and suspected to be increasing (Garnett & Baker *in press*).

RESERVATION STATUS

Both breeding locations in Australia are fully protected. Maatsuyker Island is part of the Southwest National Park and Tasmanian Wilderness World Heritage Area. Macquarie Island is a UNESCO World Heritage Site.

Table 1. Population summary for the soft-plumaged petrel.

	Location	Tenure	NRM region*	1:25 000 mapsheet	Year last (first) recorded	Abundance
1	Maatsuyker Island	Southwest National Park, Tasmanian Wilderness World Heritage Area	South	De Witt	2007-08 (2001-02)	Unknown (at least 7 breeding pairs)
2	Macquarie Island	Macquarie Island World Heritage Area	South	De Witt	2015-16 (2006-07)	Unknown (at least 3 breeding pairs)

*NRM region = Natural Resource Management region

Macquarie Island is also protected under Tasmanian legislation as a Nature Reserve and is on the National Heritage List, thereby providing additional protection under the *Environment Protection and Biodiversity Conservation Act 1999*.

CONSERVATION STATUS

The soft-plumaged petrel meets the criteria for listing as Endangered on the *Threatened Species Protection Act 1995*, specifically criteria B1 and B3 (Extent of occurrence), and D1 (Total population size small).

The species has a severely fragmented distribution, is known to exist at no more than five locations, and has a total population estimated to number fewer than 2,500 mature individuals with no subpopulation estimated to contain more than 250 mature individuals.

THREATS, LIMITING FACTORS & MANAGEMENT ISSUES

Introduction of predators to breeding locations: Feral cats *Felis catus* and great skuas *Catharacta skua* are major predators of the soft-plumaged petrel on Marion Island, with cats also impacting the populations on Kerguelen, Crozet, and Amsterdam Islands (Garnett & Crowley 2000; Marchant & Higgins 1990). Rats (*Rattus* spp.) also prey upon this species on Iles Crozet (Marchant & Higgins 1990).

The accidental introduction of predators has been identified as a potential threat to the small breeding population on Maatsuyker Island (Wiltshire et al. 2004, (Garnett, Szabo & Dutson 2011).

Introduced predators, including feral cats, rats, (*Rattus rattus*) and weka (*Gallirallus australis*), may have been responsible for the absence of the soft-plumaged petrel from Macquarie Island in the past (Brothers 1984).

Eradication programs for weka, feral cats, rabbits, rats and mice have removed all invasive alien mammals from Macquarie Island with the island declared free of mammalian pests in 2014. Following these invasive species eradication efforts, the first confirmed breeding record for soft-plumaged petrel on Macquarie Island occurred in 2006-07 (DPIW 2007).

Habitat damage: Habitat destruction caused by human visits to colony sites is identified as a potential threat to the small breeding population on Maatsuyker Island (Wiltshire et al. 2004).

Stochastic risk: The small size and low number of populations expose the soft-plumaged petrel to a stochastic risk of extinction.

At-sea potential threats: Soft-plumaged petrels are potentially at risk from mortality in fishing operations and marine pollution (DSEWPaC 2012, 2015):

Climate change: Soft-plumaged petrels are potentially at risk from changes in sea temperature, changes in oceanography and ocean acidification due to climate change, all of which may alter the food resource of this species (DSEWPaC 2012, 2015).

MANAGEMENT STRATEGY

Management objectives

The main objective for the management of the soft-plumaged petrel is to ensure protection of land-based breeding habitat, particularly with regard to implementing and maintaining strict quarantine procedures for visitation to breeding islands.

Any emerging threats that are likely to have an immediate impact on this species, particularly to breeding and foraging habitat, need to be identified and appropriate responses developed.

What has been done?

The Recovery Plan for Ten Species of Seabirds 2005-2010, including soft-plumaged petrels, was developed but has since sunsetted (DEH 2005).

There was annual monitoring of the breeding burrows on Maatsuyker Island from 2001-02 to 2007-08. Monitoring of breeding locations on Macquarie Island is conducted annually.

What is needed?

- Strict quarantine procedures should be maintained on both Maatsuyker and Macquarie islands to reduce the risk of any invasive species (re)establishing on the islands;
- Monitoring of numbers of breeding pairs on Macquarie Island and Maatsuyker Island. However, note that while population information and trend data is desirable for breeding locations in Australia, collection of data needs to be weighed against the risk of disturbance to breeding sites;
- Determine the taxonomic status of soft-plumaged petrels breeding on Maatsuyker Island and Macquarie Island.

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- Permit:** A permit is required under the *Tasmanian Threatened Species Protection Act 1995* to knowingly “take” (which includes kill, injure, catch, damage, destroy and collect), keep, trade in or process any specimen of a listed species.