NSW SCIENTIFIC COMMITTEE

Gould's Petrel *Pterodroma leucoptera leucoptera*

Review of Current Information in NSW

July 2008

Current status:

Gould's Petrel *Pterodroma leucoptera leucoptera* is currently listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). The NSW Scientific Committee recently determined that Gould's Petrel meets criteria for listing as Vulnerable under the NSW *Threatened Species Conservation Act* 1995 (TSC Act), based on information contained in this report and other information available for the subspecies.

Species description:

The following description was taken directly from Marchant & Higgins (1990):

"Adult. Forehead white but freckled with black, merging into sooty brown to sooty black crown and nape. Dark crown- and nape-feathers extend forward to join very dark, suborbital patch, making sides of face appear blackish, contrasting strongly with white area at base of bill. Upperwing, dark brownish-grey; dark primaries and greater coverts form indistinct open M-mark linked across lower back Primaries, brown-black with white wedge at base of inner webs. Secondaries, grey with white inner webs. Mantle and back, blue-grey to dark grey; rump and upper tail-coverts, darker. Tail, grey tinged with brown, darkening at tip. Outermost tail-feather has inner web grey to brownish grey, except for off-white basal half. Chin, lores and rest of underparts, white, although dark-grey feathers extend from nape to form large patch on sides of breast and rarely may almost form a collar across throat. Underwing, white with dark remiges and dark leading-edge to outerwing, angling in at carpal joint to form prominent blackish diagonal carpal bar across secondary coverts. This underwing bar much more pronounced than in Stejneger's *P. longirostris*, which is otherwise similar; Cook's *P. cookii*, and Pycroft's *P. pycrofti* Petrels also have much less black on underwing but are pale-headed; pattern is less extensive than in Black-winged *P. nigripennis*, Chatham *P. axillaris* and Bonin *P. hypoleuca* Petrels. Bill black. Iris, dark brown, Legs and feet and upper webs, off-white; toes, joints, lower webs and claws, dull black."

Taxonomy:

Gould's Petrel is one of the gadfly petrels and is one of three currently recognised subspecies of *P. leucoptera*. The subspecies are all morphologically similar and as far as is known have similar general breeding habits. The two non-Australian subspecies, the Collared Petrel *P.l. brevipes* and New Caledonian Petrel *P.l. caledonensis*, occur in Fiji and New Caledonia respectively. Other close relatives include Cook's Petrel *P. cookii*, Stejneger's Petrel *P.*

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longirostris longirostris and Pycroft's Petrel *P. l. pycrofti* (Marchant & Higgins 1990; DEC 2006b).

When John Gould first described this petrel in 1844 (Gould 1944) he named it *Procellaria leucoptera* and later *Procellaria cookii* (he believed at the time *leucoptera* and *cookii* to be the one species) (Hindwood & Serventy 1941).

Other common names for *P.l. leucoptera* include White-winged Fulmar or Petrel, White-throated Petrel and Sooty-capped Petrel. The name 'Gould's' was preferred as other common names were not distinctively descriptive and Gould's was the most commonly used (W. B Alexander in Hindwood & Serventy 1941).

Distribution and number of populations:

At sea, the distribution of *P.l. leucoptera* is unknown but believed to include sub-Antarctic waters between Macquarie Island and Tasmania (Observational data, Australian Antarctic Division 2001). Breeding sites are limited to two islands at the entrance to Port Stephens on the mid-north coast of New South Wales (Priddel & Carlile 1997a) (Figure 1). The main breeding site is Cabbage Tree Island (John Gould Nature Reserve). A smaller population occurs on Boondelbah Island, 1.4 km to the south. The existence of other breeding sites is unlikely due to specific requirements for nesting (rock scree on offshore islands) (expert advice 2008).

Cabbage Tree Island (John Gould NR) and Boondelbah Island are both gazetted Nature Reserves under the *National Parks and Wildlife Act* 1974 (NPW Act). As such, the subspecies habitat is protected from land uses incompatible with nature conservation. Cabbage Tree Island was declared Critical Habitat for the species in 2006 under the TSC Act (DEC 2006a). Public access is restricted at both breeding islands.

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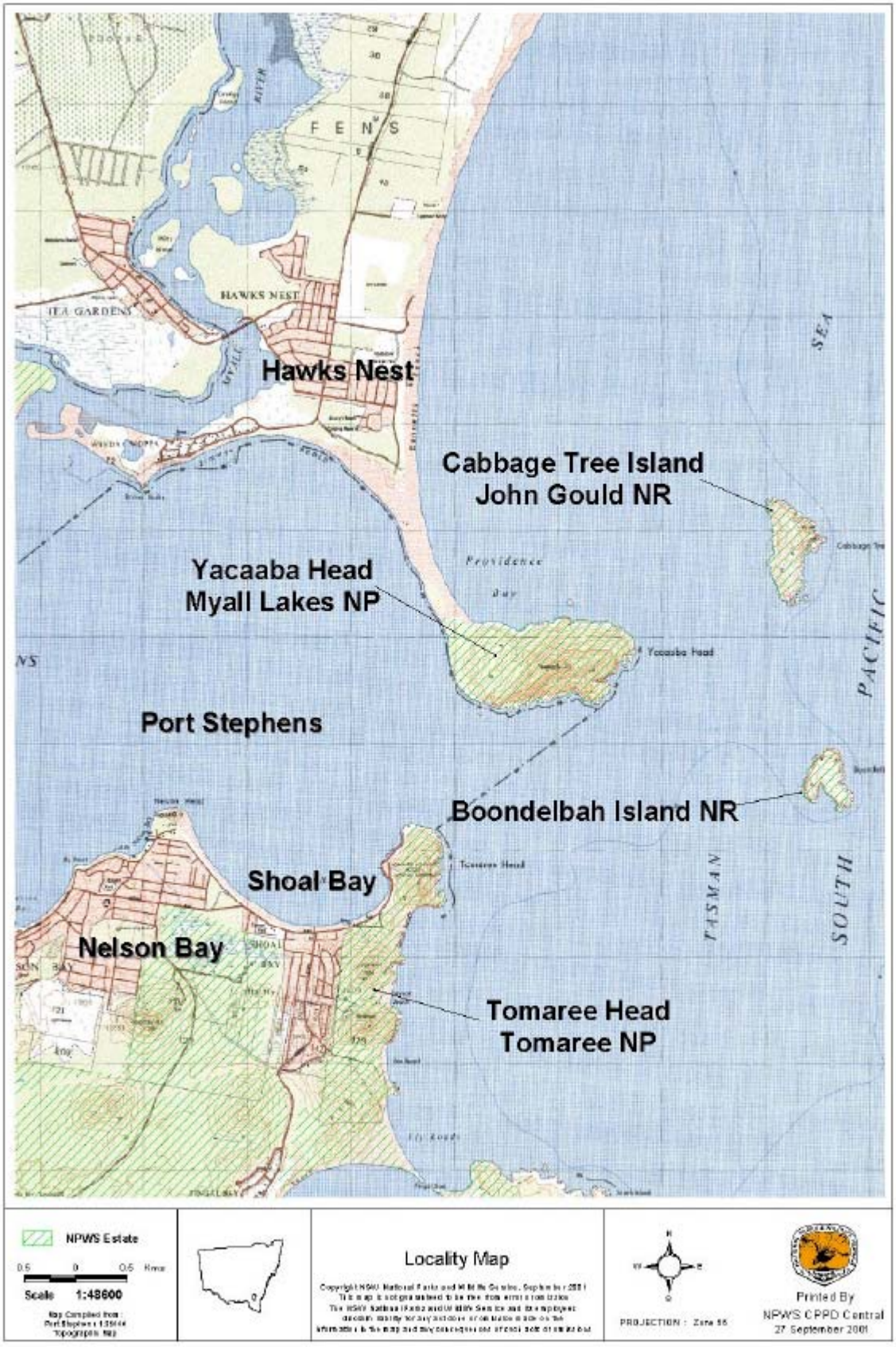

Figure 1. Locality of Gould's Petrel breeding sites (Source: DEC 2006b).

Ecology:

Key habitat requirements

The nesting habitat of Gould's Petrel is characterised by steeply sloping rock scree and a canopy of *Livistona australis* (Cabbage Tree Palm), *Ficus superba* (Deciduous Fig), *F. fraseri* (Sandpaper Fig), and *Planchonella australis* (Native Plum). Gould's Petrel is also known to utilise hollow fallen palm trunks, under mats of fallen palm fronds and in cavities among the buttresses of fig trees (DEC 2006b).

Life history

Gould's Petrel is a colonial breeder with nests often clumped less than 1 m apart (D'Ombrain 1943). The subspecies is monogamous and pair bonds appear to be longstanding and use the same nest site year after year (Priddel *et al.* 2006).

During mid to late September the birds arrive on the islands to breed. Birds lay eggs usually over a six week period starting in early November. A single egg is laid, which is not replaced if lost. Incubation takes 49 days, with each parent taking shifts of around 16 - 17 days. The chick is brooded for one or two days. Both parents then share the responsibility of feeding the chick. The young remain in the nest for about 13 weeks, achieving weights of around one and a half times that of their parents. Fledglings depart the island from late March to early May. It is believed that young birds remain at sea for several years (DEC 2006b).

Generation length

Age at first breeding is typically five to six years (range 3 – 11 years, n = 90) (Priddel *et al.* in prep.). Currently 170 known-age breeding birds are being monitored, some for in excess of 10 years. The oldest known breeder, originally banded as a breeding adult, is 36 years (Priddel *et al.* in prep) and represents the extent of the records available, rather than maximum reproductive age. Generational length (IUCN 2008), for the subspecies is calculated at approximately 20 years.

Number of mature individuals:

Historical information pertaining to size of the population is scant and imprecise. When Gould first described this species, from a Cabbage Tree Island specimen, no estimation of population size was given, but he reported that the subspecies was "breeding in great numbers". In 1970 the first assessment of abundance was made when the Cabbage Tree Island population was estimated at about 2 000 individuals (Fullagar 1976). Surveys conducted from 1989 to 1992 estimated the annual average number of breeding pairs to be 220 (Priddel *et al.* 1995) (Figure 2). Recovery actions undertaken since 1993 have resulted in the total number of mature individuals increasing steadily. The current estimated number of breeding pairs on Cabbage Tree Island is between 800 and 1 000 pairs, and increasing (Priddel & Carlile 2007).

The second breeding colony on Boondelbah Island was discovered in 1992 and estimated to contain 12 nesting pairs (Priddel & Carlile 1997a). A translocation program was undertaken in

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1999 to increase the numbers of Gould's Petrel on Boondelbah Island to ensure a viable breeding population (Priddel & Carlile 2001).

One hundred Gould's Petrel chicks were translocated from Cabbage Tree Island to Boondelbah Island in March 1999. They were placed into artificial nest boxes and 95% of the chicks fledged and left the island in the following months. In March 2000, a further 100 chicks were translocated and all successfully fledged. By 2003-2004 ten translocated birds had returned to Boondelbah Island and six of these successfully bred (Priddel *et al.* 2006). Offspring from this second generation of translocated birds have now been recorded (expert advice, 2008). The number of individuals breeding on Boondelbah Island is currently around 30-40 pairs (expert advice, 2008).

The current total number of mature individuals of Gould's Petrel is estimated to be 1 650 to 2 100 (expert advice, 2008).

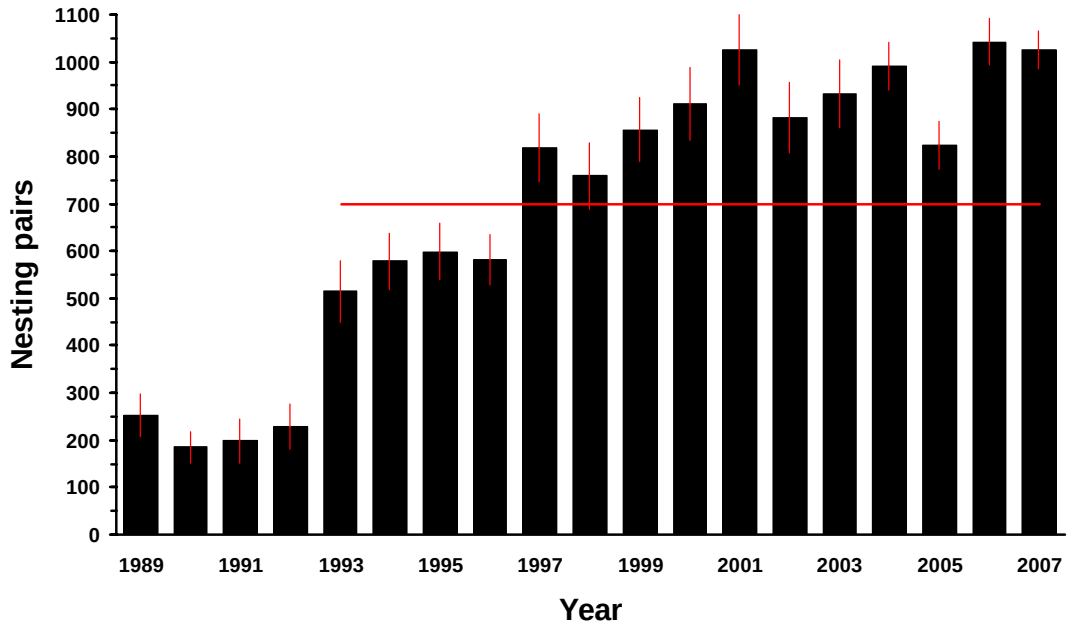

Figure 2: Number of nesting pairs of Gould's Petrel on Cabbage Tree Island 1989 – 2007 (Priddel & Carlile unpublished data).

Threats:

At-sea threats to Gould's Petrel are unknown, however, a decline in breeding success and fledgling production in 1995-96 was coincidental with a major fish kill in eastern Australia (Priddel & Carlile 1997b). Potential land-based threats on Cabbage Tree Island including, predation by Pied Currawong *Strepera graculina* and Australian Raven *Corvus coronoides* and entanglement in the sticky fruits of the *Pisonia umbellifera* (Birdlime Tree), are subject to

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ongoing mitigation measures (DEC 2006b). Habitat decline on Cabbage Tree Island was arrested after the eradication of rabbits in 1997 (Priddel *et al.* 2000). The establishment of a second population, on Boondelbah Island, has further safeguarded the subspecies (Priddel *et al.* 2006). There are no known threats to the Boondelbah Island population (expert advice, 2008).

Despite significant conservation efforts, the Gould's Petrel remains threatened by stochastic events because of its restricted distribution. The close proximity of breeding islands to urban areas on the mainland also puts these petrels at risk of human impacts such as vandalism, fire or introduction of pest species.

Long-term threats include climate change, fire and potential non-regeneration of rainforest habitat (expert advice, 2008).

Extreme fluctuations:

There is no evidence of extreme fluctuations in the population size or habitat of Gould's Petrel.

Population reduction and continuing declines:

The analysis of mark-recapture data collected before the implementation of management actions on Cabbage Tree Island, suggests the population had experienced a decline of at least 26% between 1970 and 1992 (although these data and the methodology were not considered robust) (Priddel *et al.* 1995).

The main cause of this decline appears to have been predation by Pied Currawongs and Australian Ravens and entanglement of petrels in seeds of *P. umbellifera* (Priddel & Carlile 1995, Priddel *et al.* 1995). Following the control of currawongs and ravens, and removal of *P. umbellifera,* there was a rapid increase in the number of breeding birds and the number of young fledged (Priddel & Carlile 1995, 1997a).

It is likely that Gould's Petrel became more vulnerable to these threats as a result of the introduction of rabbits to the island in 1906 which reduced the amount of available cover (Werren & Clough 1991, Priddel & Carlile 1997a). In addition, currawong numbers on the adjacent mainland were believed to have increased after the urbanisation of the coastal areas from about the 1950's (expert advice, 2008).

Population numbers and breeding success have shown an upward trend since management actions were instigated in 1992. The population has increased steadily by an average of 37 pairs annually (Priddel & Carlile 2007). In recent years breeding success (number of known eggs to produce fledglings) has averaged 49.4% (range 46.1 to 58.6%) and fledgling production exceeds 320 individuals annually. Between 1993–1994 and 2005–2006 fledgling production has increased steadily on average by about 18 fledglings per year (Priddel & Carlile 2007).

Gould's Petrel, however, is restricted to a very small number of breeding sites and is at high risk of stochastic events and human induced impacts (such as fire and the introduction of pest species). Consequently, the subspecies will always be threatened by stochastic events.

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Extent of Occurrence (EOO) & Area of Occupancy (AOO):

The at-sea distribution is unknown but believed to extend as far south as sub-Antarctic waters between Macquarie Island and Tasmania (Observational data, Australian Antarctic Division 2001). Beach washed specimens and sightings at sea extend as far north as the Queensland border and as far west as Eyre on the Western Australian south coast (Marchant & Higgins 1990). It appears that the subspecies forages predominantly within the Tasman Sea (DEC 2006b).

The breeding islands are small, 30ha (Cabbage Tree Island) and 15ha (Boondelbah Island).

The Extent of Occurrence (EOO, IUCN 2008) and Area of Occupancy (AOO, IUCN 2008) for Gould's Petrel are both calculated to be less than 8 km^2.

Severe fragmentation:

There is no evidence that the population or habitat of Gould's Petrel is severely fragmented.

References:

Department of Environment and Conservation (NSW) (2006a) 'Declaration of critical habitat for Gould's Petrel *(Pterodroma leucoptera leucoptera)* (Pursuant to sections 44 and 47 of the Threatened Species Conservation Act 1995).' Department of Environment and Conservation (NSW), Hurstville, NSW.

Department of Environment and Conservation (NSW) (2006b) 'Gould's Petrel *(Pterodroma leucoptera leucoptera* Recovery Plan.' Department of Environment and Conservation (NSW), Hurstville, NSW.

D'Ombrain AF (1943) The Cabbage Tree Island colony in the 1941-42 season. *Emu* **42**, 156-159.

Fullagar PJ (1976) Seabird islands No. 35: Cabbage Tree Island, New South Wales. *Australian Bird Bander* **14**, 94-7.

Gould J (1844) *Procellaria leucoptera*. *Annals and Magazine of Natural History* **13**, 364.

Hindwood KA, Serventy DL (1941) The Gould petrel of Cabbage Tree Island. *Em*u **41**, 1-20.

IUCN (2008) 'Guidelines for using the IUCN Red List Categories and Criteria. Version 7.0.' (Standards and Petitions Working Group of the IUCN Species Survival Commission Biodiversity Assessments Sub-committee: Switzerland). (http://intranet.iucn.org/webfiles/doc/SSC/RedList/RedListGuidelines.pdf).

Marchant S, Higgins PJ (1990) 'Handbook of Australian, New Zealand and Antarctic Birds, Vol. 1A.' (Oxford University Press: Melbourne)

Priddel D, Carlile N (1995) Mortality of adult Gould's Petrels *Pterodroma leucoptera leucoptera* at the nesting site on Cabbage Tree Island, New South Wales. *Emu* **95**, 259-64.

Contact Address: C/o PO Box 1967 Hurstville BC NSW 1481 Telephone: (02) 9585 6940 Facsimile: (02) 9585 6989

Priddel D, Carlile N (1997a) Boondelbah Island confirmed as a second breeding locality for Gould's Petrel *Pterodroma leucoptera leucoptera*. *Emu* **97**, 245-8.

Priddel D, Carlile N (1997b) Conservation of the endangered Gould's Petrel *Pterodroma leucoptera leucoptera*. *Pacific Conservation Biology* **3**, 322-29.

Priddel D, Carlile N (2001) A trial translocation of Gould's Petrel (*Pterodroma leucoptera leucoptera*). *Emu* **10**, 79-88.

Priddel D, Carlile N (2007) Population size and breeding success of Gould's Petrel *Pterodroma leucoptera leucoptera*, on Cabbage Tree Island, New South Wales 1996-97 to 2005-06. *Corella* **31**, 79-82.

Priddel D, Carlile N, Davey C, Fullagar PJ (1995) The status of Gould's Petrel, *Pterodroma leucoptera leucoptera*, on Cabbage Tree Island, New South Wales. *Wildlife Research* **22**, 601-10.

Priddel D, Carlile N, O'Neill L (in prep) An analysis of banding returns of Gould's Petrel *Pterodroma leucoptera leucoptera*, on Cabbage Tree Island, New South Wales.

Priddel D, Carlile N, Wheeler R (2000) Eradication of European rabbits (*Oryctolagus cuniculus*) from Cabbage Tree Island, NSW, Australia, to protect the breeding habitat of Gould's petrel (*Pterodroma leucoptera leucoptera*). *Biological Conservation* **94**, 115-25.

Priddel D, Carlile N, Wheeler R (2006) Establishment of a new breeding colony of Gould's petrel (*Pterodroma leucoptera leucoptera*), through the creation of artificial nesting habitat and the translocation of nestlings. *Biological Conservation* **128**, 553-63.

Werren GL, Clough AR (1991) Effect of rabbit browsing on littoral rainforest, Cabbage Tree Island, New South Wales-with special reference to the status of the Gould's Petrel. In 'The Rainforest Legacy: Australian National Rainforests Study, Vol 2-Flora and Fauna of the Rainforests' (Eds G Werren and P Kershaw) pp. 257-77. (Australian Government Publishing Service: Canberra.)

Explanatory note

Between 2007 and 2009 the NSW Scientific Committee undertook a systematic review of the conservation status of a selection of plant and animal species listed under the Threatened Species Conservation Act. This species summary report provides a review of the information gathered on this species at the time the Review was undertaken.

The Scientific Committee's report on the Review of Schedules project and final determinations relating to species that were either delisted or had a change in conservation status can be found on the following website: www.environment.nsw.gov.au .

The Committee gratefully acknowledges the past and present Committee members and project officers who ably assisted the Committee in undertaking the Review of Schedules Project. Information on the people involved in the project can be found in the Acknowledgement section of the project report entitled "Review of the Schedules of the Threatened Species Conservation Act 1995. A summary report on the review of selected species" which is available on the abovementioned website.

This species summary report may be cited as:

NSW Scientific Committee (2008) Gould's Petrel *Pterodroma leucoptera leucoptera*. Review of current information in NSW. July 2008. Unpublished report arising from the Review of the Schedules of the Threatened Species Conservation Act 1995. NSW Scientific Committee, Hurstville.

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