Tristan Albatross
Diomedea dabbenena

Albatros de Tristan
Albatros de Tristan

CRITICALLY ENDANGERED | ENDANGERED | VULNERABLE | NEAR THREATENED | LEAST CONCERN | NOT LISTED

Sometimes referred to as
Wandering Albatross

Photo © R. Wanless & A. Angel

TAXONOMY

Order Procellariiformes
Family Diomedeidae
Genus *Diomedea*
Species *D. dabbenena*

The Tristan Albatross *Diomedea dabbenena* was first recognised as a separate species by Mathews (1929), being sister taxon to the Wandering albatross *D. exulans* (Linnaeus, 1758). There was much debate around the taxonomy of *Diomedea* in the 20th century and the genus is presently reserved for the great albatrosses (Wandering and Royal Albatross complexes) [1]. The taxonomic reshuffling culminated in the designation of the super-species complex *D. exulans*, comprised of several subspecies including *dabbenena*. In 1998, *D. exulans dabbenena* was raised to full species status based on genetic, morphological and other character differences [2, 3, 4] and this has since gained wide acceptance, including by ACAP [5].

CONSERVATION LISTINGS AND PLANS FOR THE SPECIES

International

- Agreement on the Conservation of Albatrosses and Petrels – Annex 1 [5]
- 2008 IUCN Red List of Threatened Species – Critically Endangered (since 2008) [6]
- Convention on Migratory Species - Appendix II (as *Diomedea exulans*) [7]

Australia

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC ACT)* [8]
  - Endangered
  - Migratory Species
  - Marine Species
- Recovery Plan for Albatrosses and Petrels (2001) [9]
- Threat Abatement Plan 2006 for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations [10]

Brazil

- National Species List of Brazilian Fauna Threatened with Extinction (*Lista Nacional das Espécies da Fauna Brasileira Ameaçadas de Extinção*) [11]
  - Endangered

South Africa

- *Sea Birds and Seals Protection Act, 1973 (Act No. 46 of 1973) (SBSPA)* [12]
- *Marine Living Resources Act (Act No. 18 of 1996)*: Policy on the Management of Seals, Seabirds and Shorebirds: 2007 [13]
- National Plan of Action (NPOA) for Reducing the Incidental Catch of Seabirds in Longline Fisheries 2008 [14]

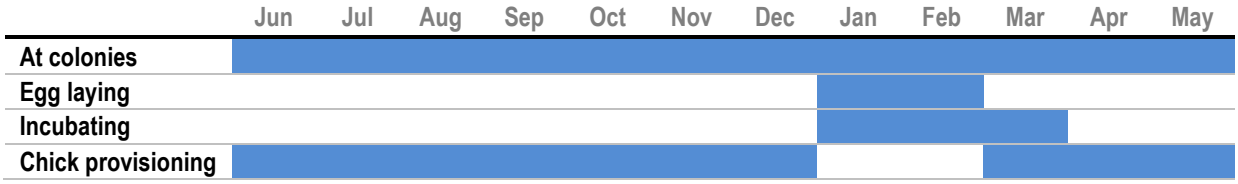
Tristan da Cunha, UK Overseas Territories

- *The Conservation of Native Organisms and Natural Habitats (Tristan da Cunha) Ordinance 2006* [15]

BREEDING BIOLOGY

Diomedea dabbenena is a colonial, biennially breeding species; each breeding cycle typically lasts 12 months. Eggs are laid in January-February (exceptionally in late December), hatch in March-April and the chicks fledge in November-January, after spending 8-9 months on the nest (Table 1) [16]. Immature birds begin returning to their breeding colony at 3-7 years after fledging. Most *D. dabbenena* recruit in their natal colony, at a mean age of 10 years (range 4-20 years) [17].

Table 1. *Breeding cycle of* D. dabbenena.



BREEDING STATES

Table 2. *Distribution of the global* D. dabbenena *population among Parties to the Agreement that have jurisdiction over the breeding sites of ACAP-listed species.*

	Argentina	Australia	Chile	Ecuador	France	New Zealand	South Africa	United Kingdom
Breeding pairs	-	-	-	-	-	-	-	100%

BREEDING SITES

Diomedea dabbenena is endemic to Tristan da Cunha (Table 2) with extant colonies on only two islands: Gough Island and Inaccessible Island (Figure 1). The Inaccessible Island colony is not considered viable as it continues to decline and has produced fewer than one chick per year since the 1990s [18]. Thus Gough Island effectively holds the entire global breeding population. The total annual breeding population is approximately 1,700 pairs (Table 3) and the total population numbered about 11,000 individuals in 2007 [17].

Table 3. Monitoring methods and estimates of the population size (annual breeding pairs) for each breeding site. Table based on Wanless 2007 [17] and unpublished R. Wanless and J. Cooper data.

Breeding site location	Jurisdiction	Years monitored	Monitoring method	Monitoring accuracy	Breeding pairs (last census)
Gough 40° 21'S, 009° 53'W	United Kingdom	2001, 2004-2008	A (100%)	High	1,763 (2008)
Inaccessible 37° 19'S, 012° 44'W	United Kingdom	2004, 2009	A (100%)	High	0 (2009)

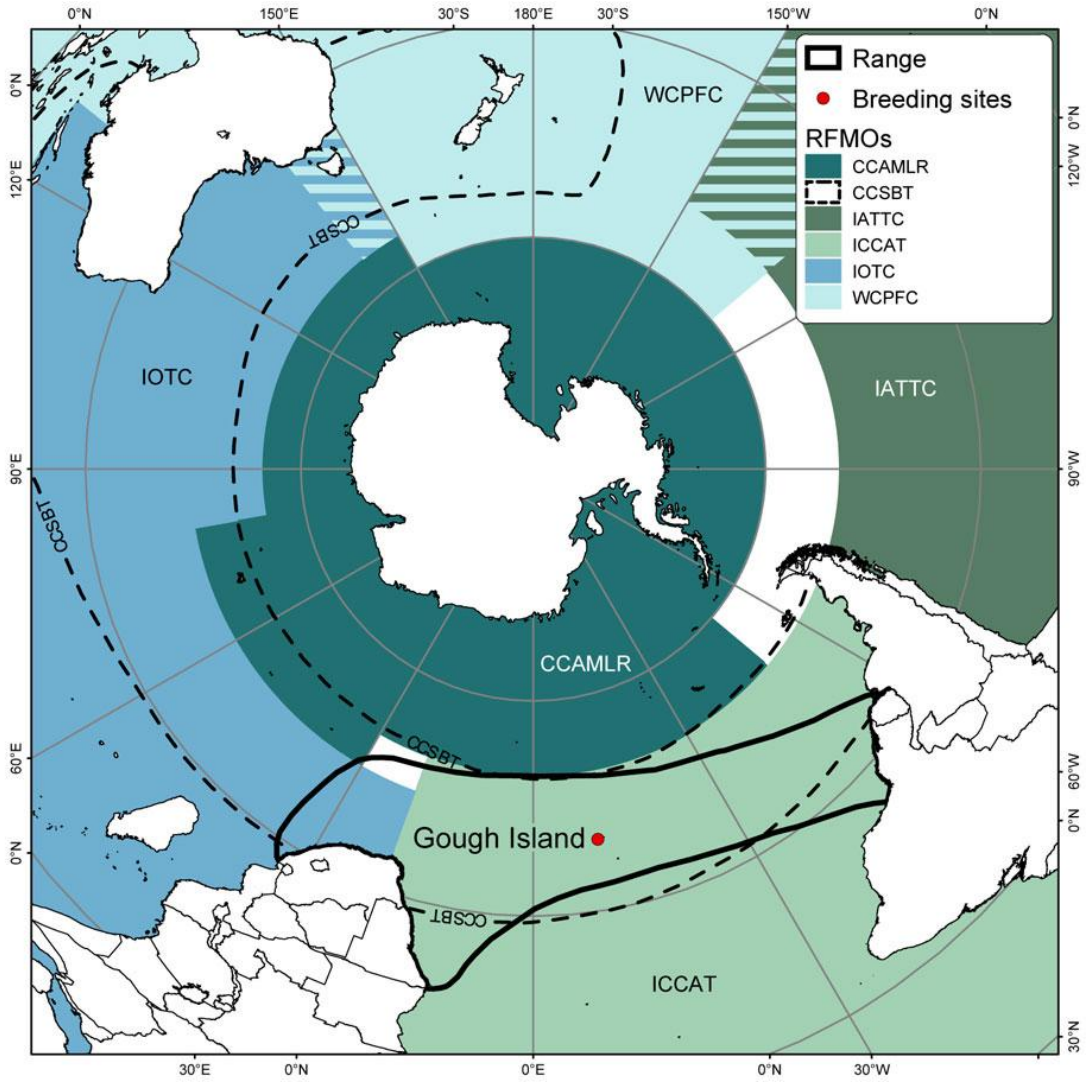


Figure 1. The location of the breeding site of the last viable population and approximate range of D. dabbenena *with the boundaries of selected Regional Fisheries Management Organisations (RFMOs) also shown. Range is based on at-sea observations and satellite-tracking data [19]. One record of an adult* D. dabbenena *off western Australia also exists [20].*

CCAMLR – Commission for the Conservation of Antarctic Marine Living Resources
CCSBT - Convention for the Conservation of Southern Bluefin Tuna
IATTC - Inter-American Tropical Tuna Commission
ICCAT - International Commission for the Conservation of Atlantic Tunas
IOTC - Indian Ocean Tuna Commission
WCPFC - Western and Central Pacific Fisheries Commission

CONSERVATION LISTINGS AND PLANS FOR THE BREEDING SITES

International

Gough Island and Inaccessible Island

- UNESCO Natural World Heritage List – Gough Island Nature Reserve (criteria iii, iv. Listed in 1996 [21], extended to include Inaccessible Island in 2004) [22]
- Ramsar Convention List of Wetlands of International Importance (designated 2008) [23]

UK Overseas Territories

Gough Island and Inaccessible Island

- Nature Reserve - *The Conservation of Native Organisms and Natural Habitats (Tristan da Cunha) Ordinance 2006* [15]
- Gough Island Management Plan 1994 [24]
- Inaccessible Island Management Plan 2001 [25]

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POPULATION TRENDS

A population of *D. dabbenena* bred on the main island of Tristan da Cunha in historical times, but was extirpated there between 1881 and 1907 due to human predation and possibly invasive species [26]. On Inaccessible Island, a small colony (estimated to be around 200 pairs) was present in the 1870s [26]. The population collapsed under predation pressure from humans and introduced domestic pigs *Sus scrofa* [27] and the colony now numbers 2-3 pairs, with 0-1 annual breeding attempts [18]. The failure of the population to recover is believed to be due to low adult survival as a result of incidental mortality from fisheries. The first census of incubating *D. dabbenena* adults on Gough Island was conducted in 1956, when 1,130 pairs were reported [28]. More recent texts have cast considerable doubt over the accuracy of that count and suggest that it was a significant underestimate [16, 17]. The next adult census totalled 2,400 pairs (2001) [16], but appears to have been a year of strong asymmetry in the meta-population – all subsequent counts (2004-2008) have been substantially lower, averaging 1,642 pairs (range 1,271-1,939) per year [17, 29].

Trends cannot be calculated for either population using linear regressions because only short sequence of reliable data exist, exacerbated by the inter-annual fluctuations in the proportion of the population that attempts to breed, a situation inherent to biennial breeders. A demographic model showed the population on Gough is currently decreasing at a rate of 2.85% per year, and mean chick production (12 years of data, 1979-2007) is decreasing annually by 1% [17, 29], pointing to low adult survival as a major cause, with low annual rates of chick production also a significant negative factor.

Table 4. *Summary of population trend data for* D. dabbenena.

Breeding site	Current Monitoring	Trend Years	% average change per year	Trend	% of population
Gough Island	Yes	-	-2.85 [29]	Decreasing	100%
Inaccessible Island	No	-	-	-	

Breeding success on Gough Island is abnormally low by comparison with sister taxa, averaging at most 32.6 ±7.6% (range 27- 45%) [17]. In 2008, breeding success was only 12% (J. Cooper pers. comm.) Data are inadequate to estimate juvenile survival rates, but annual adult survival, based on 21 years of recapture data from 1985-2007, is estimated to be around 91%, insufficient to maintain a stable population of *Diomedea* albatross [16].

Table 5. *Demographic data for the two* D. dabbenena *breeding sites. Table based on Wanless 2007 [17].*

Breeding site	Mean breeding success (±SD; Years)	Mean juvenile survival	Mean adult survival
Gough Island	32.6% (±7.6%; 2001-2007[1])	In progress	91% (1985-2007[2])
Inaccesible Island	No data	No data	No data

[1] Missing data: 2002-2003
[2] Missing data: 2005

BREEDING SITES: THREATS

Both breeding sites of *D. dabbenena* are legally protected. However, a major threat exists on Gough Island where predation by introduced house mice *Mus musculus* on *D. dabbenena* chicks is widespread (Table 6).

Table 6. *Summary of known threats causing population level changes at the breeding sites of* D. dabbenena.

Breeding site	Human disturbance	Human take	Natural disaster	Parasite or Pathogen	Habitat loss or degradation	Predation by alien species	Contamination
Gough Island	No	No	No	No	No	Medium [a]	No
Inaccessible Island	No	No	No	No	Low [b]	No	No

[a] Widespread predation by introduced house mice *Mus musculus* on *D. dabbenena* chicks accounts for up to 50% of failures (and annually 30-40% of all nesting attempts) [16, 17, 30]. A population model suggests that even if adult mortality through fishery interactions were ameliorated, chick production would be too low and the population would continue to decrease [16, 29]. The combined effects of low chick production and low adult survival appear to be driving a precipitous decrease.

[b] Climate change may drive the treeline higher, eliminating the limited amount of open wet heath habitat that *D. dabbenena* requires for breeding [18]. This has the potential to extirpate this colony, but will have an insignificant effect on the global population.

FORAGING ECOLOGY AND DIET

The difficulty of separating *D. exulans* from *D. dabbenena* at sea means that there is no information on the latter's feeding habits. In general, *Diomedea* albatrosses surface-seize cephalopods, fish and crustaceans. They forage independently but may aggregate at point sources (such as carcasses and fishing vessels). A single dietary study, on squid beaks from chick regurgitates, found that histioteuthid cephalopods were most important numerically and by biomass [31]. The prevalence of this bioluminescent group of cephalopods suggests that *D. dabbenena* often feed at night. The importance of fish, crustacean and other dietary items in *D. dabbenena* diet is unknown. Plastic remains are occasionally seen in stomach contents of chicks on Gough Island (R. Wanless pers. obs.)

MARINE DISTRIBUTION

Satellite-tracking data from 38 individuals indicated that during the breeding season the species is restricted to the southern Atlantic Ocean, predominantly between 30-45° S [32] (Figure 2). During non-breeding periods, birds disperse to the east coast of South America and the south west of Western Australia, as well as moving north to waters off Namibia and Angola (Figure 3). Recoveries from banded birds and observations by the BirdLife International Albatross Task Force indicate mortality in longline fisheries operating in Brazilian and Uruguayan waters (R. Wanless unpubl, see also [33]).

Photo © R. Wanless & A. Angel

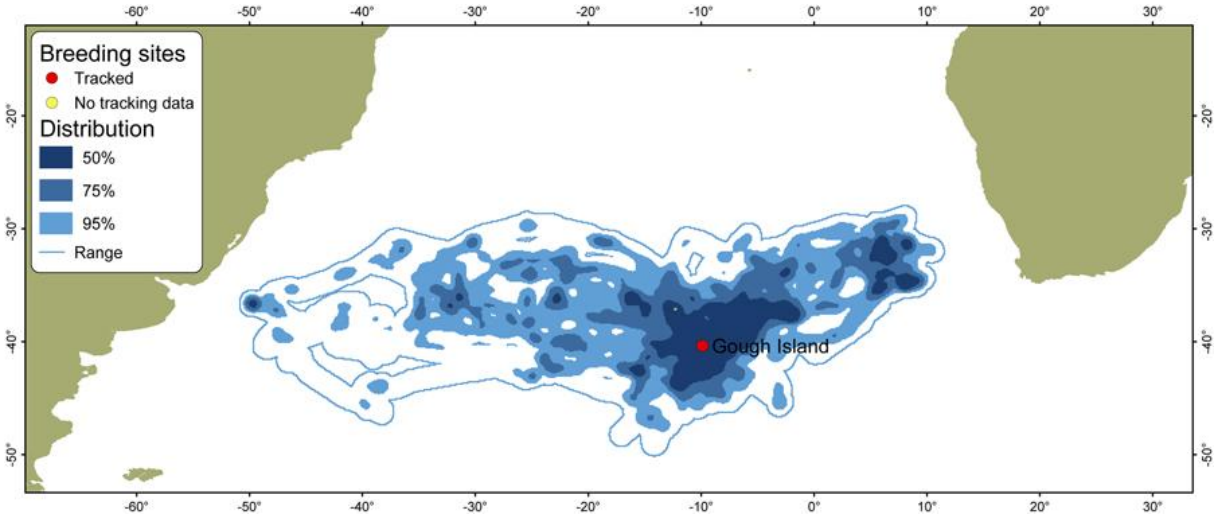

Figure 2. Satellite-tracking data of breeding D. dabbenena *from Gough Island (Number of tracks = 128). Map based on data contributed to the BirdLife Global Procellariiform Tracking Database.*

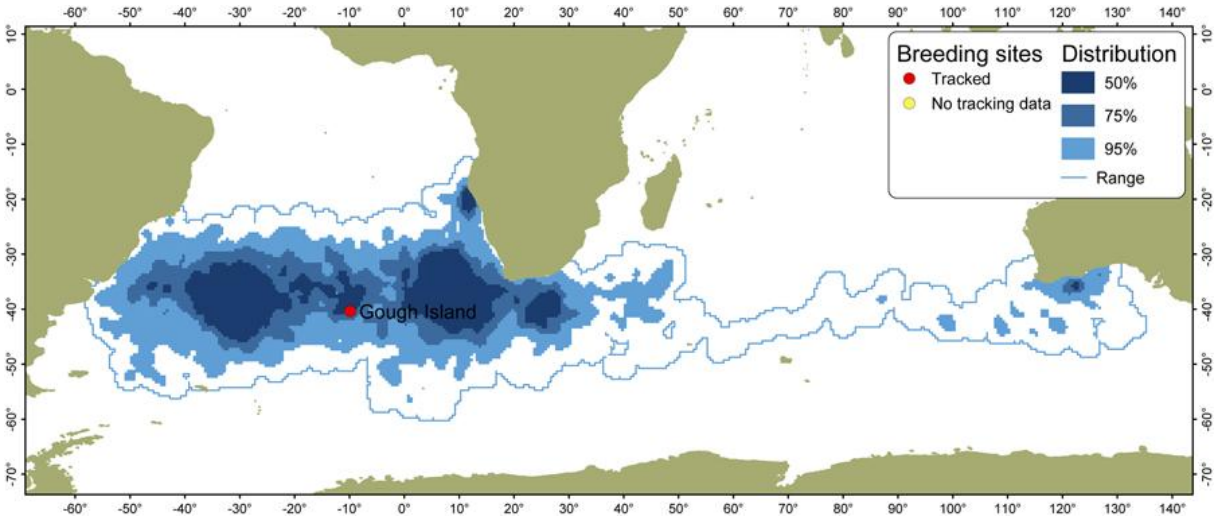

Figure 3. Satellite-tracking data of non-breeding D. dabbenena *from Gough Island (Number of tracks = 14). Map based on data contributed to the BirdLife Global Procellariiform Tracking Database.*

United Kingdom and South Africa are the principal Range States for *D. dabbenena* (Table 7). The abundance of *D. dabbenena* around Australia and Argentina is not well understood at present. *Diomedea dabbenena* overlaps with six Regional Fisheries Management Organisations, principally with the CCSBT, ICCAT, and SEAFO (South-East Atlantic Fisheries Organisation) (Figure 1; Table 7). The species also overlaps with IOTC, SWIOFC (South-West Indian Ocean Fisheries Commission) and SIOFA (Southern Indian Ocean Fisheries Agreement), the last two aimed at ensuring the long-term conservation and sustainable use of fishery resources other than tuna and principally responsible for trawl and artisanal fisheries. SEAFO also manages pelagic species such as Patagonian toothfish *Dissostichus eleginoides*.

Table 7. *Summary of the known ACAP Range States, non-ACAP Exclusive Economic Zones and Regional Fisheries Management Organisations that overlap with the marine distribution of* D. dabbenena.

	Resident/ Breeding and feeding range	Foraging range only	Few records - outside core foraging range
Known ACAP Range States	United Kingdom	Australia Brazil South Africa Uruguay	Argentina?
Exclusive Economic Zones of non-ACAP countries	-	Angola Namibia Mozambique	-
Regional Fisheries Management Organisations[1]	CCSBT ICCAT SEAFO	IOTC SIOFA SWIOFC	CCAMLR

[1] See Figure 1 and text for list of acronyms

MARINE THREATS

Diomedea dabbenena is vulnerable to capture on longlines [34, 35]. The few banding recoveries from longliners have all been from the southwest Atlantic Ocean. Recent data from Brazil show that Tristan albatross is also one of several bycatch species in pelagic longline fisheries there [33]. Longlining mortality is believed to account in large measure for the low observed adult survival [16, 17]. Mortality associated with trawling vessels is not well known but merits more attention [36]. Drowning in driftnets (including gear lost at sea) appears to have abated as a significant threat, but information is also lacking. Remains of *D. dabbenena* chicks on Gough Island occasionally include plastic, but the extent and severity of plastic ingestion is unknown.

KEY GAPS IN SPECIES ASSESSMENT

Eradication of the predatory mouse population on Gough Island should be a priority and management options (including eradication) are currently being considered [37]. Better data on the nature and scale of fishery interactions are urgently required. On Gough Island, *D. dabbenena* has been well studied since 1999, but long-term monitoring data were, until recently, restricted to a very small sub-colony (6-23 pairs). A larger sample size is required to better estimate critical demographic parameters such as adult and juvenile survival, return rates to colonies after successful and failed breeding attempts, divorce rates, and population trends. Juvenile distribution at sea is also currently unknown.

Photo © R. Wanless & A. Angel

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RECOMMENDED CITATION

Agreement on the Conservation of Albatrosses and Petrels. 2009. ACAP Species assessment: Tristan Albatross *Diomedea dabbenena.* Downloaded from http://www.acap.aq on 4 September 2009.

GLOSSARY AND NOTES

(i) **Years**.
The "split-year" system is used. Any count (whether breeding pairs or fledglings) made in the austral summer (e.g. of 1993/94) is reported as the second half of this split year (i.e. 1994).

The only species which present potential problems in this respect are *Diomedea* albatrosses, which lay in December-January, but whose fledglings do not depart until the following October-December. In order to keep records of each breeding season together, breeding counts from e.g. December 1993-January 1994 and productivity counts (of chicks/fledglings) of October-December 1994 are reported as 1994.

If a range of years is presented, it should be assumed that the monitoring was continuous during that time. If the years of monitoring are discontinuous, the actual years in which monitoring occurred are indicated.

(ii) Methods Rating Matrix (based on NZ rating system)

METHOD
A Counts of nesting adults (Errors here are detection errors (the probability of not detecting a bird despite its being present during a survey), the "nest-failure error" (the probability of not counting a nesting bird because the nest had failed prior to the survey, or had not laid at the time of the survey) and sampling error).
B Counts of chicks (Errors here are detection error, sampling and nest-failure error. The latter is probably harder to estimate later in the breeding season than during the incubation period, due to the tendency for egg- and chick-failures to show high interannual variability compared with breeding frequency within a species).
C Counts of nest sites (Errors here are detection error, sampling error and "occupancy error" (probability of counting a site or burrow as active despite it's not being used for nesting by birds during the season).
D Aerial-photo (Errors here are detection errors, nest-failure error, occupancy error and sampling error (error associated with counting sites from photographs), and "visual obstruction bias" - the obstruction of nest sites from view, always underestimating numbers).
E Ship- or ground- based photo (Errors here are detection error, nest-failure error, occupancy error, sampling error and "visual obstruction bias" (the obstruction of nest sites from view from low-angle photos, always underestimating numbers)
F Unknown
G Count of eggs in subsample population
H Count of chicks in subsample population and extrapolation (chicks x breeding success - no count of eggs)

RELIABILITY
1 Census with errors estimated
2 Distance-sampling of representative portions of colonies/sites with errors estimated
3 Survey of quadrats or transects of representative portions of colonies/sites with errors estimated
4 Survey of quadrats or transects without representative sampling but with errors estimated
5 Survey of quadrats or transects without representative sampling nor errors estimated
6 Unknown

(iii) Population Survey Accuracy
High Within 10% of stated figure;
Medium Within 50% of stated figure;
Low Within 100% of stated figure (eg coarsely assessed via area of occupancy and assumed density)
Unknown

(iv) Population Trend
Trend analyses were run in TRIM software using the linear trend model with stepwise selection of change points (missing values removed) with serial correlation taken into account but not overdispersion.

(v) Productivity (Breeding Success)
Defined as proportion of eggs that survive to chicks at/near time of fledging unless indicated otherwise

(vi) Juvenile Survival

defined as:

1 Survival to first return/resight;
2 Survival to x age (x specified), or
3 Survival to recruitment into breeding population
4 Other
5 Unknown

(vii) Threats

A combination of scope (proportion of population) and severity (intensity) provide a level or magnitude of threat. Both scope and severity assess not only current threat impacts but also the anticipated threat impacts over the next decade or so, assuming the continuation of current conditions and trends.

		Scope (% population affected)			
		Very High (71-100%)	High (31-70%)	Medium (11-30%)	Low (1-10%)
Severity (likely % reduction of affected population within ten years)	Very High (71-100%)	**Very High**	**High**	**Medium**	**Low**
	High (31-70%)	**High**	**High**	**Medium**	**Low**
	Medium (11-30%)	**Medium**	**Medium**	**Medium**	**Low**
	Low (1-10%)	**Low**	**Low**	**Low**	**Low**

(viii) Maps

The satellite-tracking maps shown were created from platform terminal transmitter (PTT) and global-positioning system (GPS) loggers. The tracks were sampled at hourly intervals and then used to produce kernel density distributions, which have been simplified in the maps to show the 50%, 75% and 95% utilisation distributions (i.e. where the birds spend x% of their time). The full range (i.e. 100% utilisation distribution) is also shown. Note that the smoothing parameter used to create the kernel grids was 1 degree, so the full range will show the area within 1 degree of a track. In some cases the PTTs were duty-cycled: if the off cycle was more than 24 hours it was not assumed that the bird flew in a straight line between successive on cycles, resulting in isolated 'blobs' on the distribution maps. It is important to realise that these maps can only show where tracked birds were, and blank areas on the maps do not necessarily indicate an absence of the particular species.