Indian Yellow-nosed Albatross
Thalassarche carteri

Albatros de l'océan Indien
Albatros clororrinco del Índico

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

Sometimes referred to as
Indian Yellow-nosed Mollymawk
Eastern Yellow-nosed Albatross

Photo © Brook Whylie

TAXONOMY

Order Procellariiformes
Family Diomedeidae
Genus *Thalassarche*
Species *T. carteri*

Originally classified as *Diomedea chlororhynchos* (Rothchild 1903), *Thalassarche carteri* was elevated to specific status when *Diomedea chlororhynchos* was placed in the genus *Thalassarche* [1] and split into two species: *T. chlororhynchos* (Atlantic Yellow-nosed Albatross) and *T. carteri* (Indian Yellow-nosed Albatross) [2]. The recognition of *T. chlororhynchos* and *T. carteri* remains controversial [3] but this classification has been adopted by ACAP [4], Birdlife International [5], and several recent field guides and handbooks of Southern Ocean seabirds [6, 7, 8].

CONSERVATION LISTINGS AND PLANS

International

- Agreement on the Conservation of Albatrosses and Petrels - Annex 1 [4]
- 2008 IUCN Red List of Threatened Species - Endangered [9]
- Convention on Migratory Species - Appendix II (as *Diomedea chlororhynchos*) [10]

Australia

- *Environment Protection and Biodiversity Conservation Act 1999 (EPBC ACT)* [11]
  - Vulnerable
  - Migratory Species
  - Marine Species
- Recovery Plan for Albatrosses and Giant Petrels (2001) [12]
- Threat Abatement Plan 2006 for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations [13]

South Australia

- *National Parks and Wildlife Act 1972* – Endangered (as *Diomedea chlorrhynchos carteri*) [14]

Western Australia

- *Wildlife conservation Act 1950 - Wildlife Conservation (Specially Protected Fauna) Notice 2008 (2)* – Fauna that is rare or is likely to become extinct [15]

France

- Ministerial Order of 14 August 1998 *(Arrêté du 14 août 1998*; as *Diomedea chlororhynchos)* [16]
  - Listed Protected Species

South Africa

- *Sea Birds and Seals Protection Act, 1973 (Act No. 46 of 1973) (SBSPA)* [17]
- Policy on the Management of Seals, Seabirds and Shorebirds: 2007 [18]
- National Plan of Action (NPOA) for reducing Incidental Catch of Seabirds in Longline Fisheries 2008 [19]

BREEDING BIOLOGY

Thalassarche carteri nests colonially and is an annual breeding species; each breeding cycle lasts about eight months. Eggs are laid in September-October and are incubated for 78 days before hatching in November-December (Table 1). Chicks fledge in March-April after approximately 115 days in the nest [20, 21].

Table 1. *Breeding cycle of* T. carteri*.*

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
At colonies			■	■	■	■	■	■	■	■	■	
Egg laying				■	■							
Incubating					■	■	■					
Chick provisioning						■	■	■	■	■	■	

Photo © Scott A. Shaffer

BREEDING STATES

Table 2. *Distribution of the global* T. carteri *population among Parties to the Agreement.*

	France	New Zealand	South Africa
Breeding pairs	81%	<1%	19%

BREEDING SITES

Thalassarche carteri breed on the French subantarctic island groups of Amsterdam, St Paul, Crozet, and Kerguelen Islands and on South Africa's Prince Edward Islands (Figure 1). Approximately 65% of the global population occurs on Amsterdam Island (Table 3). In 1998 the breeding population was estimated to be approximately 36,500 breeding pairs, corresponding to a total population of between 160,000 and 180,000 individuals [22]. A single pair of *T. carteri* has been recorded on the Chatham Islands off the east coast of New Zealand [22] and although of interest as a significant breeding range extension, this pair is not considered further in this assessment.

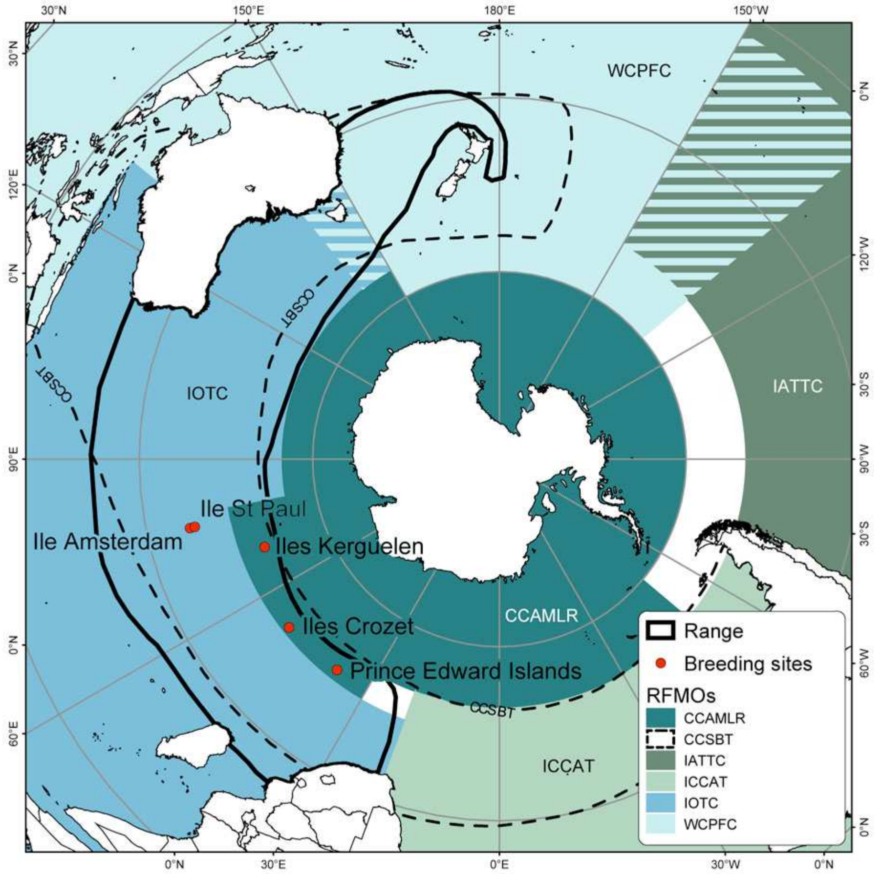

Figure 1. *The location of main* T. carteri *breeding sites and the species' approximate range inferred from observations and satellite tracking data* [23, 24, 25, 26, 27]. *The boundaries of selected Regional Fisheries Management Organisations (RFMOs) are also shown.*

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

Table 3. *Estimates of the population size (annual breeding pairs) for each* T. carteri *breeding site. Table based on unpublished CNRS Chizé data and published references as indicated. See Glossary and Notes for explanation of monitoring methods and accuracy codes.*

Breeding site location	Jurisdiction	Years monitored	Monitoring method	Monitoring accuracy	Annual breeding pairs (last census)
Crozet Islands 46° 26'S, 51° 47'E					
Ile des Pingouins	France	1984	A	High	5,800 (1984) [28]
Iles des Apôtres	France	1984	A	High	1,230 (1984) [28]
Kerguelen Islands 49° 09'S, 69° 16'E					
Iles Nuageuses	France	1985, 1987	A	High	50 (1987) [29]
Amsterdam Island 37° 48'S, 77° 32'E	France	1979-2006	A, E	High	c.27,000 (2006) [30]
Saint Paul Island 38° 48'S, 77° 27'E	France	1993-2005	C	High	3 – 7 (2005)
Prince Edward Island 46° 38'S, 37° 57'E	South Africa	2002, 2009	A	High	7,500 (2002) [31]

CONSERVATION LISTINGS AND PLANS FOR THE BREEDING SITES

International

Prince Edward Island, Ile des Pingouins, Iles des Apõtres, Iles Nuageuses, Amsterdam Island and St Paul Island

- RAMSAR Convention List of Wetlands of International Importance (inscribed 2007 and 2008) [32]

France

Ile des Pingouins, Iles des Apõtres, Iles Nuageuses, Amsterdam Island and St Paul Island

- National Nature Reserve *(Décret no 2006-1211)* [33]

French Southern Territories (Terres australes et antarctiques françaises, TAAF)

Amsterdam Island and St Paul Island

- Area restricted to scientific and technical research *(Arrêté 14 du 30 juillet 1985)* [34]

Ile des Pingouins, Ilots des Apõtres, Iles Nuageuses

- Controlled access areas *(Arrêté 15 du 30 juillet 1985)* [35]

South Africa

Prince Edward Island

- Special Nature Reserve (declared 1995) - *National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003)* [36]
- Prince Edward Islands Management Plan 1996 [37]

POPULATION TRENDS

Of the six islands where *T. carteri* breed, only on Amsterdam Island have there been regular surveys of breeding pairs. These surveys have been focused on a plot of breeding birds within the colony at Pointe d'Entrecasteaux. At this site the number of breeding pairs has declined from over 250 pairs in 1978 to just 113 pairs in 2005 (Figure 2) [30, 38].

Trend analyses indicate that this study population of *T. carteri* is decreasing at a rate of approximately 4% per year ($p<0.01$) [39] (Table 4).

Between 1982 and 2006 the total population of *T. carteri* on Amsterdam Island is estimated to have decreased from 37,000 to 27,000 pairs [30].

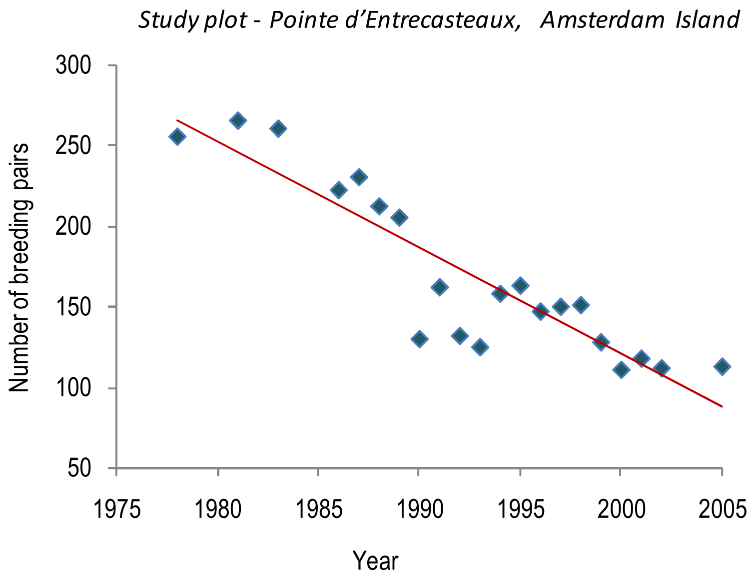

Figure 2. *Counts of the total number of breeding pairs within a study plot at Pointe d'Entrecasteaux on Amsterdam Island with a simple regression line fitted. Data from Weimerskirch (2004)* [38] and *Rolland* et al. *(2009)* [30].

Table 4. *Summary of population trend data for* T. carteri. *Based on counts of breeding pairs extracted from Weimerskirch (2004)* [38].

Breeding site	Current monitoring	Trend Years	% average change per year [39] (95% Confidence Interval)	Trend	% of population for which trend calculated
Crozet Islands					
Ile des Pingouins	Unknown	-	-	Unknown	-
Ile des Apõtres	Unknown	-	-	Unknown	-
Kerguelen Islands					
Iles Nuageuses	Unknown	-	-	Unknown	-
Amsterdam Island	Unknown	1978-2002*	-3.9 (-3.4, -4.3)	Declining	<1%
		1982-2006	-1.4 [30]	Declining	100%
		1982-1995	-4.9 [30]	Declining	100%
Saint Paul Island	Unknown	-	-	Unknown	-
Prince Edward Island	Unknown	-	-	Unknown	-

*Missing data – 1979, 1980, 1982, 1984, 1985

Breeding success and adult survival data have been collected in a study plot of breeding birds at Pointe d'Entrecasteaux since 1978. On average, adult survival is around 88%, which is lower than most other albatrosses (see Appendix 2 in Vèran *et al*. 2007 [40]). The recent average breeding success of just 13.9% and juvenile survival of only 46% is also very low (Table 5) [30, 41]. The breeding success at Pointe d'Entrecasteaux has only twice exceeded 20% in the years between 1990 and 2002 [38]. High breeding failure in the study plots was due to avian cholera [38] but may be less severe in other parts of the colony where population decline was lower [30].

Table 5. *Demographic data for* T. carteri. *Table based on Weimerskirch and Jouventin (1998)* [41] *and Rolland* et al. *(2009)* [30].

Breeding site	Mean breeding success %/year ±SE/SD and Study period	Mean juvenile survival %/year ±SD and Study period (no. of cohorts)	Mean adult survival %/year ±SE/SD and Study period
Crozet Islands			
Ile des Pingouins	No data	No data	No data
Ile des Apõtres	No data	No data	No data
Kerguelen Islands			
Iles Nuageuses	No data	No data	No data
Amsterdam Island	24.5 ±18.3 SD 1978-1995 [41]	15.4 ±7.3¹1978-1995 (8) [41]	85.7 ±0.5 SD 1978-1995 [41]
	13.9 ±14.9 SE 1986-2005 [30]	45.7 ±4.4² 1980-1993 [30]	88.4 ±6.0 SE 1982-2005 [30]
Saint Paul Island	No data	No data	No data
Prince Edward Island	No data	No data	No data

¹ Survival to first return

² Survival to 1 year old

BREEDING SITES: THREATS

Amsterdam Island is the key breeding site for this species (65% of global population, see Table 3). Therefore, threats impacting at this breeding site have the most significant impacts for the species overall.

Table 6. *Summary of known threats causing population level changes at the breeding sites of* T. carteri. *Table based on unpublished data submitted to the ACAP Breeding Sites Working Group in 2008.*

Location	Human disturbance	Human take	Natural disaster	Parasite or Pathogen	Habitat loss or degradation	Predation by alien species	Contamination
Crozet Islands							
Ile des Pingouins	no	no	no	no	no	no	no
Ile des Apôtres	no	no	no	no	no	no	no
Kerguelen Islands							
Iles Nuageuses	no	no	no	no	no	no	no
Amsterdam Island	no	no	no	Medium [a]	no [b]	Low [c]	no
Saint Paul Island	no	no	no	no	no	no	no
Prince Edward Islands	no	no	no	no	no	no	no

[a] The outbreak of two diseases in the 1980s (avian cholera, *Pasteurella multocida*, and another pathogenic bacterium, *Erysipelas*) has been identified as a cause of the decline of *T. carteri* on Amsterdam Island. The diseases mainly affect young chicks, with a cyclic pattern between years, but also kill adult birds [29]. In some years breeding success approximates zero in the study plot [30, 41].

[b] Previously fire caused by humans has been a threat to the population, in 1974 a large fire impacted a colony and "numerous" chicks were killed [42]. In the past habitat destruction by introduced cattle *Bos taurus* has degraded the breeding sites but fencing of cattle has reduced their impact in recent years [43].

[c] Introduced mammals (especially feral cats, *Felis catus*, and Black rats, *Rattus rattus*) are present on some of the breeding islands, but with the exception of Amsterdam Island there is little evidence to suggest that they are having a significant detrimental impact on *T. carteri*.

FORAGING ECOLOGY AND DIET

The feeding behaviour of *T. carteri* is characterised by surface seizing and shallow dives. During the breeding season birds from Iles Crozet feed on a wide range of squid (38% fresh mass) and fish (58% fresh mass) taxa, with crustaceans being taken less frequently (4% fresh mass) [44]. A study on Amsterdam Island found approximately the same diet proportions [45].

MARINE DISTRIBUTION

Satellite-tracking data are only currently available from breeding *T. carteri* from Amsterdam Island. These birds largely stay within 1800 km of their nest sites during this stage of the annual cycle (Figure 3) [45, 46, 47]. The non-breeding range is largely taken from at-sea records reported in monographs and field guides [23, 25]. These indicate that during winter *T. carteri* disperse from their breeding islands and commonly occur off southern Africa and Australia (Figure 1). This species is also known to occur through the Tasman Sea and as far east as the Chatham Islands but its abundance in the western Pacific is not well documented [22, 24, 26].

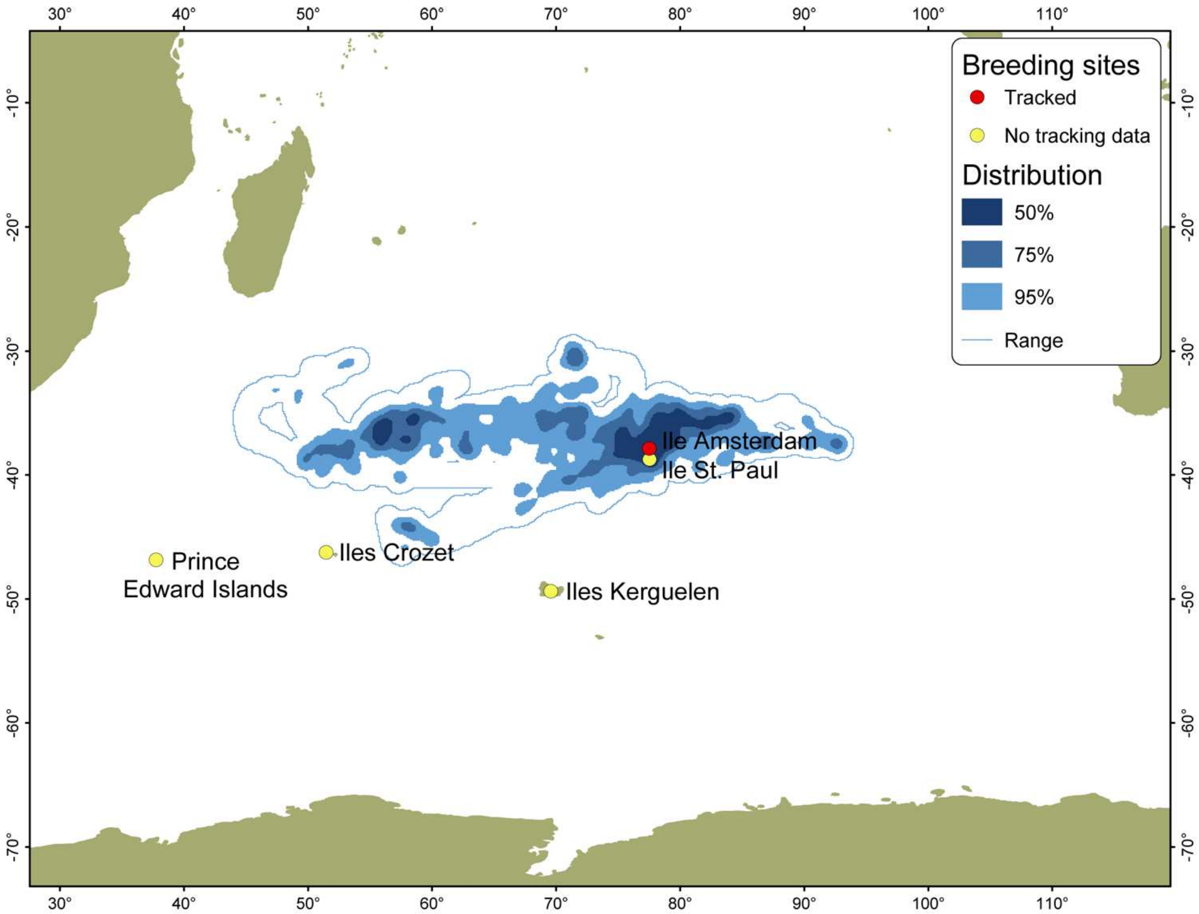

Figure 3. *Satellite-tracking data from incubating adult* T. carteri *albatrosses (Number of tracks = 34). Map based on data contributed to the BirdLife Global Procellariiform Tracking Database* [27]. *A recent study showed that some individuals from Amsterdam Island also forage up to 1300 km east off their colony* [47].

France, South Africa and Australia are the principal Range States for *T. carteri*. The abundance of *T. carteri* around New Zealand is not well understood (Figure 1; Table 7). *Thalassarche carteri* overlap with eight Regional Fisheries Management Organisations, but principally the IOTC, CCSBT, CCAMLR, 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, (Figure 1; Table 7). The species also overlaps with WCPFC and SEAFO (South-East Atlantic Fisheries Organisation). Consultations are also currently underway to establish the South Pacific Regional Fisheries Management Organisation (SPRFMO) that would cover both pelagic and demersal fisheries in the region and which would overlap with *T. carteri* foraging range.

Table 7. *Summary of the known Range States and Regional Fisheries Management Organisations that overlap with the marine distribution of T.* carteri.

	Breeding and feeding range	Foraging range only	Few records - outside core foraging range
Known ACAP Range States	France South Africa	Australia	New Zealand
Exclusive Economic Zones of non-ACAP countries	-	Mozambique Madagascar	-
Regional Fisheries Management Organisations [1]	IOTC CCSBT CCAMLR SWIOFC SIOFA	WCPFC SEAFO SPRFMO[2]	-

[1] See Figure 1 and text for list of acronyms
[2] not yet in force

MARINE THREATS

On Amsterdam Island the decline in *T. carteri* numbers is likely a result of the combined impacts of disease (see above) and interactions with longline fishing across their range. *Thalassarche carteri* overlap with fishing operations targeting tuna species in waters off West Australia, as well as in sub-tropical waters [41, 48]. This species is also known to be killed in longline fishing operations targeting Patagonian Toothfish *Dissostichus eleginoides* in the waters adjacent to the Prince Edward Islands [49]. Recently, there has been a report of one bird caught on a demersal longline off the east coast of the lower North Island, New Zealand (New Zealand Department of Conservation, unpublished).

KEY GAPS IN SPECIES ASSESSMENT

Further information on disease prevalence and impacts on the species is required and appropriate management and mitigation measures to control and limit spread of disease should be implemented as a priority. The distribution at sea is known only for birds breeding at Amsterdam Island. Information on the distribution of birds of different age classes, at different stages of the annual cycle, and from different sites is also required to better assess overlap with fishing operations.

Information on population trends and demographic parameters are limited to the Amsterdam Island population only. The monitoring of population trends and demographic parameters should be continued in order to keep up to date with any changes in population trends and rates of adult and juvenile survival. Studies to ascertain the trends and survival of *T. carteri* at other sites are also lacking.

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RECOMMENDED CITATION

Agreement on the Conservation of Albatrosses and Petrels. 2009. ACAP Species assessments: Indian Yellow-nosed Albatross *Thalassarche carteri.* Downloaded from http://www.acap.aq on 27 August 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 shall 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 that 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).

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

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 either the time effects model (no missing values) or 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

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

level of threat:

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 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.