Black-browed Albatross
Thalassarche melanophris

Albatros à sourcils noirs
Albatros de Ceja Negra

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

Sometimes referred to as Black-browed Mollymawk

TAXONOMY

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

Originally described as *Diomedea melanophris* by Temminck in 1828 (and corrected to *melanophrys* in 1839), this polytypic species was placed in the newly created genus *Thalassarche* by Reinbach (1850). Murphy returned all smaller albatrosses back to *Diomedea* in 1936, although *Thalassarche* was preserved as a subgenus containing just the Black-browed Albatross by Jouanin & Mougin (1979). *Thalassarche* was reinstated at the generic level by Nunn *et al*. in 1996 [1] where the species was placed and eventually split into *T. melanophrys* and *T. impavida* (Campbell Albatross) following Robertson and Nunn (1998) [2]. This classification has been adopted by BirdLife International [3] and ACAP [4]. In June 2010, The International Commission on Zoological Nomenclature has ruled to confirm that *melanophris* is the correct original spelling of the specific name of the Black-browed Albatross [5].

CONSERVATION LISTINGS AND PLANS

International

- Agreement on the Conservation of Albatrosses and Petrels – Annex 1 [4]
- 2010 IUCN Red List of Threatened Species – Endangered (since 2003) [6]
- Convention on Migratory Species - Appendix II (as *Diomedea melanophris*) [7]

Australia

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

New South Wales

- *Threatened Species Conservation Act 1995* – Vulnerable [11]

Tasmania

- *Threatened Species Protection Act 1995* – Endangered [12]

Western Australia

- *Wildlife Conservation Act 1950 - Wildlife Conservation (Specially Protected Fauna) Notice 2008 (2)* – Fauna that is rare or is likely to become extinct [13]

Brazil

- National Species List of Brazilian Fauna Threatened with Extinction (Lista Nacional das Espécies da Fauna Brasileira Ameaçadas de Extinção) - Vulnerable [14]
- National Plan of Action for the Conservation of Albatrosses and Petrels (NPOA - Seabirds Brazil) [15]

Chile

- National Plan of Action for reducing by-catch of seabirds in longline fisheries (PAN-AM/CHILE) 2007 [16]

Falkland Islands (Islas Malvinas)

- *Conservation of Wildlife and Nature Ordinance 1999* [17]
- *Fisheries (Conservation and Management) Ordinance 2005* [18]
- Falkland Islands FAO National Plan of Action for Reducing Incidental Catch of Seabirds In Longline Fisheries 2004 [19]

France

- *Ministerial Order of 14 August 1998 (Arrêté du 14 août 1998*; as *Diomedea melanophris)* [20] - Listed Protected Species

New Zealand

- *New Zealand Wildlife Act 1953* [21]
- Action Plan for Seabird Conservation in New Zealand; Part B: Non-Threatened Seabirds [22]
- New Zealand Threat Classification System List 2008 – Coloniser [23]

South Africa

- *Sea Birds and Seals Protection Act, 1973 (Act No. 46 of 1973) (SBSPA)* [24]
- *Marine Living Resources Act (Act No. 18 of 1996)*: Publication of Policy on the Management of Seals, Seabirds and Shorebirds: 2007 [25]
- National Plan of Action (NPOA) for Reducing the Incidental Catch of Seabirds in Longline Fisheries 2008 [26]

South Georgia (Islas Georgias del Sur)

- *Falkland Island Dependencies Conservation Ordinance 1975* [27]
- FAO International Plan of Action - Seabirds: An assessment for fisheries operating in South Georgia and South Sandwich Islands [28]

Uruguay

- National Plan of Action for Reducing the Incidental Catch of Seabirds in Uruguayan Fisheries (PAN - Aves Marinas Uruguay) 2007 [29]

BREEDING BIOLOGY

Thalassarche melanophris is a colonial, annual breeding species, although only 75% of successful breeders and 67% of failed breeders breed the following year [30]. Each breeding cycle lasts about eight months (Table 1). Depending on location, birds begin returning to colonies from early (Macquarie Island [31], Iles Crozet [32]) to late September (South Georgia/Islas Georgias del Sur [33]). A single egg is laid from late September through October on Macquarie Island [34], and throughout October on Crozet [32] and Kerguelen [35] . Chicks hatch in December and fledge in April – May [31, 34], after 125 days in the nest on Îles Crozet [32]. On South Georgia (Islas Georgias del Sur) egg laying occurs from late October to early November, with chicks hatching in late December to early January after a mean incubation of 68 ±1.2 days and fledging at about 117 days in April - May [33, 36]. Immature birds begin returning to land at least two years after fledging; the numbers of returning birds increase up to age six [37]. The median age of first breeding is 10 (range 8-13 years) [36].

Table 1. *Breeding cycle of* T. melanophris *across all sites. See text for site-specific periods.*

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

BREEDING STATES

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

	Australia	Chile	Disputed*	France	New Zealand
Breeding pairs	<1%	21%	79%	<1%	<1%

*A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Islas Malvinas), South Georgia and the South Sandwich Islands (Islas Georgias del Sur y Islas Sandwich del Sur) and the surrounding maritime areas.

BREEDING SITES

Thalassarche melanophris breed on seven subantarctic islands or archipelagoes – South Georgia (Islas Georgias del Sur), Crozet, Kerguelen, Heard and McDonald, Macquarie, Antipodes, and Campbell, as well as on Falkland Islands (Islas Malvinas) and four island groups off southern Chile – Diego Ramirez, Evangelistas, Diego de Almagro, and Ildefonso (Figure 1). Two additional populations in southern Chile have been discovered recently on islets in Tierra del Fuego [38] and in the Magallanes region [39]. One breeding pair was recorded on the Snares Islands in 1986 [40] but is not considered further in this assessment. Approximately 67% of the global population occurs on the Falkland Islands (Islas Malvinas) (Table 3). The total breeding population is estimated at *c.* 602,000 pairs, down from the 682,000 pairs estimated in 1998 [41].

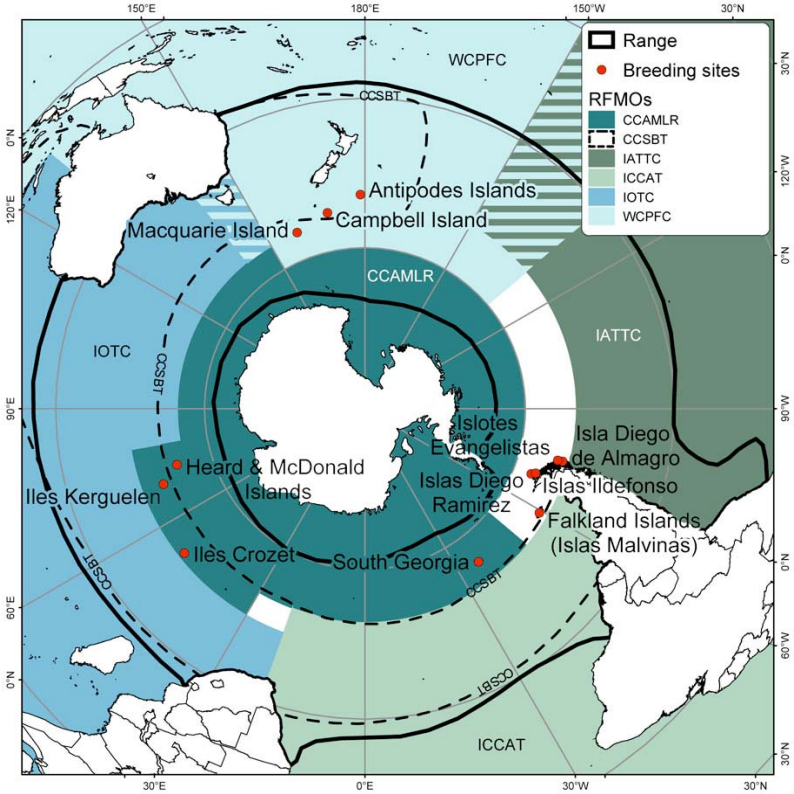

Figure 1. *The location of the main* T. melanophris *breeding sites and the species' approximate range inferred from observations and satellite-tracking data. The boundaries of selected Regional Fisheries Management Organisations (RFMOs) are also shown.*

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 (breeding pairs) for each* T. melanophris *breeding site. Table based on unpublished data (Tasmanian Department of Primary Industries and Water (DPIW) - Macquarie Island; Centre d'Etudes Biologiques de Chizé, Centre National De La Recherche Scientifique (CNRS) - Jeanne d'Arc Peninsula), and published references as indicated. Falkland Islands (Islas Malvinas) numbers in italics are from aerial photographs (Monitoring Method D) from Strange 2008 [42].*

Breeding site location	Jurisdiction	Years monitored	Monitoring method	Monitoring accuracy	Annual breeding pairs (last census)
Heard and McDonald Islands Heard Island 53° 12'S, 73° 32'E	Australia	1948-1955, 1963,1980, 1983, 1986-1988, 2001	A,D	Medium	*c.* 600 (2001) [43]
Macquarie Island 54° 37'S, 158° 51'E	Australia	1995-2007	A	High	46 (2007)
Bishop and Clerk Islets 55° 06'S, 158° 41'E		1993	C	Medium	141 (1993) [41]
Total % of all sites					787 0.1%
Isla Diego de Almagro 51° 30'S, 75° 15'W	Chile	1984,2002	E	High	15,594 (2002) [44]
Total % of all sites					15,594 2.6%
Islotes Evangelistas 52° 23'S, 75° 05'W	Chile				
Islote Elcano		2003	D	High	3,285 (2003) [45]
Islote Lobos		2003	D	High	1,384 (2003) [45]
Total % of all sites					4,669 0.8%
Islas Diego Ramirez 56° 31'S, 68° 43'W	Chile	1981,2003	A,D,E	High	55,000 (2003) [46]
Isla Gonzalo		1980, 1997, 1999-2003	D	High	6,618 (2003) [46]
Isla Bartolomé		2003	A,D,E	High	35,006 (2003) [46]
Islote Santander		2003	D	High	385 (2003) [46]
Islote Ester		2003	D,E	High	2,517 (2003) [46]
Islote Mendoza		2003	D	High	272 (2003) [46]
Islote Martinez		2003	D	High	136 (2003) [46]
Islote Schlatter		2003	D	High	169 (2003) [46]
Islote Norte		2003	D	High	1,250 (2003) [46]
Total % of all sites					*c.* 55,000 9.2%
Islas Ildefonso 55° 44'S, 69° 28'W	Chile	1914,2001,2003	A,D,E	High	47,000 (2003) [47]
Isla Cinclodes		2001,2003	D,E	High	736 (2003) [47]
Isla Norte		1985,2001,2003	A,D,E	High	10,374 (2003) [47]
Isla Spirit		2001,2003	D,E	High	1,314 (2003) [47]
Isla Square		2001,2003	D,E	High	464 (2003) [47]
Isla Sur		2001,2003	D,E	High	4,961(2003) [47]
Isla Grande		2003, 2007	D,E	High	29,146 (2003) [47]
Total % of all sites					*c.* 47,000 7.8%
Islote Albatros 54º 27` S, 69º 01` W	Chile	2003,2007	F	Unknown	40-50 (2007) [48]
Islote Leonard 53° 23'S, 74° 04'W	Chile	2006	A,E	High	594 (2006) [39]
Total % of all sites					648 0.1%

Falkland Islands (Islas Malvinas) [49] / *[42]*					399,416 ±9,743 (2006)
Grand Jason		2001, 2006	A,E,G	High	49,462 / *55,183* (2006)
Steeple Jason		1988, 2001, 2006	A, C	High	171,286 /*145,964* (2006)
South Jason		1985, 2001,2006	E	High	1,738 / *1,550* (2006)
Elephant Jason		1986, 2001, 2006	A	High	1,120 / *1,302* (2006)
West Point Island		1963, 1990, 1994, 1995, 2001, 2006	E	High	13,928 (2006)
Saunders Island		1993, 1996, 2001, 2006	A	High	10,740 (2006)
Beauchêne Island	Disputed*	1981, 2001, 2006	A	High	108,984 / *108,247* (2006)
New Island		1993, 1995, 2001, 2006	E	High	10,177 (2006) / *13,331 (2008)*
North Island		1995, 2001, 2006	A,E	High	20,083 (2006) / *26,795 (2008)*
Grave Cove		1988, 1993, 2001, 2006	A, E	High	285 (2006)
Keppel Island		1988, 2001, 2006	A	High	1,623 (2006)
Bird Island		1986, 2001, 2006	A	High	9,990 (2006) / *15,469 (2006)*
Total					399,416
% of all sites					66.6%
South Georgia (Islas Georgias del Sur) [50]					
54° 19'S, 36° 49'W					
Main Island, Willis Islands		1985, 2004	A,E	High	14,559 (2004)
Trinity Island, Willis Islands		1985, 2004	A,E	High	13,960 (2004)
Bird Island		1977, 1991, 2004	A,E	High	8,264 (2004)
Sorn & Bern coast		1985, 2004	A,E	High	74 (2004)
Cape North		1986, 2004	A,E	High	1,546 (2004)
Welcome Islets		1986, 2004	A,E	High	188 (2004)
Sheathbill Bay		2004	A,E	High	481 (2004)
Sitka Bay		2004	A,E	High	816 (2004)
Cape Buller	Disputed*	2004	A,E	High	177 (2004)
Cape Wilson		2004	A,E	High	205 (2004)
Cape Crewe		2004	A,E	High	42 (2004)
Paryadin Peninsula north		1985, 2004	A,E	High	1,428 (2004)
Paryadin Peninsula south		1985, 2004	A,E	High	3,789 (2004)
Klutschak Point		1986, 2004	A,E	High	784 (2004)
Cape Nunez		1986, 2004	A,E	High	981 (2004)
Annenkov Island		1986, 2004	A,E	High	9,398 (2004)
Green Island		1986, 2004	A,E	High	3,404 (2004)
Rumbolds Point		1986, 2004	A,E	High	2,340 (2004)
Cooper Island		1986, 2004	A,E	High	10,606 (2004)
Clerke Rocks		1990, 2004	A,E	High	1,254 (2004)
Total					74,296
% of all sites					12.4%
Iles Crozet					
46° 26'S, 51° 47'E	France				
Ile de l'Est		1982	F	High	350 (1982) [51]
Ile des Pingouins		1982	F	Low	300 (1982) [51]
Ilots des Apôtres		1982	F	Low	330 (1982) [51]
Total					980
% of all sites					0.2%
Iles Kerguelen					
Jeanne d'Arc Peninsula					3,115-3,215 (1987) [35]
49° 41'S, 70° 00'E	France	1980-2007	A	High	1,047-1,056 (2007)
Loranchet Peninsula		1987	A	Low	200-300 [35]
Croy Island, Iles Nuageuses		1987	A	High	1,815 [35]

Total % of all sites					3,215 0.5%
Antipodes Islands Bollons Island 49° 39'S, 178° 40'E	New Zealand	1996	E	Unknown	115 (1996) [52]
Campbell Island 52° 33'S, 169° 09'E	New Zealand	1995	F	Unknown	>30 (1995) [41]
Total % of all sites					135 0.02%
Total for all sites					*601,686*

*see Table 2 footnote

CONSERVATION LISTINGS AND PLANS FOR THE BREEDING SITES

International

Heard Island and McDonald Islands, Campbell Island, Antipodes Islands

- UNESCO World Heritage List (inscribed 1997 and 1998) [53]

Macquarie Island

- UNESCO World Heritage List (inscribed 1997) [53]
- UNESCO Biosphere Reserve - Man and the Biosphere Programme (inscribed 1977) [54]

Iles Crozet and Iles Kerguelen

- Ramsar Convention List of Wetlands of International Importance (inscribed 2008) [55]

Australia

Heard Island and McDonald Islands

- National Heritage List – *EPBC Act 1999* (listed 2007) [8]
- Heard Island and McDonald Islands (HIMI) Marine Reserve - *EPBC Act 1999* (declared 2002) [8]

Macquarie Island

- Register of Critical Habitat - *EPBC Act 1999* (listed 2002) [8]
- Register of the National Estate (until February 2012) – *Australian Heritage Commission Act 1975* (listed 1977) *[56]*
- National Heritage List – *EPBC Act 1999* (listed 2007) [8]

Tasmania

Macquarie Island

- Nature Reserve - *Nature Conservation Act 2002* (Tasmania) [57]
- Macquarie Island Nature Reserve and World Heritage Area Management Plan 2006 [58]
- Plan for the Eradication of Rabbits and Rodents on Subantarctic Macquarie Island 2007 [59]

Falkland Islands (Islas Malvinas)

South Jason, Elephant Jason, Beauchene Island, New Island, Bird Island

- National Nature Reserve - *Conservation of Wildlife and Nature Ordinance 1999* [17]

France

Iles Crozet and Iles Kerguelen

- National Nature Reserve (*Réserve Naturelle Nationale*) - Décret n°2006-1211 [60]. Specific areas have higher level of protection (Integral Protection Areas, *Aires de Protection Intégrale*), including Ile de l'Est Ile des Pingouins, Ilots des Apôtres (Iles Crozet) where the species nest, and some islands and coastal areas in Kerguelen.

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

Iles Crozet (some costal areas of Possession Island); Iles Kerguelen (Sourcils Noir, some islands and coastal parts of Golfe du Morbihan)

- Areas Reserved for Technical and Scientific Research (*Zones Réservées à la Recherche Scientifique et Technique)* Arrêté n°14 du 30 juillet 1985 [61], now included in Natural Reserve Management Plan [60].

New Zealand

Campbell Island and Antipodes Islands

- National Nature Reserve - *New Zealand Reserves Act 1977* [62]
- Conservation Management Strategy. Subantarctic Islands 1998-2008 [63]

South Georgia (Islas Georgias del Sur)

- South Georgia Environmental Management Plan 2000 [64]
- South Georgia: Plan for Progress. Managing the Environment 2006 – 2010 [65]

Bird Island, Willis Island (Main and Trinity Islands), Paryadin Peninsula, Cape Nunez, Annenkov and Cooper Islands

- Specially Protected Area (SPA) - South Georgia: Plan for Progress. Managing the Environment 2006 – 2010 [65]

POPULATION TRENDS

The data available to establish population trends for *T. melanophris* are limited at most sites due to lack of regular, comparable surveys (Table 4). One of the best monitored populations on Bird Island, South Georgia (Islas Georgias del Sur) decreased by an average of 1.8% per annum (breeding birds) at several colonies between 1977 and 1996 [66]. More recent data indicate that the entire Bird Island breeding population, which accounts for 11% of the total South Georgia (Islas Georgias del Sur) population, decreased by 4% per annum between 1990 and 2004 [50] following a period of stability or slight increase between the late 1970s and late 1980s [30]. The large Falkland Islands (Islas Malvinas) population (*c.* 67% of world total breeding population) also decreased at *c.* 1% per annum between 2000 and 2005, although some colonies have increased in size; the trends are not consistent between years and sites, and even between sub-colonies within sites [49]. In addition, a number of breeding sites surveyed by aerial photography from the 1960s until 2008 have reportedly shown increases of between 21 and 141% [42].

Long term data for an intensively studied colony on Iles Kerguelen indicated an overall constant number of breeding pairs from 1987 to 2005, but with peaks and strong decreases approximately every three years since 1995 [67]. An earlier analysis of this population showed a slight decrease of 0.2% per annum between 1979 and 1995 [68]. The population declines observed are thought to be a result of fisheries related mortalities and potential changes in krill abundance [30, 49, 68, 69, 70].

The small population on Macquarie Island remained stable between 1994 and 2007 (Figure 2), and possibly since the 1970s [34]. Although it has been proposed that the Heard Island population increased at all four breeding localities between the first records of 1948 and the most recent census in 2001, from *c.* 200 pairs to *c.* 600 pairs [43], the surveys were not directly comparable between years and hence the population trajectory is uncertain.

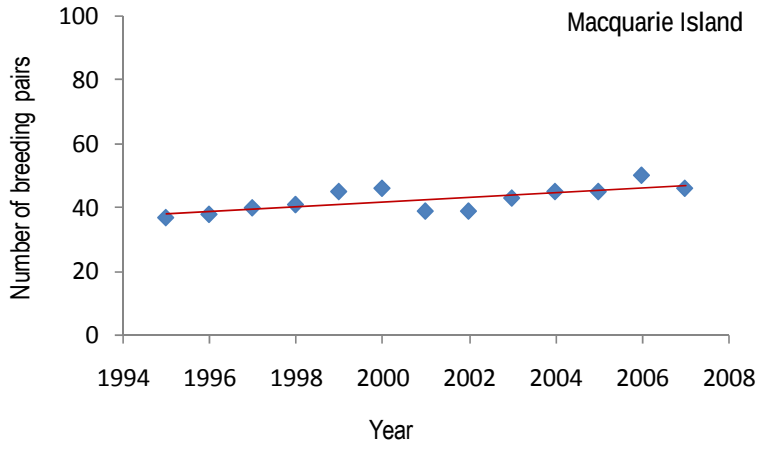

Figure 2. *Counts of the total number of breeding pairs of* T. melanophris *on Macquarie Island with a simple regression line fitted (r^2 =0.547). Figure based on unpublished DPIW data, not to be used without the data holder's permission.*

Table 4. *Summary of population trend data for* T. melanophris. *Table based on unpublished DPIW data (Macquarie Island) and published references as indicated*

Breeding site	Current Monitoring	Trend Years	% average change per year (95% CI) [71]	Trend	% of breeding population
Heard Island	No	-	-	Unknown	100%
Macquarie Island	Yes	1995-2007	1.8 (-0.5, 4.0)	Stable	100%
Isla Diego de Almagro	?	-	-	Unknown	-
Islotes Evangelistas	?	-	-	Unknown	-
Islas Diego Ramirez	?	-	-	Unknown	-
Islas Ildefonso	?	-	-	Unknown	-
Islote Albatros	No	-	-	Unknown	-
Islote Leonard	No	-	-	Unknown	-
Falkland Islands (Islas Malvinas)	?	2000-2005	-0.72 [49]	Declining	100%
Beauchêne Island	?	1981-1996	-	Stable [41]	100%
South Georgia (Islas Georgias del Sur)					
Bird Island	Yes	1977-1996	-1.8 [30]	Declining	*c*. 10%
		1990-2004	-4.0 [50]	Declining	100%
Iles Crozet	No	-	-	Unknown	-
Iles Kerguelen	Yes	1979-1995	-0.2 [68]	Slight Decline	*c*. 10%
		1987-2005	-	Stable [67]	*c*. 10%
Antipodes Islands	?	-	-	Unknown	-
Campbell Islands	?	-	-	Unknown	-

Breeding success and survival data for *T. melanophris* have been collected at several sites (Table 5). Although annual breeding success at Iles Kerguelen was the highest reported for all sites, the number of chicks per egg laid has been declining gradually since 1997 [67]. Positive sea-surface temperature anomalies at the species' wintering ground around Tasmania were identified to have a negative impact on this demographic parameter while positive sea-surface temperature anomalies and trawl fishery operations during the breeding period had a positive effect [67, 72]. Extremely low or nil breeding success in some years at South Georgia (Islas Georgias del Sur) has also been linked to periods of low prey availability in the krill-based trophic system of that region of the Southern Ocean [73].

Juvenile survival at Macquarie Island and one pre-1998 estimate for Bird Island, South Georgia (Islas Georgias del Sur), were higher than those reported for Iles Kerguelen (Table 5). However, at one colony on Bird Island, survival to five years of age decreased from 23.4% during 1976-1981 to 15.0% for the 1982-1986 cohorts [30], possibly as a result of changes in the distribution of the pelagic tuna fisheries off south-west and south-east South Africa during that period [30]. The most recent long-term adult survival estimates are comparable between all sites for which data are available, and are relatively low compared with those for other albatross species [74].

Table 5. Summary of d*emographic data for* T. melanophris. *Table based on unpublished DPIW data (Macquarie Island); Falklands Conservation data (Falkland Islands/Islas Malvinas); P. Catry, Eco-Ethology Research Unit, Instituto Superior de Psicologia Aplicada and New Island Conservation Trust data (New Island); British Antarctic Survey (BAS) data (South Georgia/Islas Georgias de Sur); and Centre d'Etudes Biologiques de Chizé, CNRS data (Iles Kerguelen), and published references as indicated.*

Breeding site	Mean breeding success %/year ±SE/SD and Study period	Mean juvenile survival %/year ±SE/SD and Study period	Mean adult survival %/year ±SE/SD and Study period
Heard and McDonald Islands	No data	No data	No data
Macquarie Island	47.7 ± 10.4 SD (1995-2007)	58.5 ± 5.8 SE (1976-2000) [1] [34]	91.5 ± 1.1 SE (1975-2000) [34]
Isla Diego de Almagro	No data	No data	No data
Islotes Evangelistas	No data	No data	No data
Islas Diego Ramirez	No data	No data	No data
Islas Ildefonso	No data	No data	No data

Islote Albatros	No data	No data	No data
Islote Leonard	No data	No data	No data
Falkland Islands (Islas Malvinas)	46.0 (1990-1995)		
West Point Island	46.5 (2000, 2003)	No data	No data
Saunders Island	52.5 ± 14.4 SD (2004-2009)	No data	No data
New Island		No data	94.0 ± 2.3 SD (2004-2009)
South Georgia (Islas Georgias del Sur)			
Bird Island	34 ± 4 (1976-2005)	23.4 (1976-1981) [2] [30]	91.3 (84.0-98.0, 1976-2002)
	29 ± 5 (1988 -2005)	15.0 (1982-1986) [2] [30]	93.4 ±0.6 (1976-1990) [36]
	27.2 ± 5 (1976-1996) [30]	59.9 (1976-1988) [3] [70]	92.5 ± 0.6 (1976-1988) [30]
		38.5 (1988-1998) [3] [70]	95.7 (1976-1988) [70]
			90.9 (1988-1998) [70]
Iles Crozet	No data	No data	No data
Iles Kerguelen	65.9 ± 10.3 (1986-1994) [67]		
Jeanne d'Arc Peninsula	54.8 ± 14.2 (1992-2003) [4] [72]	28.1 ± 2.1 [2] (1980-2005)	91.8 ±0.4 (1981-2005) [67]
	72.5 ± 11.1 (1992-2003) [5] [72]	13.7 ± 7.2 SD (1979-1995) [68]	76.5 ± 4.9 (1992-2003) [4] [72]
			94.3 ± 1.4 (1993-2003) [5] [72]
	62.7 ± 10.2 (1979-1995) [68]		90.6 ±0.5 SD (1979-1995) [68]
Antipodes Islands	No data	No data	No data
Campbell Island	No data	No data	No data

[1] Survival to first resight
[2] Survival to 5 yrs old
[3] Survival to 3 yrs old
[4] Birds breeding for the first time
[5] Birds breeding for at least the second time

BREEDING SITES: THREATS

Currently, few land-based threats exist which could be considered to cause population level changes at any of the breeding sites of *T. melanophris* (Table 6). At the Falkland Islands (Islas Malvinas) where the largest population of this species is found, 91% of the breeding population is situated on uninhabited islands, which are all protected, and 48% of the population inhabits islands with no introduced predator [49].

Table 6. *Summary of known threats at the breeding sites of* T. melanophris*. Table based on data submitted to the ACAP Breeding Sites Working Group in 2008.*

Breeding site	Human disturbance	Human take	Natural disaster	Parasite or pathogen	Habitat loss or degradation	Predation (alien species)	Contamination
McDonald Island	no	no	Medium [a]	no	no	no	no
Macquarie Island	no	no	no	no	Low [b]	no	no
Isla Diego de Almagro	no	no	no	no	no	no	no
Islotes Evangelistas	no	no	no	no	no	no	no
Islas Diego Ramirez	no	no	no	no	no	no	no
Islas Ildefonso	no	no	no	no	no	no	no
Islote Albatros	no	no	no	no	no	no	no
Islote Leonard	no	no	no	no	no	no	no
Falkland Islands (Islas Malvinas)	no	no [c]	no	no [d]	no	no	no
South Georgia (Islas Georgias del Sur)	no	no	no	no	no	no	no
Iles Crozet	no	no	no	no	no	no	no
Iles Kerguelen	no	no	no	no	no	Low [e]	no

Antipodes Islands	no	no	no	no	no	no	no
Campbell Islands	no	no	no	no	no	no	no

[a] Recent large-scale eruptions (2003-2004 in particular) may have caused most birds to desert nesting sites.

[b] The explosion in European rabbit *Oryctolagus cuniculus* numbers since 1999 has led to an extensive destruction of habitat and soil erosion at nesting sites [58, 59]. An eradication programme which also targets rodents commenced in 2010 [59] but had to be abandoned due to exceptionally poor weather. It will recommence in 2011.

[c] Egg collection was prohibited in 2004 [75].

[d] Avian pox virus was identified at an unknown colony in 1987, with no records since [49].

[e] Cats *(Felis catus)* are thought to impact on *T. melanophris* colonies at Jeanne d'Arc Peninsula.

FORAGING ECOLOGY AND DIET

Thalassarche melanophris feeds by surface seizing [76] but is able to dive to 4.5 metres [77]. This species frequently associates in large numbers with commercial fishing operations [78, 79, 80, 81, 82]. Typically, fish, cephalopods, and in some areas crustaceans, comprise the majority of the *T. melanophris* diet in terms of frequency of occurrence and fresh mass [83] but proportions of these three taxa can vary considerably between years. In addition, penguin carrion is important on Iles Crozet and Kerguelen [32, 84, 85].

At South Georgia (Islas Georgias del Sur), fish represented 30% and 72% of the diet by fresh mass (47% and 76% of samples) during chick-rearing in 1986 and 1994 respectively [86]. In 1986, *Patagonotothen guntheri* (51% of estimated fish biomass, probably obtained from a commercial fishery) and *Icichthys australis* (40%) were the main prey species. In contrast, krill-feeding bentho-pelagic icefish characteristic of the waters of the South Georgia Shelf, *Pseudochaenichthys georgianus* (57% estimated fish biomass), *Magnisudis prionosa* (30%) and *Champsocephalus gunnari* (12%) represented the main fish prey in 1994 when the commercial fishery was no longer operating [86]. Crustaceans formed a large proportion of the diet in 1986 (39% by mass) but not in 1994 (4.7% mass), while squid were consistently prominent [86]. Crustaceans (*Euphausia superba*) were again the main component at Bird Island during chick-rearing between 1996 and 2000 (30-63% by mass), followed by cephalopods (7-48%, most important species in 1997, 1998, and 2000 *Kondakovia longimana,* in 1996 *Martialia hyadesi*, and in 1999 *Moroteuthis knipovitchi*), and fish (19-40%, mainly *C. gunnari*) [73]. Other studies at South Georgia (Islas Georgias del Sur) [87, 88] revealed the diet was evenly split between krill, fish and squid.

During chick-rearing at the Falkland Islands (Islas Malvinas), *T. melanophris* was reported to utilise commercially exploited species of squid and fish, such as *Loligo gahi* and southern blue whiting, *Micromesistius australis* [80]. Fish (mainly *M. australis* and an unidentified species) accounted for between 32 to 68% of diet by mass, whereas squid (mainly *Loligo* and *Illex* species) and krill were more variable between different localities and years [80]. Breeding *T. melanophris* on Beauchene Island derive up to 15% of their food requirements during chick rearing from *Loligo* trawlers [80]. When combined with discards from finfish trawling vessels, the energy obtained was estimated to equal 5.4% of the annual Falkland Islands (Islas Malvinas) breeding population requirements [79].

On Iles Crozet, fish (58.3% of samples), followed by squid (41.7%) and carrion (41.7%) comprised the diet [32]. Fish also dominated the diet of Kerguelen birds rearing chicks (73% of fresh mass, 89.5% of samples), with penguin carrion (14% fresh mass) and cephalopods (10% fresh mass, mainly *Todarodes* sp., *M. hyadesi*, and *Benthoctopus thielei*) as the other main food items [84]. Of the 21 species of fish identified, the most prevalent were *Dissostichus eleginoides* (18.3% reconstituted mass), *Channichthys rhinoceratus* (16.9%) and *Lepidonotothen squamifrons* (11.6%) [84]. Fishery waste was only a minor component of the diet [84]. Similar species assemblages were identified in the diet of chick-rearing *T. melanophris* on Iles Nuageuses which was divided almost equally between cephalopods (39% by fresh mass), fish (31%) and penguins (31%) [85].

MARINE DISTRIBUTION

Thalassarche melanophris has a circumpolar distribution, ranging from subtropical to polar waters, with the majority of breeding birds found in the subantarctic zone, and the majority of non-breeding birds occurring in subtropical as well as subantarctic waters. *Thalassarche melanophris* tend to prefer shallow (<1000 m) waters but they also frequently forage in deeper waters in association with the polar front or other oceanic frontal systems [89, 90, 91].

Breeding birds from all major populations have been tracked but information is lacking for some breeding stages in most areas. During incubation, breeding *T. melanophris* tend to remain in areas either adjacent to or to the north of their colonies (within ~3500 km), in shelf, shelf-break and shelf-slope waters, and, to a lesser extent, adjacent oceanic waters (Figure 3). The majority of the world's population is found on the Patagonian Shelf south of 40°, off the Chilean coast south of 34°, and in the eastern Bass Strait, with important concentrations around South Georgia (Islas Georgias del Sur), Crozet and Kerguelen [90, 92, 93, 94, G. Roberson & J. Arata unpublished data, 95]. In addition, birds from South Georgia (Islas Georgias del Sur) travel to deep oceanic waters of the Brazil-Malvinas Confluence, off the Río de la Plata, Argentina [90]. Although satellite-tracking data showed that incubating *T. melanophris* from Macquarie Island foraged principally in the EEZ around the island, some foraging also extended south to waters adjacent to the ice edge [95]. During chick-rearing, breeding *T. melanophris* initially stay in shelf to shelf-slope areas very close to their colonies (within *c*. 500 km) [90, J. Arata & H. Weimerskirch, unpublished data]. Later, birds from Chile and South Georgia (Islas Georgias del Sur) may also travel up to *c*. 3000 km from their breeding sites, especially to the Antarctic Peninsula and South Orkney Islands, but birds from the Falkland Islands (Islas Malvinas) and Kerguelen continue to remain close to their colonies [90, 91, 92, 93, 94, J. Arata unpublished data, 96]. Some adjacent populations of *T. melanophris* forage in partially mutually exclusive areas, which may fall under the jurisdiction of different RFMOs [93, 97, 98].

Band recoveries and tracking data indicate that post-breeding birds disperse to distinct areas (Figure 4). The majority of Falkland Islands (Islas Malvinas) birds are resident on the Patagonian Shelf throughout the year, remaining largely within the core foraging area of incubating birds, to the northwest of the islands. It is possible that this population does not need to migrate because productivity is high on the Patagonian Shelf year round [99]. During the winter, the Humbolt Upwelling off the Chilean coast holds large numbers of *T. melanophris* [100]. Birds from South Georgia (Islas Georgias del Sur) migrate primarily northeast across the South Atlantic to the coastal shelf of South Africa and the Benguela Current area, with small proportions wintering on the Patagonian Shelf or around Australia [89, 96, 101]. Birds from Kerguelen winter mainly in waters around southern Australia [41].

Very little is known about the distribution of immature *T. melanophris.* However, fledglings from the Falkland Islands (Islas Malvinas) disperse to continental shelf waters off southern Brazil [102].

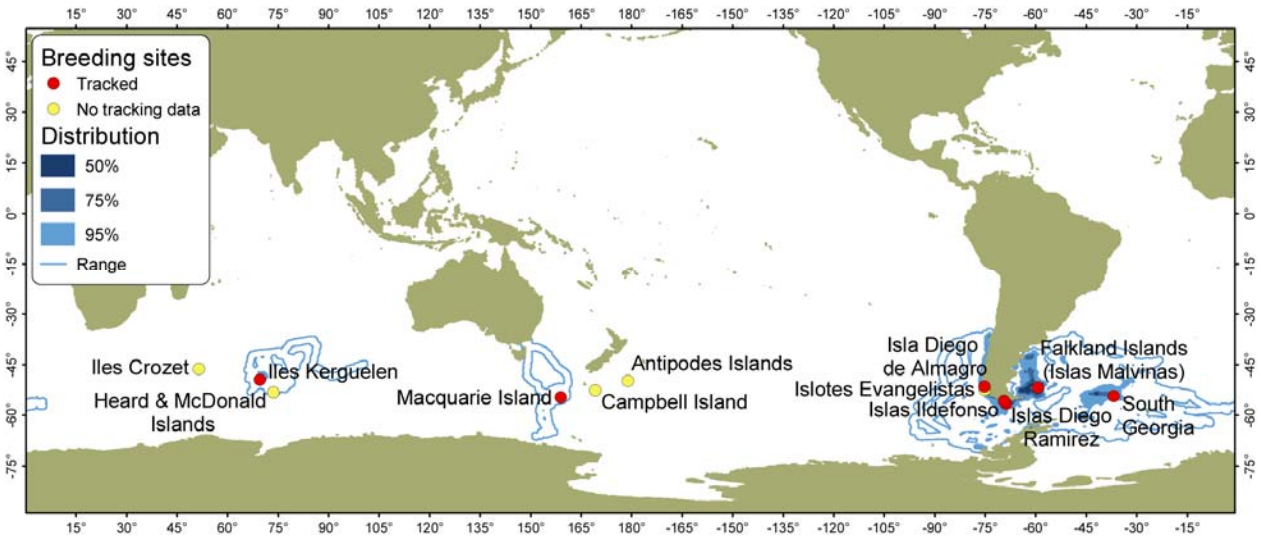

Figure 3. *Satellite-tracking data from breeding adult* T. melanophris *(Number of tracks = 769). Map based on data contributed to the BirdLife Global Procellariiform Tracking Database*.

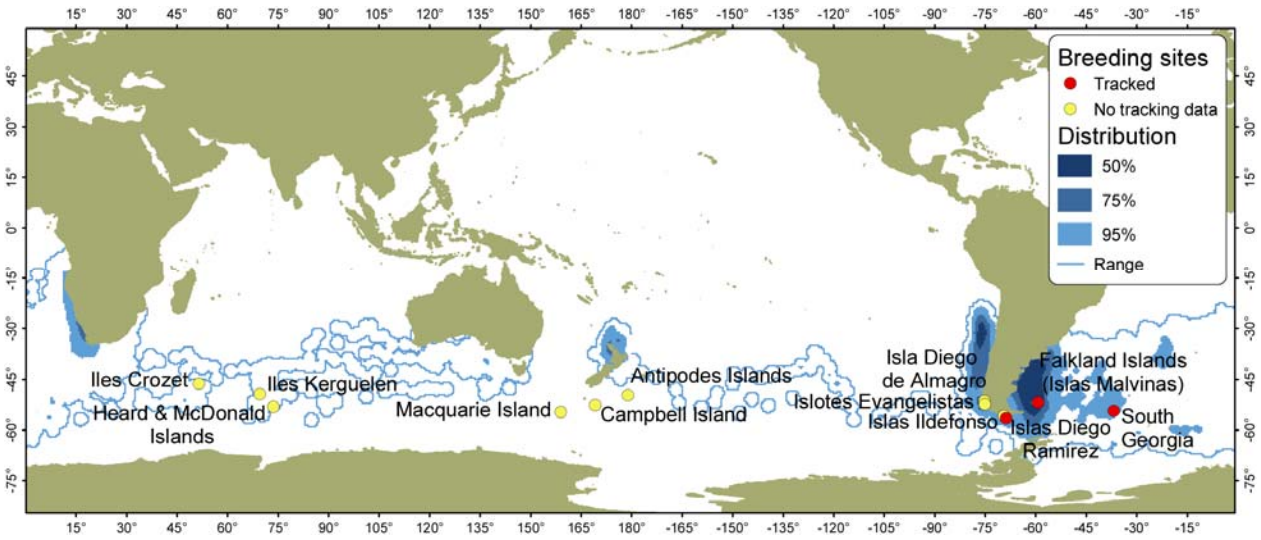

Figure 4. *Tracking data from non-breeding adult* T. melanophris *(Number of tracks = 17 PTT + 157 GLS). Map based on data contributed to the BirdLife Global Procellariiform Tracking Database*.

Due to its circumpolar distribution, *T. melanophris* overlaps with all major Regional Fisheries Management Organisations (Figure 1, Table 7), including those aimed at ensuring the long-term conservation and sustainable use of fishery resources other than tuna: SWIOFC (South-West Indian Ocean Fisheries Commission), SIOFA (Southern Indian Ocean Fisheries Agreement), and SEAFO (South-East Atlantic Fisheries Organisation), as well as the yet to be established South Pacific Regional Fisheries Management Organisation (SPRFMO). This species also has a particularly high vagrancy rate compared with other albatrosses, with records from all countries around the North Atlantic and from as far north as Kenya in the Indian Ocean.

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

	Breeding and feeding range	Foraging range only	Few records - outside core foraging range
Known ACAP Range States	Australia Chile Disputed [1] France New Zealand	Argentina Brazil Peru South Africa UK Uruguay	Ecuador
Exclusive Economic Zones of non-ACAP countries	-	Namibia	Angola
Regional Fisheries Management Organisations[2]	CCAMLR CCSBT WCPFC SPRFMO	IOTC IATTC ICCAT SEAFO SWIOFC SIOFA	-

[1] See Table 2 footnote
[2] See Figure 1 and text for list of acronyms

MARINE THREATS

The distribution of *T. melanophris* overlaps with a number of major fisheries; consequently it is one of the most common bycatch species in many fishery operations throughout its range [78, 81, 82, 103, 104], including longliners targeting tuna *Thunnus* spp. off southern Africa [105], the pelagic longline Swordfish *Xiphias gladius* fishery off Chile [106], the Brazilian domestic pelagic longline fishery in the southwestern Atlantic (55% of all birds, predominantly during winter and spring at a rate of 0.126 birds/1000 hooks killed between 2001-2004) [82], and Argentine longliners targeting toothfish and Kingclip *Genypterus blacodes* on the Patagonian Shelf [107, 108] (57% of bycatch between 1999 and 2001 with 10,000 birds killed during the study period at an estimated rate of 0.04 birds/1000 hooks [108]). In contrast, the fairly recent longline fishery for toothfish in the Kerguelen Exclusive Economic Zone showed little overlap with foraging grounds [84] and with relatively low numbers caught [109] did not appear to affect either adult survival or breeding success [67]. Adult survival was however depressed as a result of the considerable longlining effort for tuna by Japanese and Taiwanese vessels around southern Australia between 1981 and 2004 [67].

Although longlining operations have been known to present the main threat for some time, interactions with trawl fisheries have been identified recently as another major source of mortality [110]. In 2002/2003, the estimated yearly bycatch of *T. melanophris* by finfish trawlers within Falkland Islands (Islas Malvinas) waters was 1411 birds [110]. It is likely that given the level of finfish effort in the last 10 years, the decline of the Falkland Island population could be attributed to this fishery and the large trawling fleet operating on the Patagonian Shelf in general [110]. In comparison, bycatch levels in the Patagonian toothfish longline operations in Falkland Island (Islas Malvinas) waters were relatively low, with an estimated 126 *T. melanophris* killed in the fishery in 2001-2002, much lower than previous estimates for the area, and thought to be the result of more extensive use of effective mitigation measures [111].

Thalassarche melanophris is also killed in the deep-water hake (*Merluccius paradoxus* and *M. capensis*) trawl fishery in South African waters during winter, representing 37% of all birds killed at a rate of 0.30 individuals per tow, with an estimate of at least 5000 *T. melanophris* killed annually across this fleet [112]. The species has also been reported in large numbers around high-sea hake trawl vessels in the Golfo San Jorge, Argentina, with an unquantified number of birds observed struck by the warp cable and drowned while feeding on discards [81].

KEY GAPS IN SPECIES ASSESSMENT

Thalassarche melanophris is one of the more comprehensively studied albatross species; however, information on population trends and demographic parameters is limited for a number of sites, including the largest populations on the Falkland Islands (Islas Malvinas) and colonies in Chile. Census data are more than 10 years old for several sites, while for others, census activities have commenced only very recently and further regular demographic studies using comparable methodologies are required in order to detect population trends or changes in adult and juvenile survival.

While data on the distribution of breeding birds from all major population centres have been collected, there is a considerable lack of knowledge about the distribution of immature and non-breeding birds, especially those from Chilean colonies. Given the threats to this species are predominately sea-based, with large populations decreasing and the status of many populations unknown, there is an urgent need to better assess overlap with fishing operations and document levels of bycatch so that programmes and mitigation measures can be targeted. Finfish trawling fleets on the Patagonian Shelf and off South Africa, as well as pelagic longline fisheries in the southwestern Atlantic are amongst those requiring urgent attention.

REFERENCES

1. Nunn, G.B., Cooper, J., Jouventin, P., Robertson, C.J.R., and Robertson, G.G. 1996. Evolutionary relationships among extant albatrosses (Procellariiformes: Diomedeidae) established from complete cytochrome-*b* gene sequences. *Auk* 113: 784-801.
2. Robertson, C.J. and Nunn, G.B., 1998. *Towards a new taxonomy for albatrosses*, in *Albatross biology and conservation.* G. Robertson and R. Gales (Eds). Surrey Beatty & Sons: Chipping Norton. pp 13-19.
3. BirdLife International. 2008. *Species factsheet: Thalassarche melanophrys.* www.birdlife.org.
4. ACAP. *Agreement on the Conservation of Albatrosses and Petrels. http://www.acap.aq*.
5. ICZN. 2010. OPINION 2252 (Case 3449) *Diomedea melanophris* Temminck, 1828 (currently *Thalassarche melanophris*; Aves, Procellariiformes): original spelling of specific name conserved. *Bulletin of Zoological Nomenclature* 67: 194-196.
6. IUCN. 2010. *2010 IUCN Red List of Threatened Species*. www.iucnredlist.org.
7. Bonn Convention. *Convention on the Conservation of Migratory Species of Wild Animals*. http://www.cms.int/.
8. Australian Government. 1999. *Environment Protection and Biodiversity Conservation Act 1999*. http://www.comlaw.gov.au/comlaw/management.nsf/lookupindexpagesbyid/IP200401830?OpenDocument.
9. Department of Environment and Heritage. 2001. *Recovery Plan for Albatrosses and Giant-Petrels 2001-2005*. http://www.deh.gov.au/biodiversity/threatened/publications/recovery/albatross/index.html.
10. Department of Environment and Heritage. 2006. *Threat Abatement Plan for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations* http://www.environment.gov.au/biodiversity/threatened/tap-approved.html.
11. Department of Environment and Climate Change. 2005. *Threatened Species Conservation Act, 1995, New South Wales*. http://www.legislation.nsw.gov.au/viewtop/inforce/act+101+1995+FIRST+0+N.
12. Tasmanian Government. *Threatened Species Protection Act (1995)*. http://www.dpiw.tas.gov.au/.
13. Department of Environment and Conservation. 2008. Wildlife Conservation Act 1950 - Wildlife Conservation (Specially Protected Fauna) Notice 2008(2). *Western Australian Government Gazette* 134: 3477-3485.
14. Ministério do Meio Ambiente. 2003. *Lista Nacional das Espécies da Fauna Brasileira Ameaçadas de Extinção*. http://www.mma.gov.br/port/sbf/fauna/index.cfm.
15. Neves, T., Peppes, F., and Mohr, L.V. 2006. *National plan of action for the conservation of albatrosses and petrels (NPOA-Seabirds Brazil).* Threatened Species Series No. 2. 128 pp.
16. Subsecretaría de Pesca. 2006. *Plan de Acción Nacional para reducir las capturas incidentales de aves en las pesquerías de palangre (PAN-AM/CHILE).* 26 pp. www.subpesca.cl/mostrararchivo.asp?id=5768
17. Falkland Islands Government. 1999. *Conservation of Wildlife and Nature Bill 1999.* The Falkland Islands Gazette. Supplement 10(13). http://www.falklandconservation.com/wildlife/conbill.html
18. Falkland Islands Government. 2005. *Fisheries (Conservation and Management) Ordinance 2005*. Falkland Islands Government and Falklands Conservation: Stanley.
19. Falklands Conservation. 2004. *Falkland Islands FAO National Plan of Action for Reducing Incidental Catch of Seabirds In Longline Fisheries 2004.* Unpublished report to the Royal Society for the Protection of Birds (RSPB), UK.

20. Gouvernement de la République Française. 1998. Arrêté du 14 août 1998 fixant sur tout le territoire national des mesures de protection des oiseaux représentés dans les Terres australes et antarctiques françaises. *Le Journal Officiel de la République Française n°236 du 11 octobre 1998.* p. 15405 http://www.legifrance.gouv.fr/home.jsp
21. New Zealand Government. *New Zealand Wildlife Act 1953, No 31*. http://www.legislation.govt.nz/act/public/1953/0031/latest/DLM276814.html?search=ts_act_wildlife_resel&sr=1.
22. Taylor, G.A. 2000. *Action Plan for Seabird Conservation in New Zealand. Part B: Non-Threatened Seabirds.* Threatened Species Occasional Publication No. 17. Biodiversity Recovery Unit. Department of Conservation. Wellington.
23. Miskelly, C.M., Dowding, J.E., Elliott, G.P., Hitchmough, R.A., Powlesland, R.G., Robertson, H.A., Sagar, P.M., Scofield, R.P., and Taylor, G.A. 2008. Conservation status of New Zealand birds, 2008. *Notornis* 55: 117-135.
24. South African Government. 1973. Sea Birds and Seals Protection Act, 1973 (Act No. 46 of 1973). http://www.mcm-deat.gov.za/regulatory/seals_seabirds.html
25. Department of Environmental Affairs and Tourism. South African Government. 2007. The Sea Birds and Seals Protection Act, 1973 (Act No. 46 of 1973); Publication of Policy on the Management of Seals Seabirds and Shorebirds. *Government Gazette* 510: 3.
26. Department of Environmental Affairs and Tourism. 2008. *South Africa National Plan of Action for Reducing the Incidental Catch of Seabirds in Longline Fisheries.* Department of Environmental Affairs and Tourism: Cape Town. 32 pp.
27. Government of South Georgia and the South Sandwich Islands. 1975. *Falkland Islands Dependencies Conservation Ordinance (1975)*. http://www.sgisland.gs.
28. Varty, N., Sullivan, B.J., and Black, A.D. 2008. *FAO International Plan of Action-Seabirds: an assessment for fisheries operating in South Georgia and South Sandwich Islands.* BirdLife International Global Seabird Programme. Royal Society for the Protection of Birds. ,The Lodge, Sandy, Bedfordshire, UK. 96 pp.
29. Domingo, A., Jiménez, S., and Passadore, C. 2007. *Plan de acción nacional para reducir la captura incidental de aves marinas en las pesquerías uruguayas.* Dirección Nacional de Recursos Acuáticos. Montevideo. 76 pp. http://www.dinara.gub.uy/web_dinara/index.php?option=com_content&view=article&id=77&Itemid=111
30. Croxall, J.P., Prince, P.A., Rothery, P., and Wood, A.G., 1998. *Population changes in albatrosses at South Georgia*, in *Albatross Biology and Conservation.* G. Robertson and R. Gales (Eds). Surrey Beatty & Sons: Chipping Norton. 69-83.
31. Copson, G.R. 1988. The status of the black-browed and grey-headed albatrosses on Macquarie Island. *Papers and Proceedings of the Royal Society of Tasmania* 122: 137-141.
32. Weimerskirch, H., Jouventin, P., and Stahl, J.C. 1986. Comparative Ecology of the 6 Albatross Species Breeding on the Crozet Islands. *Ibis* 128: 195-213.
33. Tickell, W.L.N. and Pinder, R. 1975. Breeding biology of the black-browed albatross *Diomedea melanophris* and grey-headed albatross *D. chrysostoma* at Bird Island, South Georgia. *Ibis* 117: 433-451.
34. Terauds, A., Gales, R., and Alderman, R. 2005. Trends in numbers and survival of black-browed (*Thalassarche melanophrys*) and Grey-headed (*T. chrysostoma)* Albatrosses breeding on Macquarie Island. *Emu* 105: 159-167.
35. Weimerskirch, H., Zotier, R., and Jouventin, P. 1989. The avifauna of the Kerguelen Islands. *Emu* 89: 15-29.

36. Prince, P.A., Rothery, P., Croxall, J.P., and Wood, A.G. 1994. Population dynamics of black-browed and grey-headed albatrosses *Diomedea melanophris* and *D. chrysostoma* at Bird Island, South Georgia. *Ibis* 136: 50-71.
37. Prince, P.A., Rodwell, S.P., Jones, M., and Rothery, P. 1993. Moult in black-browed and grey-headed albatrosses *Diomedea melanophris* and *D. chrysostoma*. *Ibis* 135: 121-131.
38. Aguayo, A., Acevedo, J., and Acuña, P. 2003. Nuevo sitio de anidamiento del Albatros de ceja negra, *Diomedea melanophris* Temmink 1828, en el Seno Almirantazgo, Tierra del Fuego, Chile. *Anales Instituto Patagonia (Chile)* 31: 91-96.
39. Marin, M. and Oehler, D. 2007. A new breeding colony of black-browed albatross (*Thalassarche melanophys*) for Chile. *Anales Instituto Patagonia (Chile)* 35: 29-33.
40. Miskelly, C.M. 1997. *Biological notes on the Western Chain, Snares Islands, 1984/85 and 1985/86.* Conservation Advisory Science Notes. Department of Conservation. No. 144. Wellington.
41. Gales, R., 1998. *Albatross populations: status and threats*, in *Albatross Biology and Conservation.* G. Robertson and R. Gales (Eds). Surrey Beatty & Sons: Chipping Norton. pp 20-45.
42. Strange, I.J. 2008. *Aerial surveys of Black-browed Albatross Thalassarche melanophris breeding colonies in the Falkland Islands: the methodology employed and comparisons with surveys carried out in 1986-2005 and 2007.* Design in Nature. Falkland Islands. 60 pp.
43. Woehler, E.J., Auman, H.J., and Riddle, M.J. 2002. Long-term population increase of black-browed albatrosses *Thalassarche melanophrys* at Heard Island, 1947/1948-2000/2001. *Polar Biology* 25: 921-927.
44. Lawton, K., Robertson, G., Valencia, J., Weinecke, B., and Kirkwood, R. 2003. The status of black-browed albatrosses *Thalassarche melanophrys* at Diego de Almagro Island, Chile. *Ibis* 145: 502-505.
45. Arata, J., Robertson, G., Valencia, J., and Lawton, K. 2003. The Evangelistas Islets, Chile: a new breeding site for black-browed albatrosses. *Polar Biology* 26: 687-690.
46. Robertson, G., Moreno, C.A., Lawton, K., Arata, J., Valencia, J., and Kirkwood, R. 2007. An estimate of the population sizes of black-browed (*Thalassarche melanophrys*) and grey-headed (*T. chrysostoma*) albatrosses breeding in the Diego Ramirez Archipelago, Chile. *Emu* 107: 239-244.
47. Robertson, G., Moreno, C.A., Lawton, K., Kirkwood, R., and Valencia, J. 2008. Comparison of census methods for black-browed albatrosses breeding at the Ildefonso Archipelago, Chile. *Polar Biology* 31: 153-162.
48. Godoy, N., Bahamondes, J., and Castilla, J.C. 2007. *Expedición al Seno Almirantazgo, Tierra del Fuego, Chile.* Facultad de Ciencias Biológicas, Pontificia Universidad Católica de Chile. Unpublished Report to the Wildlife Conservation Society.
49. Huin, N. and Reid, T. 2007. *Census of the Black-browed Albatross Population of the Falkland Islands.* Falklands Conservation. 44.
50. Poncet, S., Robertson, G., Phillips, R., Lawton, K., Phalan, B., Trathan, P., and Croxall, J. 2006. Status and distribution of wandering, black-browed and grey-headed albatrosses breeding at South Georgia. *Polar Biology* 29: 772-781.
51. Jouventin, P., Stahl, J.C., Weimerskirch, H., and Mougin, J.L., 1984. *The seabirds of French Subantarctic Islands & Adélie Land, their status and conservation*, in *Status and conservation of the world's seabirds.* J.P. Croxall, P.J.H. Evans, and R.W. Schreiber (Eds). International Council for Bird Preservation Technical Publication No. 2. Cambridge. 609-625.
52. Tennyson, A., Imber, M., and Taylor, R. 1998. Numbers of black-browed mollymawks (*Diomedea m. melanophrys*) and white-capped mollymawks (*D. cauta steadi*) at the Antipodes Islands in 1994-95 and their population trends in the New Zealand region. *Notornis* 45: 157-166.

53. United Nations Educational Scientific and Cultural Organzation. *World Heritage List*. http://whc.unesco.org/en/list.
54. UNESCO's Man and the Biosphere Programme (MAB) - Maquarie Island. http://www.unesco.org/mabdb/br/brdir/directory/biores.asp?mode=all&code=AUL+03.
55. Ramsar Convention on Wetlands. http://www.ramsar.org/.
56. Australian Government. Department of the Environment, Water, Heritage, and the Arts. *Register of the National Estate (RNE)*. http://www.environment.gov.au/heritage/places/rne/index.html.
57. Tasmanian Government. Nature Conservation Act 2002. http://www.parks.tas.gov.au/manage/parksres/reserves.html.
58. Parks and Wildlife Service. 2006. *Macquarie Island Nature Reserve and World Heritage Area Management Plan.* Parks and Wildlife Service, Department of Tourism, Arts and the Environment. Hobart.
59. Parks and Wildlife Service and Biodiversity Conservation Branch. 2007. *Plan for the Eradication of Rabbits and Rodents on Subantarctic Macquarie Island.* Department of Tourism, Arts and the Environment & Department of Primary Industries and Water. Hobart.
60. Gouvernement de la République Française. 2006. Décret n°2006-1211 du 3 octobre 2006 portant création de la Réserve Naturelle des Terres Australes Françaises*. Journal Officiel de la République Française n°230 du 4 octobre 2006.* p.14673*.* http://www.legifrance.gouv.fr/home.jsp
61. Terres Australes et Antarctiques Françaises. 1985. *Arrêté n°14 du 30 Juillet 1985 relatif à la création de zones réservées à la recherché scientifique et technique dans les TAAF. Mises à jour / extensions : Décisions n°2006 – 22, n°108 du 16 juin 1989, n°147 du 13 septembre 1990, du 19 juillet 1991 ; arrêté 2002 - 42 du 18 décembre 2002*. http://www.taaf.fr/spip/spip.php?article354.
62. New Zealand Government. 1977. *New Zealand Reserves Act 1977*. http://www.legislation.govt.nz/.
63. Department of Conservation. 1988. *Conservation Management Strategy: Subantarctic Islands 1998-2008.* Southland Conservancy Conservation Management Planning Series No. 10. Department of Conservation. Invercagill. 114 pp.
64. McIntosh, E. and Walton, D.W.H. 2000. *Environmental Management Plan for South Georgia.* Published by the British Antarctic Survey on behalf of the Government of South Georgia and South Sandwich Islands. 104pp.
65. Pasteur, E. and Walton, W. 2006. *South Georgia: plan for progress, managing the environment 2006-2010.* . Published by the British Antarctic Survey on behalf of the Government of South Georgia and the South Sandwich Islands. 75pp. http://sgisland.org/pages/gov/PlanProgress.htm
66. Croxall, J.P. and Gales, R., 1998. *An assessment of the conservation status of albatrosses*, in *Albatross Biology and Conservation.* G. Robertson and R. Gales (Eds). Surrey Beatty & Sons: Chipping Norton. 46-65.
67. Rolland, V., Barbraud, C., and Weimerskirch, H. 2008. Combined effects of fisheries and climate on a migratory long-lived marine predator*. Journal of Applied Ecology* 45: 4-13.
68. Weimerskirch, H. and Jouventin, P., 1998. *Changes in population sizes and demographic parameters of six albatross species breeding on the French sub-Antarctic islands*, in *Albatross: Biology and Conservation.* G. Robertson and R. Gales (Eds). Surrey Beatty & Sons: Chipping Norton, NSW, Australia. pp 84-91.
69. Delord, K., Besson, D., Barbraud, C., and Weimerskirch, H. 2008. Population trends in a community of large Procellariiforms of Indian Ocean: Potential effects of environment and fisheries interactions*. Biological Conservation* 141: 1840-1856.
70. Arnold, J.M., Brault, S., and Croxall, J.P. 2006. Albatross populations in peril: A population trajectory for black-browed albatrosses at South Georgia*. Ecological Applications* 16: 419-432.

71. Pannekoek, J. and van Strien, A. 2006. TRIM 3.53 (TRends & Indices for Monitoring data). Statistics Netherlands, Voorburg. http://www.cbs.nl/en-GB/menu/themas/natuur-milieu/methoden/trim/default.htm
72. Nevoux, M., Weimerskirch, H., and Barbraud, C. 2007. Environmental variation and experience-related differences in the demography of the long-lived black-browed albatross. *Journal of Animal Ecology* 76: 159-167.
73. Xavier, J.C., Croxall, J.P., and Reid, K. 2003. Interannual variation in the diets of two albatross species breeding at South Georgia: implications for breeding performance. *Ibis* 145: 593-610.
74. Veran, S., Gimenez, O., Flint, E., Kendall, W.L., Doherty, P.F., and Lebreton, J.D. 2007. Quantifying the impact of longline fisheries on adult survival in the black-footed albatross. *Journal of Applied Ecology* 44: 942-952.
75. Falkland Islands Government 2004. Conservation of Wildlife and Nature (Amendment) Ordinance 2004. *The Falklands Islands Gazette Supplement* 15: 1-3.
76. Harper, P.C. 1987. Feeding behaviour and other notes on 20 species of Procellariiformes at sea. *Notornis* 34: 169-192.
77. Prince, P.A., Huin, N., and Weimerskirch, H. 1994. Diving depths of albatrosses. *Antarctic Science* 6: 353-354.
78. Weimerskirch, H., Capdeville, D., and Duhamel, G. 2000. Factors affecting the number and mortality of seabirds attending trawlers and long-liners in the Kerguelen area. *Polar Biology* 23: 236-249.
79. Thompson, K.R. and Riddy, M.D. 1995. Utilization of Offal and Discards from Finfish Trawlers around the Falkland Islands by the Black-Browed Albatross *Diomedea melanophris*. *Ibis* 137: 198-206.
80. Thompson, K.R. 1992. Quantitative analysis of the use of discards from squid trawlers by black-browed albatrosses *Diomedea melanophris* in the vicinity of the Falkland Islands. *Ibis* 134: 11-21.
81. Gonzalez-Zevallos, D. and Yorio, P. 2006. Seabird use of discards and incidental captures at the Argentine hake trawl fishery in the Golfo San Jorge, Argentina. *Marine Ecology-Progress Series* 316: 175-183.
82. Bugoni, L., Mancini, P.L., Monteiro, D.S., Nascimiento, L., and Neves, T. 2008. Seabird bycatch in the Brazilian pelagic longline fishery and a review of capture rates in the southwestern Atlantic Ocean. *Endangered Species Research* 5: 137-147.
83. Cherel, Y. and Klages, N.T., 1998. *A review of the food of albatrosses*, in *Albatross Biology and Conservation.* G. Robertson and R. Gales (Eds). Surrey Beatty & Sons Pty Ltd: Chipping Norton. pp 113-136.
84. Cherel, Y., Weimerskirch, H., and Trouve, C. 2000. Food and feeding ecology of the neritic-slope forager black-browed albatross and its relationships with commercial fisheries in Kerguelen waters. *Marine Ecology-Progress Series* 207: 183-199.
85. Cherel, Y., Weimerskirch, H., and Trouve, C. 2002. Dietary evidence for spatial foraging segregation in sympatric albatrosses (*Diomedea spp.*) rearing chicks at Iles Nuageuses, Kerguelen. *Marine Biology* 141: 1117-1129.
86. Reid, K., Croxall, J.P., and Prince, P.A. 1996. The fish diet of black-browed albatross *Diomedea melanophris* and grey-headed albatross *D. chrysostoma* at South Georgia. *Polar Biology* 16: 469-477.
87. Prince, P.A. 1980. The food and feeding ecology of grey-headed albatross *Diomedea chrysostoma* and black-browed albatross *Diomedea melanophris*. *Ibis* 122: 476-488.
88. Rodhouse, P.G. and Prince, P.A. 1993. Cephalopod prey of the black-browed albatross *Diomedea melanophrys* at South-Georgia. *Polar Biology* 13: 373-376.
89. Petersen, S.L., Phillips, R.A., Ryan, P.G., and Underhill, L.G. 2008. Albatross overlap with fisheries in the Benguela Upwelling System: implications for conservation and management. *Endangered Species Research* 5: 117-127.

90. Phillips, R.A., Silk, J.R.D., Phalan, B., Catry, P., and Croxall, J.P. 2004. Seasonal sexual segregation in two *Thalassarche* albatross species: competitive exclusion, reproductive role specialization or foraging niche divergence? *Proceedings of the Royal Society of London Series B-Biological Sciences* 271: 1283-1291.
91. Wood, A.G., Naef-Daenzer, B., Prince, P.A., and Croxall, J.P. 2000. Quantifying habitat use in satellite-tracked pelagic seabirds: application of kernel estimation to albatross locations. *Journal of Avian Biology* 31: 278-286.
92. Weimerskirch, H., Mougey, T., and Hindermeyer, X. 1997. Foraging and provisioning strategies of black-browed albatrosses in relation to the requirements of the chick: natural variation and experimental study. *Behavioral Ecology* 8: 635-643.
93. Huin, N. 2002. Foraging distribution of the black-browed albatross, *Thalassarche melanophris*, breeding in the Falkland Islands. *Aquatic Conservation-Marine and Freshwater Ecosystems* 12: 89-99.
94. Pinaud, D. and Weimerskirch, H. 2007. At-sea distribution and scale-dependent foraging behaviour of petrels and albatrosses: a comparative study. *Journal of Animal Ecology* 76: 9-19.
95. Terauds, A., Gales, R., Baker, G.B., and Alderman, R. 2006. Foraging areas of black-browed and grey-headed albatrosses breeding on Macquarie Island in relation to marine protected areas. *Aquatic Conservation: Marine and Freshwater Ecosystems* 16: 133-146.
96. Prince, P.A., Croxall, J.P., Trathan, P.N., and Wood, A.G., 1998. *The pelagic distribution of South Georgia albatrosses and their relationship with fisheries*, in *Albatross Biology and Conservation.* G. Robertson and R. Gales (Eds). Surrey Beatty & Sons: Chipping Norton. pp 137-167.
97. Lawton, K., Kirkwood, R., Robertson, G., and Raymond, B. 2008. Preferred foraging areas of Heard Island albatrosses during chick raising and implications for the management of incidental mortality in fisheries. *Aquatic Conservation-Marine and Freshwater Ecosystems* 18: 309-320.
98. Weimerskirch, H., Bartle, J.A., Jouventin, P., and Stahl, J.C. 1988. Foraging ranges and partitioning of feeding zones in three species of southern albatrosses. *Condor* 90: 214-219.
99. Gremillet, D., Wilson, R.P., Wanless, S., and Chater, T. 2000. Black-browed albatrosses, international fisheries and the Patagonian Shelf. *Marine Ecology-Progress Series* 195: 269-280.
100. Moreno, C.A., Arata, J.A., Rubilar, P., Hucke-Gaete, R., and Robertson, G. 2006. Artisanal longline fisheries in Southern Chile: Lessons to be learned to avoid incidental seabird mortality. *Biological Conservation* 127: 27-36.
101. Phillips, R.A., Silk, J.R.D., Croxall, J.P., Afanasyev, V., and Bennett, V.J. 2005. Summer distribution and migration of nonbreeding albatrosses: Individual consistencies and implications for conservation. *Ecology* 86: 2386-2396.
102. Sullivan, B., Reid, T., Huin, N., Neves, T., and Warlich, R. 2004. *Colour marking of fledgling black-browed albatross on Steeple Jason Island.* Falklands Conservation.
103. Bugoni, L., Neves, T.S., Leite Jr, N.O., Carvalho, D., Sales, G., Furness, R.W., Stein, C.E., Peppes, F.V., Giffoni, B.B., and Monteiro, D.S. 2008. Potential bycatch of seabirds and turtles in hook-and-line fisheries of the Itaipava Fleet, Brazil. *Fisheries Research* 90: 217-224.
104. Neves, T. and Olmos, F., 1998. *Albatross mortality in fisheries off the coast of Brazil*, in *Albatross Biology and Conservation.* G. Robertson and R. Gales (Eds). Surrey Beatty & Sons: Chipping Norton. pp 214-219.
105. Ryan, P.G., Keith, D.G., and Kroese, M. 2002. Seabird bycatch by longline fisheries off southern Africa, 1998-2000. *South African Journal of Marine Science* 24: 103-110.
106. BirdLife Global Seabird Programme. 2008. *Albatross Task Force Annual Report 2007.* Royal Society for the Protection of Birds, The Lodge, Sandy, Bedfordshire, UK.

107. Seco Pon, J.P., Gandini, P.A., and Favero, M. 2007. Effect of longline configuration on seabird mortality in the Argentine semi-pelagic Kingclip *Genypterus blacodes* fishery. *Fisheries Research* 85: 101-105.
108. Favero, M., Khatchikian, C.E., Arias, A., Rodriguez, M.P.S., Canete, G., and Mariano-Jelicich, R. 2003. Estimates of seabird by-catch along the Patagonian Shelf by Argentine longline fishing vessels, 1999-2001. *Bird Conservation International* 13: 273-281.
109. Delord, K., Gasco, N., Weimerskirch, H., Barbraud, C., and Micol, T. 2005. Seabird mortality in the Patagonian toothfish longline fishery around Crozet and Kerguelen Islands, 2001-2003. *CCAMLR Science* 12: 53-80.
110. Sullivan, B.J., Reid, T.A., and Bugoni, L. 2006. Seabird mortality on factory trawlers in the Falkland Islands and beyond. *Biological Conservation* 131: 495-504.
111. Reid, T.A., Sullivan, B.J., Pompert, J., Enticott, J.W., and Black, A.D. 2004. Seabird mortality associated with Patagonian Toothfish (*Dissostichus eleginoides*) longliners in Falkland Islands waters. *Emu* 104: 317-325.
112. Watkins, B.P., Petersen, S.L., and Ryan, P.G. 2008. Interactions between seabirds and deep-water hake trawl gear: an assessment of impacts in South African waters. *Animal Conservation* 11: 247-254.

COMPILED BY

Wiesława Misiak
ACAP Secretariat

CONTRIBUTORS

Ewan Wakefield
British Antarctic Survey

John Croxall
BirdLife International

Anton Wolfaardt
ACAP Officer - UK South Atlantic Overseas Territories

Mark Tasker
Vice-Chair, ACAP Advisory Committee

ACAP Breeding Sites Working Group
Contact: Richard Phillips
raphil@bas.ac.uk

ACAP Status and Trends Working Group
Contact: Rosemary Gales
Rosemary.Gales@dpiw.tas.gov.au

ACAP Taxonomy Working Group
Contact: Michael Double
Mike.Double@aad.gov.au

BirdLife International, Global Seabird Programme
Contact: Cleo Small
Cleo.Small@rspb.org.uk
Maps: Frances Taylor
Tracking Satellite Data contributors: John Croxall, Richard Phillips, Janet Silk, Dirk Briggs, Andy Wood (British Antarctic Survey), Javier Arata (Universidad Austral de Chile), Graham Robertson (Australian Antarctic Division), Nic Huin (Falklands Conservation), Henri Weimerskirch (Centre d'Etudes Biologiques de Chizé), Nigel Brothers, April Hedd, Rosemary Gales, Rachael Alderman (Department of Primary Industries, Water and Environment (DPIWE), Tasmania), Samantha Petersen, Peter Ryan (Percy FitzPatrick Institute).

RECOMMENDED CITATION

Agreement on the Conservation of Albatrosses and Petrels. 2010. ACAP Species assessment: Black-browed Albatross *Thalassarche melanophris.* Downloaded from http://www.acap.aq on 11 October 2010.

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 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.