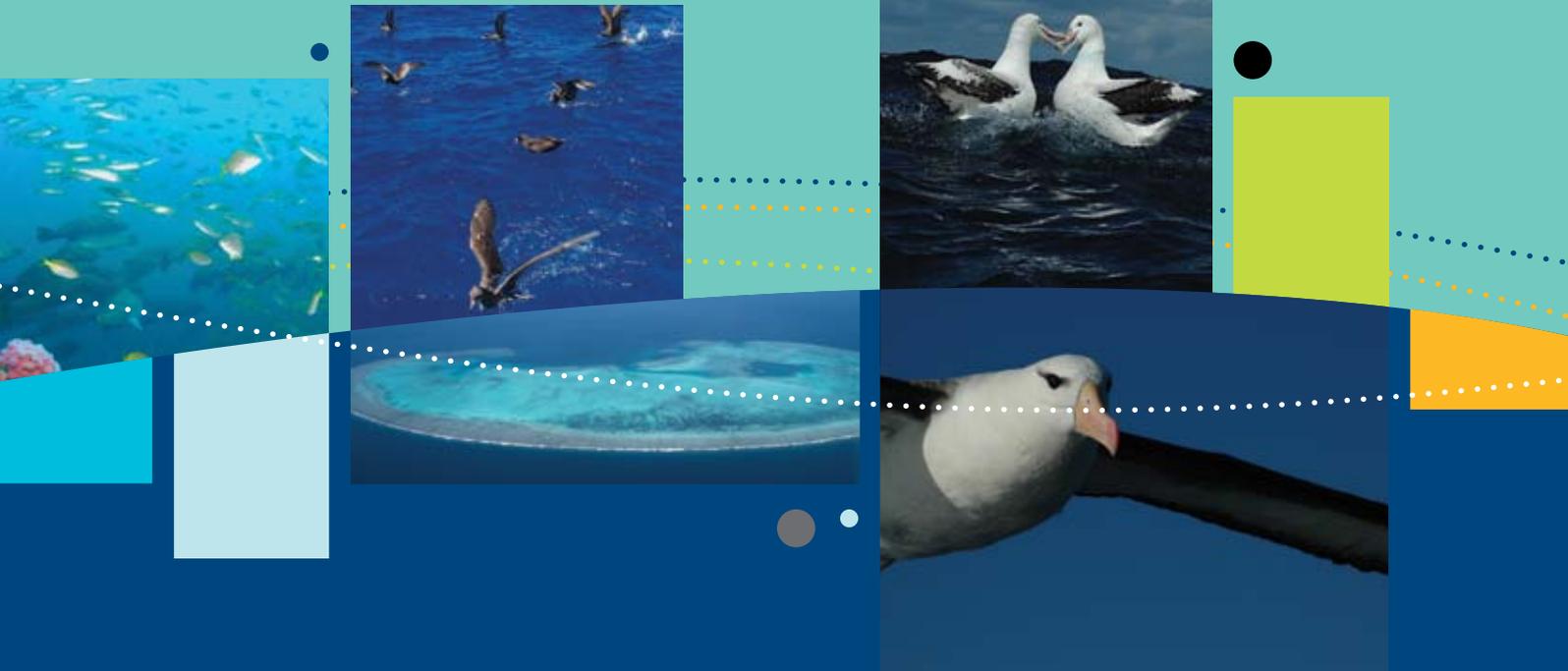




**Australian Government**

**Department of Sustainability, Environment,  
Water, Population and Communities**



# Species group report card – seabirds

Supporting the marine bioregional plan  
for the Temperate East Marine Region

prepared under the *Environment Protection and Biodiversity Conservation Act 1999*

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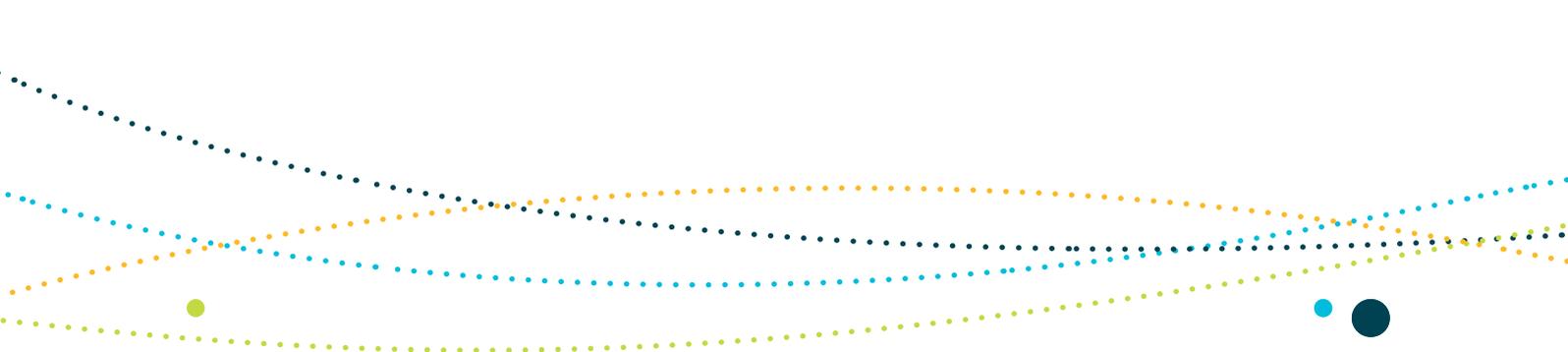
## **Images:**

Flesh-footed shearwater and Balls Pyramid – I.Hutton, Black-browed Albatross – M.Double, Wandering Albatross – M.Double, Middleton Reef from air – Director of National Parks, Pimpnel Rock, Solitary Islands – D.Harasti, Dubois' Sea Snake – GBRMPA, Runic wreck on Middleton Reef – GBRMPA, A Green turtle swims in shallows over reef top – GBRMPA, Blue Devil – D.Harasti, Acropora species – R.Chesher Ph.D



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# SPECIES GROUP REPORT CARD—SEABIRDS

Supporting the marine bioregional plan for the Temperate East Marine Region prepared under the *Environment Protection and Biodiversity Conservation Act 1999*

## Report cards

The primary objective of the report cards is to provide accessible information on the conservation values found in Commonwealth marine regions. This information is maintained by the Department of Sustainability, Environment, Water, Population and Communities and is available online through the department's website ([www.environment.gov.au](http://www.environment.gov.au)). A glossary of terms relevant to marine bioregional planning is located at [www.environment.gov.au/marineplans](http://www.environment.gov.au/marineplans).

Reflecting the categories of conservation values, there are three types of report cards:

- species group report cards
- marine environment report cards
- heritage places report cards.

While the focus of these report cards is the Commonwealth marine environment, in some instances pressures and ecological processes occurring in state waters are referred to where there is connectivity between pressures and ecological processes in state and Commonwealth waters.





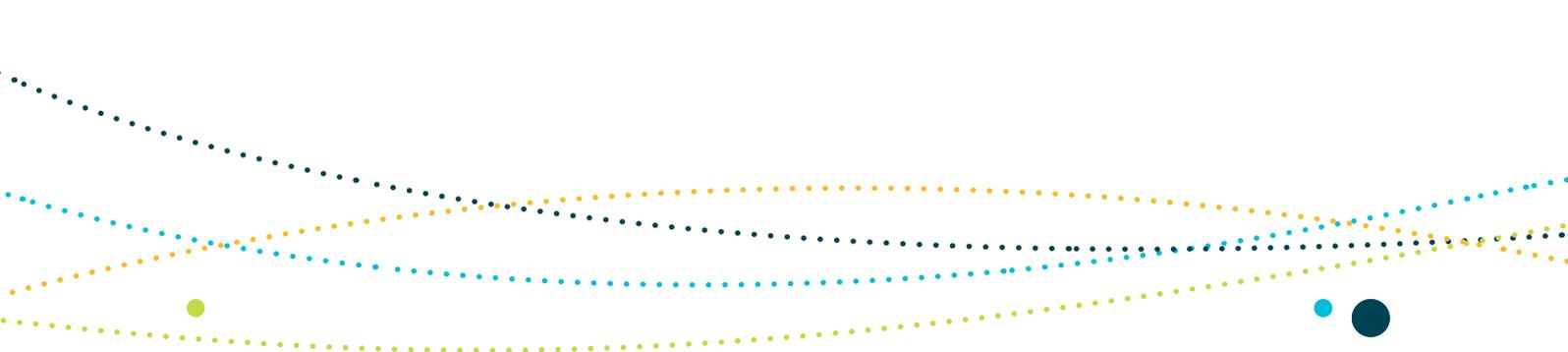
## Species group report cards

Species group report cards are prepared for large taxonomic groups that include species identified as conservation values in a region; that is, species that are listed under Part 13 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and live in the Commonwealth marine area for all or part of their lifecycle. All listed threatened, migratory and marine species and all cetaceans occurring in Commonwealth waters are protected under the EPBC Act and are identified in the relevant marine bioregional plans as conservation values.

Species group report cards focus on species for which the region is important from a conservation perspective; for example, species of which a significant proportion of the population or an important life stage occurs in the region's waters.

For these species, the report cards:

- outline the conservation status of the species and the current state of knowledge about its ecology in the region
- define biologically important areas; that is, areas where aggregations of individuals of a species display biologically important behaviours
- assess the level of concern in relation to different pressures.



## 1. Seabirds of the Temperate East Marine Region

The Temperate East Marine Region supports important breeding and foraging areas for seabirds; in particular, the Lord Howe Island and Norfolk Island groups are recognised both nationally and internationally as significant breeding sites (Dutson et al. 2009). Oceanographic features within the region like the East Australian Current and Tasman Front drive sites of enhanced biological productivity, offering important foraging opportunities for both resident and migratory species (DEWHA 2009a). As significant consumers of marine resources, seabirds play an important functional role in marine ecosystems; for example, by transferring nutrients from pelagic and offshore regions to islands, reefs and coasts; and dispersing seeds and moving organic matter through the soil layers, particularly by burrow-nesting species (Congdon et al. 2007).

In total, 53 listed seabird species are known to occur in the Temperate East Marine Region. This report card considers 34 of those species which include albatrosses, petrels, shearwaters, terns, boobies and tropicbirds (see Table A1, Attachment A). The species were selected after considering their conservation status; distribution and population structure within the region; life history characteristics; and the potential for the population(s) in the region to be genetically distinct from populations elsewhere. Species that occur infrequently in the region (see Table A2, Attachment A), or overfly the region during migration have not been considered. Taxonomic names used follow Christidis and Boles (2008), except for the albatross species, which follow the Agreement on the Conservation of Albatrosses and Petrels (ACAP).

### Albatrosses

Seven species of albatross—the Antipodean, black-browed, Campbell, Indian yellow-nosed, Salvin's, wandering and white-capped—are listed as vulnerable, migratory and marine under the EPBC Act. None of the albatross species breed in the region, but all are known to forage within its boundaries. All seven species feed offshore, mainly along the edge of the continental shelf and over open waters, where they glide on thermal currents and catch fish and cephalopod (squid and cuttlefish) prey by diving into the water. The following species forage in the region:

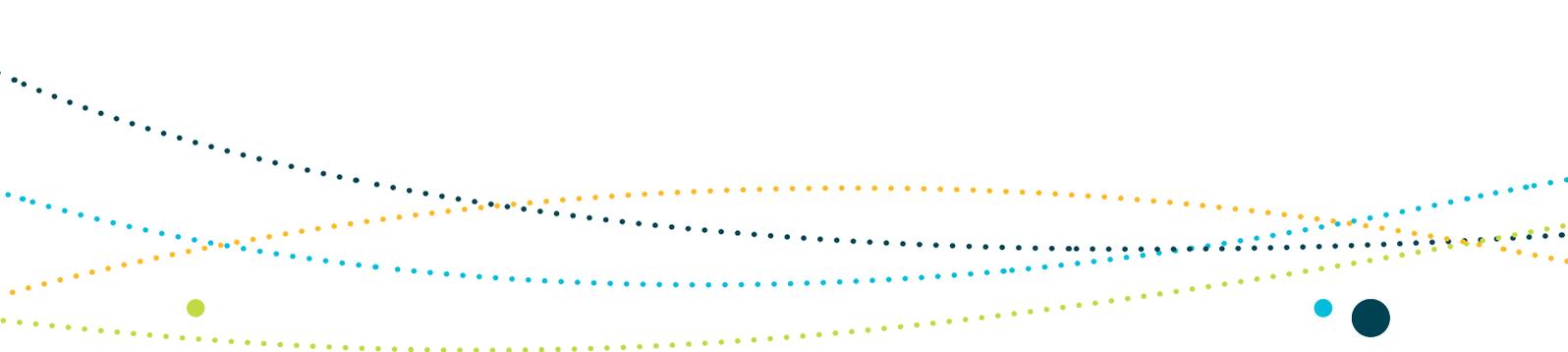
- The Antipodean albatross (*Diomedea antipodensis*) is known to lay eggs during the Southern Hemisphere summer and fledge from December to March (ACAP 2009a). The taxonomy of this species is controversial, with birds from the Auckland Islands population previously considered to be a separate species from the birds from the Antipodes Islands. Both breeding and non-breeding birds forage in the region, particularly from the Auckland Islands population (Walker & Elliott 2006).

- The black-browed albatross (*Thalassarche melanophris*) breeds on seven subantarctic islands, including Heard Island and McDonald Islands, and Macquarie Island (ACAP 2010a). Depending on location, the breeding season begins in September, with fledging in April to May (ACAP 2010a). This species feeds by surface seizing but can dive to 4.5 metres (Prince et al. 1994).
- The Campbell albatross (*Thalassarche impavida*) is endemic to Campbell Island and breeds annually from early August to May (ACAP 2009b). Juveniles appear to migrate north and disperse through the subtropics in winter, including along the eastern coast of Australia (ACAP 2009b).
- The Indian yellow-nosed albatross (*Thalassarche carteri*) breeds on the French subantarctic islands and on South Africa's Prince Edward Islands (ACAP 2009c). Eggs are laid in September to October, with fledging in March to April (ACAP 2009c).
- The Salvin's albatross (*Thalassarche salvini*) ranges across the Southern Ocean and may be considered a sub species of the shy albatross. The species mainly feeds on fish and cephalopods. Its breeding biology is not as well understood as other albatross species (ACAP 2009d).
- The wandering albatross (*Diomedea exulans*) also breeds on French and South African subantarctic islands, as well as British islands and a small population on Australia's Macquarie Island (ACAP 2009e). The breeding season lasts for just over one year, with adults returning to colonies in November, egg laying in December to January and fledging the following December (ACAP 2009e).
- The white-capped albatross (*Thalassarche steadi*) breeds on the subantarctic islands of New Zealand. There is limited data on the breeding biology of this species. Eggs are usually laid in mid-November (ACAP 2011).

## Petrels

In total, 12 species of petrel are known to occur within the region. Of these, seven species are known to breed either within the region or in waters adjacent to the region. In New South Wales, breeding populations of the following species visit the region to forage:

- Gould's petrel (*Pterodroma leucoptera*), listed as endangered and migratory under the EPBC Act, breeds at four island locations in New South Wales (Cabbage Tree, Boodelbah, Broughton and Little Broughton islands) (Garnett et al. 2011). The Australian birds are considered to be an endemic subspecies, *P. l. leucoptera* (Garnett et al. 2011). When not breeding, the species disperses throughout the Tasman Sea and eastern Pacific Ocean, feeding primarily on cephalopods (BirdLife International 2011; Brooke 2004; Marchant & Higgins 1990).

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- The white-faced storm-petrel (*Pelagodroma marina*) breeds at Tollgate Island in Batemans Bay (Brooke 2004). This site is thought to support around 7000–8000 pairs, with egg laying beginning in early summer. This species is known to feed on pelagic crustaceans, small fish and other surface plankton (Marchant & Higgins 1990).

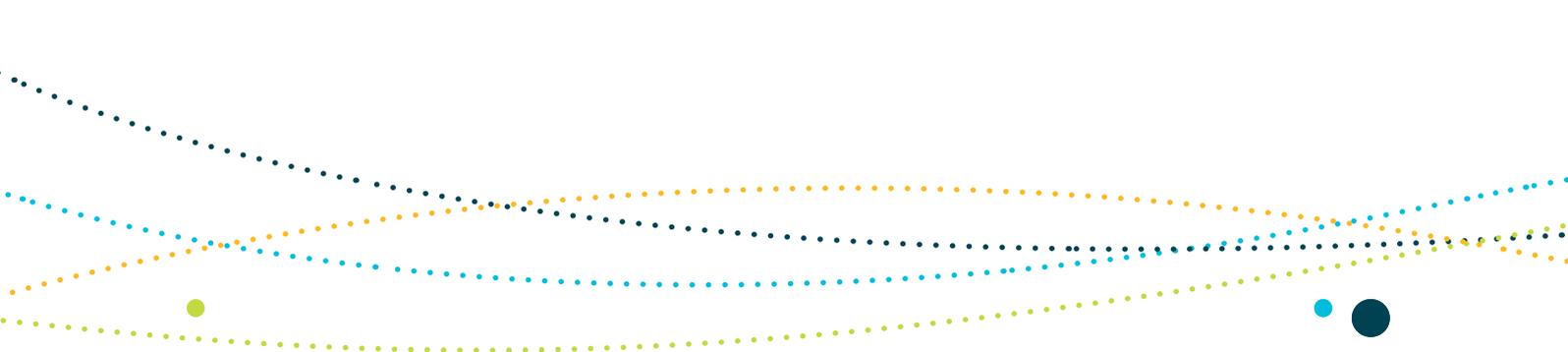
Further offshore, the islands of the Lord Howe and Norfolk groups support the remaining breeding populations of petrels. They are:

- the providence petrel (*Pterodroma solandri*), listed as migratory under the EPBC Act. Around 20 individuals breed on Phillip Island (Brooke 2004), and nearly 100 000 on Lord Howe Island (Garnett & Crowley 2000; Marchant & Higgins 1990). Egg laying occurs in May, with fledging from early November (Brooke 2004). This species prefers warm waters for foraging and its diet includes fish, cephalopods and crustaceans, as well as offal (Marchant & Higgins 1990). Birds are known to forage near fishing boats (Marchant & Higgins 1990)
- the Kermadec petrel (*Pterodroma neglecta*), listed as vulnerable under the EPBC Act, which breeds in small numbers on Ball's Pyramid and Phillip Island. The Australian birds are considered to be a subspecies, *P. n. neglecta*. This species is marine and highly pelagic; it rarely approaches land except at breeding colonies (Garnett et al. 2011). Little is known about the diet of this species, but it is known to eat squid and crustaceans (Marchant & Higgins 1990)
- the white-bellied storm-petrel (*Fregatta grallaria*), listed as vulnerable under the EPBC Act, which breeds on Roach Island (approximately 1000 pairs), Ball's Pyramid, Muttonbird Island and possibly Blackburn Island in the Lord Howe Island group (Garnett et al. 2011). The Australian birds are considered to be a subspecies, *F. g. grallaria* (Garnett et al. 2011). The species is highly pelagic and rarely approaches land except near breeding colonies (Garnett et al. 2011; Marchant & Higgins 1990). Its diet includes squid and crustaceans (Garnett et al. 2011)
- the white-necked petrel (*Pterodroma cervicalis*), which has been recorded breeding in very small numbers on Phillip Island, off Norfolk Island. The Australian birds are considered to be a subspecies, *P. c. cervicalis*. This species feeds on squid and crustaceans taken from the open ocean (BirdLife International 2011)
- the black-winged petrel (*Pterodroma nigripennis*), which breeds on Norfolk, Nepean and Phillip islands (several hundred birds), Lord Howe Island (up to 1000 pairs) and Ball's Pyramid (Garnett & Crowley 2000). This species mainly eats cephalopods and crustaceans taken from the open ocean (Marchant & Higgins 1990). The breeding population and range of this species are thought to be expanding (Brooke 2004).



In addition, five species are known to breed well beyond the region, but visit the region to forage. These are:

- the great-winged petrel (*Pterodroma macroptera*), which is highly pelagic and widespread in subtropical and subantarctic seas (Brooke 2004). Birds from New Zealand visit the western Tasman Sea off New South Wales during the non-breeding season (October to April) (Milburn et al. 2000). The diet of this species is dominated by cephalopods but also includes fish and crustaceans (Brooke 2004)
- the black petrel (*Procellaria parkinsoni*) listed as migratory under the EPBC Act. This species is endemic to New Zealand and is known to regularly visit east Australian waters during the non-breeding season (Garnett et al. 2011). Particularly common at the continental shelf and over seamounts, its diet is dominated by squid, but also includes fish and crustaceans (ACAP 2009f; BirdLife International 2011; Imber 1976). The species is also known to frequently scavenge around fishing vessels (ACAP 2009f)
- Wilson's storm-petrel (*Oceanites oceanicus*), listed as migratory under the EPBC Act, which breeds in the Australian territory on Heard Island and on Bishop Island off Macquarie Island (Garnett & Crowley 2000). The global population for the species is estimated at 12–30 million birds, although the Australian breeding population is considered to be a subspecies, *O. o. oceanicus* (BirdLife International 2011). Birds migrate north after breeding, reaching well north of the equator (Marchant & Higgins 1990). Their diet consists of small crustaceans, particularly euphausiids, fish and cephalopods (Marchant & Higgins 1990).
- the northern giant-petrel (*Macronectes halli*), which is listed as vulnerable and migratory under the EPBC Act, and breeds annually on a range of subantarctic islands. This species is pelagic and circumpolar. During summer, it ranges through the open oceans of the Antarctic and subantarctic, while in winter and early spring, it can be found throughout subtropical seas to 28° S (ACAP 2010b)
- the southern giant-petrel (*Macronectes giganteus*), which is listed as endangered and migratory under the EPBC Act, and breeds on a range of oceanic islands and island groups between 40° S and 60° S (ACAP 2010c). During winter months, this species occurs off the New South Wales coast near Wollongong, but is less frequently recorded than the northern giant-petrel.



## Shearwaters

Five shearwater species are known to breed either within the region or in areas adjacent to the region. These species are all listed as migratory under the EPBC Act:

- The flesh-footed shearwater (*Ardenna carneipes*) breeds on Lord Howe Island, as well as a range of other locations beyond the region (Garnett et al. 2011; Marchant & Higgins 1990; Priddel et al. 2006). This species mainly forages offshore over continental shelves, where it feeds on fish and squid (Marchant & Higgins 1990).
- The short-tailed shearwater (*Ardenna tenuirostris*) breeds in more than 160 colonies around south-east Australia. The majority of these locations are around Victoria and Tasmania, but small colonies also nest off New South Wales, Western Australia and South Australia (Brooke 2004). This species migrates to the Northern Hemisphere during the austral winter (Marchant & Higgins 1990). It is often gregarious when feeding and can dive up to 70 metres (Weimerskirch & Chérel 1998). Its diet is dominated by crustacea, mainly euphausiids, as well as fish and cephalopods (Brooke 2004).
- The sooty shearwater (*Ardenna grisea*) primarily breeds in New Zealand, but also on islands off eastern Australia, Chile and the Falklands (Brooke 2004). This species migrates to the northern Pacific Ocean during the non-breeding (austral winter) season (BirdLife International 2011; Brooke 2004). The species has recently been assessed to be near threatened due to a significant decline in a large New Zealand subantarctic population (Garnett et al. 2011). Its diet includes fish, crustaceans and cephalopods (Marchant & Higgins 1990).
- The wedge-tailed shearwater (*Ardenna pacifica*) breeds on the islands of the Lord Howe and Norfolk Island groups, as well as islands off Queensland and New South Wales, and in the Coral Sea (Marchant & Higgins 1990). The diet of this species includes flying fish, other fish species, cephalopods and crustaceans (Brooke 2004). This species is known to be reliant on tuna or cetaceans to drive prey to the surface (Brooke 2004).
- The little shearwater (*Puffinus assimilis*) breeds on the Lord Howe Island and Norfolk Island groups (Garnett & Crowley 2000). The Australian breeding population is considered to be an endemic subspecies, *P. a. assimilis*, and has recently been assessed as vulnerable (Garnett et al. 2011). After breeding, this species apparently disperses over the Tasman Sea and possibly the Coral Sea (Garnett et al. 2011). It forages relatively close to breeding islands and its diet consists of squid, fish and crustaceans (BirdLife International 2011; Garnett et al. 2011).



## Penguins

The little penguin (*Eudyptula minor*) breeds around New Zealand and southern Australia. Within the region, this species breeds on several islands in New South Wales waters. The most significant sites include Montague Island (5000 pairs), Tollgate Island (5000 pairs), Brush Island (2500 pairs) and Five Islands (1500 pairs) (NSW OE&H 2011). This species usually forages in shallow waters close to the coast during the breeding season, although it can stay at sea for months, hundreds of kilometres from colonies (DECC 2009). The little penguin can dive to a depth of 60 metres (DECC 2009) and its diet includes squid, krill and small schooling fish (Marchant & Higgins 1990).

## Terns and noddies

Seven species of the tern family are known to occur within the region (including the black noddy and common noddy, which are members of tern family). Six of these are known to breed either in the region or in areas adjacent to it. These species are:

- the crested tern (*Thalasseus bergii*), an inhabitant of tropical and subtropical waters, from coastlines to offshore pelagic waters. The species is widespread from the south coast of Africa, across Asia and east to Polynesia (Higgins & Davies 1996). It breeds on islands in large colonies off the Queensland and New South Wales coasts, preferentially selecting offshore islands, low-lying coral reefs, sandy or rocky coastal islets, coastal spits and lagoon mudflats (Higgins & Davies 1996; IUCN 2010). Its diet consists predominantly of pelagic fish, as well as cephalopods, crustaceans, insects; it also feeds opportunistically on hatchling turtles (IUCN 2010)
- the white tern (*Gygis alba*), a pelagic (open ocean) species with a transglobal distribution throughout tropical and subtropical oceans. It is known to breed between September and June on Norfolk Island (2000 pairs) and Lord Howe Island (100 pairs) (NSW NPWS 1999a). It is thought to disperse into oceanic areas relatively close to breeding islands (Higgins & Davies 1996). It feeds both inshore and offshore and its diet includes fish and other small aquatic animals (NSW NPWS 1999a)
- the sooty tern (*Onychoprion fuscata*), a pelagic species that occurs within the tropical and subtropical waters of the Indian, Pacific and Atlantic oceans (Higgins & Davies 1996). This species nests in large colonies, usually in a simple scrape or depression on the ground (NSW NPWS 1999b). It breeds on the Lord Howe Island (up to 1 million pairs) and Norfolk Island (up to 70 000 pairs) groups, and is also present on islands within the Coral Sea and Great Barrier Reef (Higgins & Davies 1996). Its diet consists predominantly of squid, crustaceans and fish. It has been observed feeding in association with tuna that chase prey close to the surface of the ocean (Higgins & Davies 1996; NSW NPWS 1999b)

- the grey ternlet (*Procelsterna cerulea*) is widely distributed across the southern Pacific. It breeds on the Lord Howe and Norfolk Island groups (Garnett & Crowley 2000), laying a single egg on bare rock or a depression in the sand (Higgins & Davies 1996). It is recorded in the waters around breeding islands throughout the year (Higgins & Davies 1996). This species feeds on crustaceans, fish and squid, mainly taken from inshore waters (Higgins & Davies 1996)
- the common noddy (*Anous stolidus*), listed as migratory under the EPBC Act. It has a large global range and, within the region, is known to breed on the Lord Howe and Norfolk Island groups, as well as beyond the region on islands in the Great Barrier Reef and Coral Sea (Higgins & Davies 1996). The breeding season is highly variable and depends on the location (Higgins & Davies 1996). The species is found in the waters surrounding breeding colonies during the breeding season, but is more pelagic during the non-breeding season (Higgins & Davies 1996). Its diet is predominantly fish with some squid, pelagic molluscs, medusa and insects (Higgins & Davies 1996)
- the black noddy (*Anous minutus*), which has a widespread global distribution in tropical and subtropical seas. It breeds on the Lord Howe (36 pairs) and Norfolk Island (1000–10 000 pairs) groups, as well as beyond the region in the Great Barrier Reef and southwest Coral Sea (Higgins & Davies 1996). Most populations remain on the breeding islands through the year (Higgins & Davies 1996). The species' diet includes fish, squid and, rarely, crustaceans (Higgins & Davies 1996).

The roseate tern (*Sterna dougallii*) is also known to forage within the region. This species has a widespread but sparsely distributed global population. It breeds on islands along the Queensland coast (Higgins & Davies 1996) and is thought to come into the region to rest (in sheltered estuaries, creeks, inshore areas and waters up to several kilometres offshore) and forage (IUCN 2010). Its diet consists predominantly of small pelagic fish, although it also eats insects and crustaceans (IUCN 2010).

## Boobies

The masked booby (*Sula dactylatra*) is listed as migratory under the EPBC Act, and breeds on the Lord Howe and Norfolk Island groups, as well as beyond the region in the Coral Sea (Marchant & Higgins 1990). This species is considered to be pelagic and forages offshore for fish or squid (Marchant & Higgins 1990; Nelson 2005).

## Tropicbirds

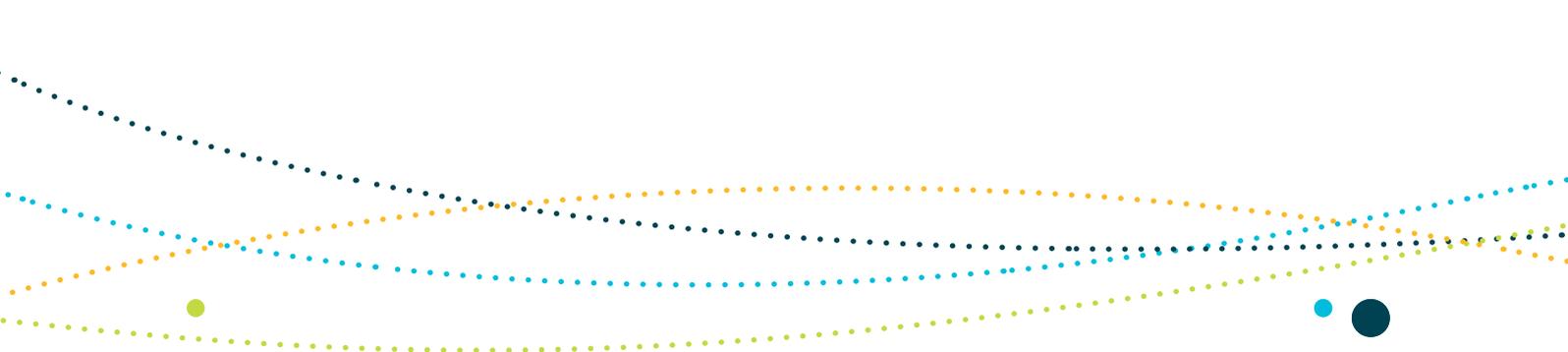
The red-tailed tropicbird (*Phaethon rubricauda*) breeds on the Lord Howe and Norfolk Island groups (Marchant & Higgins 1990). The most pelagic of the tropicbirds, its diet consists of fish and cephalopods (Marchant & Higgins 1990; Nelson 2005).



## Biologically important areas

Biologically important areas are areas that are particularly important for the conservation of the protected species and where aggregations of individuals of a species display biologically important behaviour such as breeding, foraging, resting or migration. The presence of an observed behaviour is also assumed to be indicative of the presence of required habitat(s). Biologically important areas have been identified for some EPBC Act listed species found in the Temperate East Marine Region, using expert scientific knowledge about species' distribution, abundance and behaviour in the region. The selection of species was informed by the availability of scientific information, their conservation status of listed species and the importance of the region for the species. The range of species for which biologically important areas are identified will continue to expand as reliable spatial and scientific information becomes available.

Biologically important areas have been identified for the Antipodean albatross, black-browed albatross, Campbell albatross, Indian yellow-nosed albatross, wandering albatross, white-capped albatross, Gould's petrel, northern giant-petrel, southern-giant petrel, Kermadec petrel, black petrel, black-winged petrel, great-winged petrel, providence petrel, white-faced storm-petrel, white-necked petrel, Wilson's storm-petrel, white-bellied storm-petrel, flesh-footed shearwater, little shearwater, short-tailed shearwater, sooty shearwater, wedge-tailed shearwater, grey ternlet, sooty tern, white tern, black noddy, common noddy, masked booby, red-tailed tropicbird and little penguin. Behaviours used to identify biologically important areas for seabirds include breeding areas (encompasses breeding sites and areas where the species is likely to forage to provision young), foraging and migration. Biologically important areas are included in the Temperate East Marine Region Conservation Values Atlas ([www.environment.gov.au/cva](http://www.environment.gov.au/cva)).



## 2. Vulnerabilities and pressures

### Vulnerabilities

The life history patterns of seabirds—including long life spans, delayed reproduction and small numbers of young each year—make them vulnerable to a range of pressures in the marine environment. It is common for both adult seabirds to participate in chick-rearing and for pairs to be monogamous, at least seasonally. Some species groups (such as albatrosses, petrels and dark terns) exhibit strong site fidelity when breeding successfully and use the same nest site over many years. Seabirds are also normally philopatric; that is, the pre-breeding-age birds return, at least initially, to their natal colony. Disturbances such as on-island predation or prolonged food failure may reduce the likelihood of this behaviour in favour of dispersal to other sites (Dunlop 2009). Many species travel long distances and cover large areas in search of food. Pressures acting on foraging seabirds in the region have the potential to impact on populations breeding adjacent to (e.g. on islands or along the coast) or well outside the region (e.g. species such as albatross that nest on subantarctic islands).

The factors that make some seabirds more or less vulnerable to pressures include their anti-predator breeding adaptations and foraging behaviour. Foraging behaviour underpins interactions with fishing operations, reliance on multi-species foraging assemblages (e.g. tuna or cetaceans) for prey availability and dependence on relatively productive, but spatially limited, oceanographic features within range of breeding colonies.

### Analysis of pressures

On the basis of current information, pressures have been analysed for the 34 seabird species discussed in this report card. A summary of the pressure analysis for seabirds is provided in Table 1. Only those pressures identified as *of concern* or *of potential concern* are discussed in further detail on following page. An explanation of the pressure analysis process, including the definition of substantial impact used in this analysis, is provided in Part 3 and Section 1.1 of Schedule 1 of the plan.

**Table 1: Outputs of the seabird species pressure analysis for the Temperate East Marine Region**

Pressure	Source	Species											
		Masked booby	Common noddy	Black noddy	Sooty tern	Roseate tern	White tern	Crested tern	Grey ternlet	Red-tailed tropic-bird	Sooty shear-water	Short-tailed shear-water	Wedge-tailed shear-water
Sea level rise	Climate change	Yellow	Yellow	Yellow	Green	Grey	Green	Yellow	Green	Yellow	Green	Green	Green
Changes in sea temperature	Climate change	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Change in oceanography	Climate change	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Ocean acidification	Climate change	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Chemical pollution/contaminants	Shipping Vessels (other)	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
	Urban development Agricultural activities	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Nutrient pollution	Urban development	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Marine debris	Shipping Vessels (other)	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
	Fishing boats Land-based activities	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Noise pollution	Seismic exploration	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
	Shipping Vessels (other)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	Urban development	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Light pollution	Land-based activities	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Yellow	Yellow	Yellow
	Shipping Vessels (other)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Physical habitat modification	Dredging Dredge spoil	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
	Fishing gear	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Human presence at sensitive sites	Tourism Recreational and charter fishing Research	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Extraction of living resources	Commercial fishing (domestic) prey depletion	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
	Recreational and charter fishing	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
	Indigenous harvest	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Bycatch	Commercial fishing (domestic)	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Yellow	Yellow	Yellow
	Recreational and charter fishing	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Green	Green	Green
Oil pollution	Shipping Vessels (other)	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
	Oil rigs	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Collision with vessels	Shipping Tourism Fishing	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey	Grey
Invasive species	Shipping Fishing vessels Land-based activities	Red	Red	Red	Red	Red	Yellow	Red	Red	Red	Red	Red	Red

**Legend**      ■ of concern      ■ of potential concern      ■ of less concern      ■ not of concern

Table 1 continued: Outputs of the seabird species pressure analysis for the Temperate East Marine Region

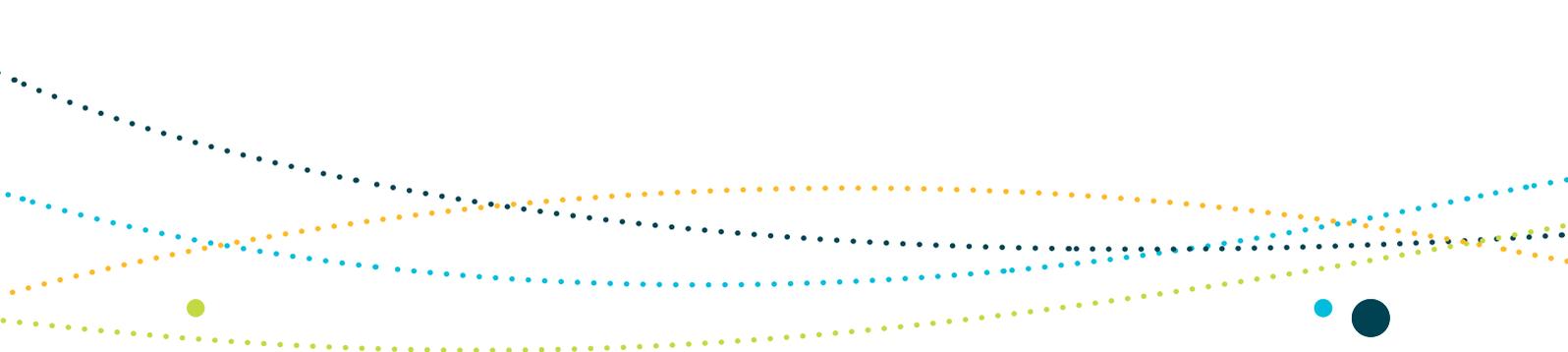
Pressure	Source	Species										
		Flesh-footed shear-water	Little shear-water	Little penguin	Providence petrel	White-bellied storm-petrel	White-faced storm-petrel	Wilson's storm-petrel	Black-winged petrel	Gould's petrel	Kermadec petrel	White-necked petrel
Sea level rise	Climate change											
Changes in sea temperature	Climate change											
Change in oceanography	Climate change											
Ocean acidification	Climate change											
Chemical pollution/contaminants	Shipping Vessels (other)											
	Urban development Agricultural activities											
Nutrient pollution	Urban development											
Marine debris	Shipping Vessels (other) Fishing boats Land-based activities											
	Seismic exploration											
Noise pollution	Shipping Vessels (other)											
	Urban development											
Light pollution	Land-based activities											
	Shipping Vessels (other)											
Physical habitat modification	Dredging Dredge spoil											
	Fishing gear											
Human presence at sensitive sites	Tourism Recreational and charter fishing Research											
Extraction of living resources	Commercial fishing (domestic) prey depletion											
	Recreational and charter fishing											
	Indigenous harvest											
Bycatch	Commercial fishing (domestic)											
	Recreational and charter fishing											
Oil pollution	Shipping Vessels (other)											
	Oil rigs											
Collision with vessels	Shipping Tourism Fishing											
Invasive species	Shipping Fishing vessels Land-based activities											

Legend ■ of concern ■ of potential concern ■ of less concern ■ not of concern

Table 1 continued: Outputs of the seabird species pressure analysis for the Temperate East Marine Region

Pressure	Source	Species										
		Wandering albatross	Black-browed albatross	Salvin's albatross	White-capped albatross	Antipodean albatross	Campbell albatross	Indian yellow-nosed albatross	Southern giant-petrel	Northern giant-petrel	Black petrel	Great-winged petrel
Sea level rise	Climate change											
Changes in sea temperature	Climate change											
Change in oceanography	Climate change											
Ocean acidification	Climate change											
Chemical pollution/contaminants	Shipping Vessels (other)											
	Urban development Agricultural activities											
Nutrient pollution	Urban development											
Marine debris	Shipping Vessels (other) Fishing boats Land-based activities											
	Seismic exploration											
Noise pollution	Shipping Vessels (other)											
	Urban development											
Light pollution	Land-based activities											
	Shipping Vessels (other)											
Physical habitat modification	Dredging Dredge spoil											
	Fishing gear											
Human presence at sensitive sites	Tourism Recreational and charter fishing Research											
Extraction of living resources	Commercial fishing (domestic) prey depletion											
	Recreational and charter fishing											
	Indigenous harvest											
Bycatch	Commercial fishing (domestic)											
	Recreational and charter fishing											
Oil pollution	Shipping Vessels (other)											
	Oil rigs											
Collision with vessels	Shipping Tourism Fishing											
Invasive species	Shipping Fishing vessels Land-based activities											

Legend ■ of concern ■ of potential concern ■ of less concern ■ not of concern



### **Sea level rise—climate change**

Sea level rise associated with climate change has been assessed as *of potential concern* for the masked booby, common noddy, black noddy, crested tern and red-tailed tropicbird. Global sea levels have risen by 20 centimetres between 1870 and 2004, and predictions estimate a further rise of 5–15 centimetres by 2030, relative to 1990 levels (Church et al. 2009). Longer term predictions estimate increases of 0.5 to 1 metre by 2100, relative to 2000 levels (Climate Commission 2011). Seabird species nesting on the lowland parts of the Lord Howe Island group are at risk from sea level rise (Congdon et al. 2007). The impacts of rising sea level on seabirds include loss of habitat through inundation of breeding sites, greater effects of storms (compounded by the predicted increase in frequency and intensity of storms), and altered erosion and deposition patterns (Chambers et al. 2009). Impacts are expected to vary with breeding habitat and location, and high rocky islands are at lower risk than low-lying, less stable islands. However, there are no known quantitative links between observed sea level rise and changes in the distribution and abundance of nesting Australian seabirds (Chambers et al. 2009).

### **Changes in sea temperature—climate change**

Changes in sea temperatures associated with climate change have been assessed as *of potential concern* to all seabirds in the region. Sea temperatures have warmed by 0.7 °C between 1910–1929 and 1989–2008, and current projections estimate ocean temperatures will be 1 °C warmer by 2030 (Lough 2009). This pressure is likely to have implications for the region's productivity, with effects on a broad range of species (Feng et al. 2009). For example, it may result in changes to zooplankton communities, with implications for prey-dependent species, such as seabirds (Richardson et al. 2009). This may drive subsequent expansions or shifts in seabird distributions (most likely southward) and alter reproductive timing and success (Chambers et al. 2009). Beyond the region (e.g. in the Great Barrier Reef), higher sea temperatures have been linked to reduced breeding success for the sooty tern, black noddy and wedge-tailed shearwater, driven by reductions in provisioning rates (Congdon et al. 2007; Peck et al. 2004; Smithers et al. 2003). More broadly, data from across the central and eastern Pacific, Indian and Southern oceans indicate that warmer surface waters are linked to reduced breeding success, later breeding and increased mortality in a number of seabird species (Chambers et al. 2009).

For species that are already at the extremity of their breeding range and travel long distances to obtain food (such as those breeding on the Lord Howe Island group), any southward shift in prey distribution is likely to significantly impact breeding success.



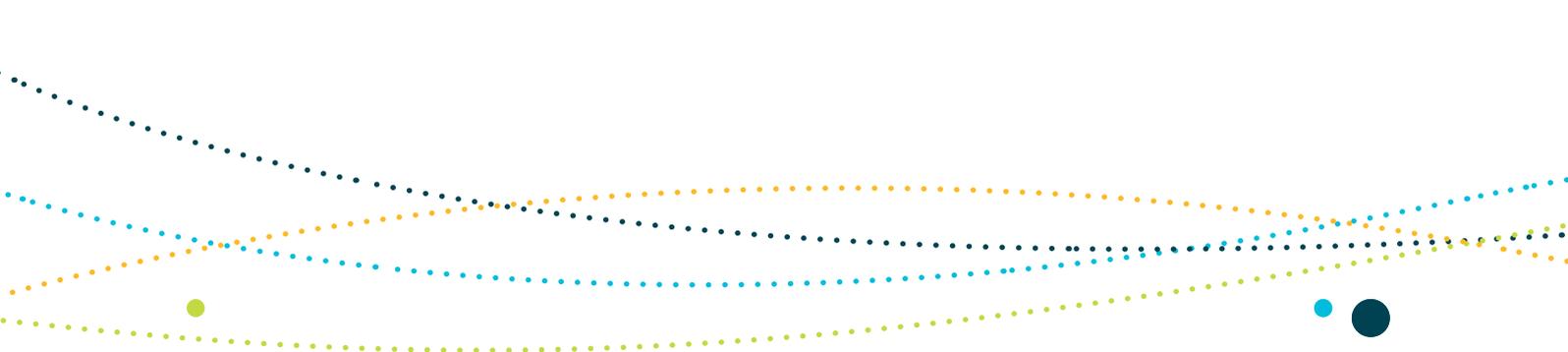
### **Changes in oceanography—climate change**

Changes in oceanography associated with climate change have been assessed as *of concern* to the sooty tern, and *of potential concern* to all the other seabird species in the region. Changes in oceanography broadly refer to changes in circulation patterns; current intensities; wind strength and direction; the location and strength of eddy and upwelling events; and climatic oscillations such as the El Niño–Southern Oscillation. Oceanographic changes (i.e. currents and eddy fields) in the region will be primarily driven by the East Australian Current. Studies indicate that this major boundary current has been strengthening, pushing warmer, saltier water up to 350 kilometres further down the east coast (Ridgway & Hill 2009). Associated circulation effects will also arise from expected changes to the El Niño–Southern Oscillation.

Changes in oceanography may influence the supply and distribution of nutrients and light and, therefore, prey species. At sea, seabirds commonly seek out regions of enhanced productivity (e.g. eddies or fronts) for foraging opportunities (BirdLife International 2010; Hyrenbach et al. 2000). Temporal or spatial shifts in productivity are likely to have implications for seabird distribution, migration, foraging and breeding (Chambers et al. 2009). Within the region, breeding success is thought to be linked to the continued stability of a small number of highly productive nutrient hotspots along the eastern edge of the continental shelf (Chambers et al. 2009; Congdon et al. 2007). El Niño events have also been linked to breeding failures in seabirds due to changes in ocean stratification and associated impacts on prey species. For example, the 2002 El Niño–Southern Oscillation event led to sooty terns at Lord Howe Island experiencing almost complete breeding failure; almost all chicks that hatched died of starvation (Congdon et al. 2007). Finally, the southward extension of the East Australian Current is likely to bring subtropical species into temperate waters, increasing competition for foraging habitats and nesting sites (Chambers et al. 2009).

### **Ocean acidification—climate change**

Ocean acidification associated with climate change has been assessed as *of potential concern* to all seabirds in the region. Driven by increasing levels of atmospheric CO<sub>2</sub> and subsequent chemical changes in the ocean, ocean acidification is already under way and detectable. Since pre-industrial times, acidification has lowered ocean pH by 0.1 units (Howard et al. 2009). Furthermore, climate models predict this trend will continue, with a further 0.2–0.3 unit decline by 2100 (Howard et al. 2009). Ocean acidification poses a serious problem for key marine organisms with calcium carbonate skeletons, such as corals and some plankton. However, there is a high level of uncertainty about the effects of ocean acidification on marine life, including seabirds. Seabirds may be affected by large-scale changes in the relative abundance of parts of the food chain. For example, recent research indicates potentially significant impacts of ocean acidification on Antarctic krill (Kawaguchi et al. 2011), which are a food source for



many seabird species that visit Australian waters. Because seabirds are sensitive to changes at lower trophic levels, they may be one of the first species groups to register the changes brought about by ocean acidification (Hobday et al. 2006). It has been suggested that squid, which are key prey for many seabird species that dive for food, may be especially vulnerable to ocean acidification—their high metabolism and high-energy swimming requires a good supply of oxygen, but higher CO<sub>2</sub> concentrations reduce the oxygen-carrying capacity of their blood (Frisch 2006).

### ***Chemical pollution/contaminants—shipping, vessels (other)***

Chemical pollution/contaminants have been assessed as *of potential concern* to all seabirds. As with oil spills, chemical spills are also unpredictable events and their likelihood is low. However, shipping is a key activity in the region, and shipping routes and ports are adjacent to seabird breeding and foraging habitats. Seabirds are considered indicators for chemicals in the marine environment and, as top order predators in marine trophic systems, they are vulnerable to persistent chemical pollutants such as organochlorines. These chemicals have been demonstrated elsewhere to result in seabird mortality and breeding failure (Becker 1989). A number of management measures are in place to respond to the risk of chemical spills, including the *National plan to combat pollution of the sea by oil and other noxious and hazardous substances* and the International Convention for the Prevention of Pollution from Ships (MARPOL), both of which are implemented through the Australian Maritime Safety Authority.

### ***Marine debris—shipping, fishing boats, vessels (other), land-based activities***

Marine debris has been assessed as *of potential concern* to all seabirds. Marine debris is defined as any persistent, manufactured or processed solid material discarded, disposed of, or abandoned, in the marine and coastal environment (UNEP 2005). The injuries and fatalities to vertebrate marine life caused by ingestion of, or entanglement in, harmful marine debris was listed as a key threatening process under the EPBC Act in 2009 (DEWHA 2009b). Marine debris data for the region is limited; however, key factors for the introduction and spread of debris within the region are present (Katsanevakis 2008). These include high levels of commercial shipping, major current systems (i.e. the East Australian Current), active fisheries (recreational and commercial) and significant coastal urban development.

The impacts of marine debris on seabirds include death through drowning, injury through entanglement, or starvation after ingestion (Baker et al. 2002). Seabird species are particularly prone to ingesting polystyrene balls and plastic buoys (which they confuse with fish eggs) and to entanglement (which can kill individuals or slow them down, reducing their ability to catch prey and avoid predators) (Ceccarelli 2009). In a study of 205 known interactions between seabirds and plastic debris since 1974, involving 29 species of seabird, just over 17 per cent were freed and released alive, while around 70 per cent perished (Ceccarelli 2009).



### **Light pollution—land-based activities**

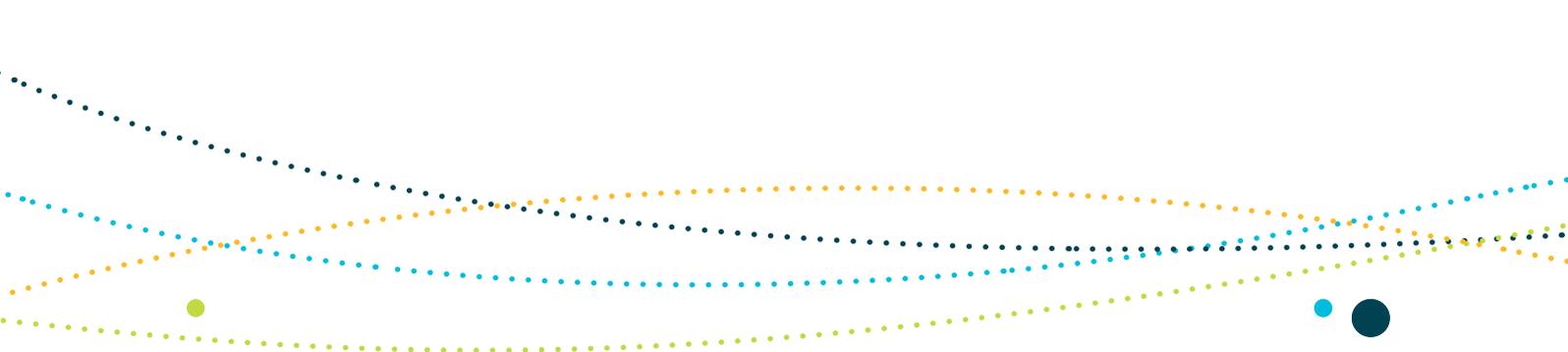
Light pollution has been assessed as *of potential concern* to shearwaters, petrels and the little penguin. Artificial lights are known to attract and disorientate seabirds, and petrels, shearwaters and penguins are considered to be vulnerable because they commonly return to their breeding colonies at night (Aubrecht et al. 2010). Juveniles are thought to be particularly vulnerable to disorientation from artificial lighting, as they are not familiar with visual cues such as light derived from the moon and stars (Aubrecht et al. 2010). Although research on the impact of light pollution on seabird populations is limited, preliminary studies in Hawaii, the Reunion Islands and the Canary Islands indicate light-induced mortality rates are of concern for petrels and small shearwaters (Aubrecht et al. 2010).

### **Human presence at sensitive sites—tourism, recreational and charter fishing, research**

Human presence at sensitive sites has been assessed as *of potential concern* to all seabirds that breed in the region. Disturbance during the breeding season may decrease the breeding success and fitness of adult birds, particularly when they are distracted from foraging, roosting or resting (WMB Oceanics & Claridge 1997). Breeding success can be influenced by the amount of time an adult bird can devote to chick-rearing. For example, if adult birds are disturbed from a nest, eggs and chicks become vulnerable to predation. The extent of the impact at a breeding site is influenced by visitor frequency, approach distances and the sensitivity of particular species to disturbance. In general, ground nesting species (e.g. terns and boobies) are vulnerable to disturbance; highly sensitive species include the roseate tern and crested tern (Langham & Hulsman 1986; Surman & Nicholson 2006; WMB Oceanics & Claridge 1997).

### **Bycatch—commercial fishing (domestic)**

Bycatch in Australian domestic commercial fisheries has been assessed as *of potential concern* for 16 species of seabird in the region: Antipodean albatross, black-browed albatross, black petrel, Campbell albatross, flesh-footed shearwater, great-winged petrel, Indian yellow-nosed albatross, northern giant-petrel, Salvin's albatross, short-tailed shearwater, sooty shearwater, southern giant-petrel, wandering albatross, wedge-tailed shearwater, white-capped albatross and white-necked petrel. Direct interactions with commercial fishing operations can lead to seabird deaths by drowning (e.g. on longline hooks) and collision (e.g. warp strike). At a population level, costs to fecundity may result from disruption of breeding pairs and skews in sex ratio. Deaths from interactions with fishing operations generally affect the larger species of seabird because they can swallow baited hooks and habitually follow ships (Baker et al. 2002).



The Temperate East Marine Region sustains a strong commercial fishing industry that uses a range of gear types that pose a risk for seabirds, including longlining as part of the Eastern Tuna and Billfish Fishery, Ocean Trap and Line Fishery and Southern and Eastern Scalefish and Shark Fishery (Morison & McLoughlin 2010). Mitigation measures in and outside the region do exist to mitigate this pressure, and have been shown to reduced albatross bycatch (Wilcox & Donlan 2007). Nonetheless, longlining operations remain a threat for albatross species, particularly in light of research indicating that historical methodologies for estimating bycatch for pelagic longline fishing vastly underestimates the problem (Brothers et al. 2010). Although interactions between longliners and albatross are most commonly discussed, other species are also susceptible to their impacts. For example, flesh-footed shearwaters suffered high bycatch mortality during the mid-2000s (Baker & Wise 2005) and although this has since decreased, the entire eastern Australian population showed evidence of decline due to this pressure (Priddel et al. 2006). A recent review of wildlife bycatch in Commonwealth fisheries has also highlighted the potential bycatch issues associated with trawl fisheries, recommending that seabird bycatch is assessed to determine the degree of impact these fisheries are having on protected seabird populations (Bensley et al. 2010; Phillips et al. 2010).

### ***Bycatch—recreational and charter fishing***

Bycatch from recreational and charter fishing operations has been assessed as *of potential concern* for the flesh-footed shearwater. Recreational and charter fishing activities are widespread along Australia's east coast and are expected to increase in the future as coastal communities continue to expand. Seabirds interact with recreational anglers and game fishers (McPhee et al. 2002) and the widespread nature of these fishing activities means that the likelihood of seabird–fisher interaction is high. Interactions with recreational fishing gear can lead to injury and sometimes death through ingestion of baited hooks and fishing line, and entanglement in crabpots and fishing line (McPhee et al. 2002). Trolling is also known to affect flesh-footed shearwaters.

### ***Oil pollution—shipping, vessels (other)***

Oil pollution has been assessed as *of potential concern* to all seabirds. Australia has a strong system for regulating industry activity that is the potential source of oil spills and this system has been strengthened further in response to the Montara oil spill. While oil spills are unpredictable events and their likelihood is low based on past experience their consequences, especially for threatened species at important areas, could be severe. Shipping is a key activity in the region, with shipping routes and ports located adjacent to seabird breeding and foraging habitat.



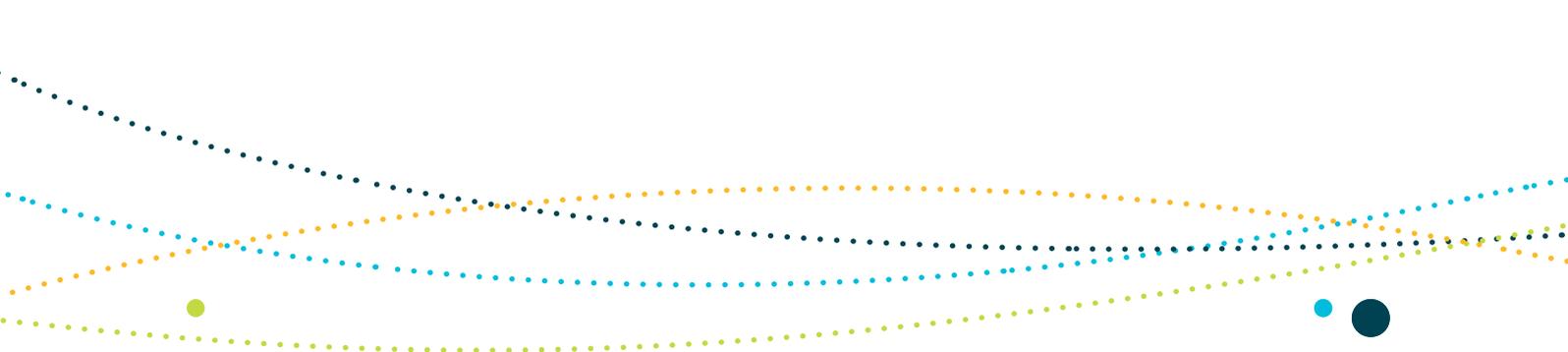
Seabirds are vulnerable to oil pollution because oil sticks to feathers, affecting their insulation and waterproofing properties and rendering some birds flightless and vulnerable to predation. The indirect effects of oil spills on seabirds include impacts on prey through damage to fish eggs, larvae and young fish (AMSA 2010). Chemicals used to disperse oil can themselves be toxic to marine life (AMSA 2010). Petroleum-based products have been shown to kill seabird embryos. Adjacent to the region, a study on the effects of oil spills on birds at Moreton and Bribie islands found that sites affected by the spill contained 50 per cent fewer species than unaffected sites. Seabirds such as terns and gulls were considered among those birds most at risk (Birds Australia 2010).

### ***Invasive species—shipping, fishing vessels, land-based activities***

An invasive species is one that occurs and thrives outside its normal geographical distribution as a result of human activities, and can include animals, weeds, diseases and parasites (Olsen et al. 2006). Invasive species have been assessed as *of concern* for seabirds breeding in the region and *of potential concern* for seabirds foraging in the region. The impacts of invasive species, which include reduced reproductive success, direct mortality and ecosystem degradation, are considered to be the greatest threat for seabirds after habitat loss, contributing to the threatened status of many species in the region (Olsen et al. 2006).

A number of human-related vectors are implicated in the spread of invasive species, including shipping (hull fouling, contaminated ballast water), tourism and fishing vessels. Invasive species can also be introduced by wind or other animals. European settlers and (indirectly) the vessels they arrived on are implicated in the introduction of Australia's most established invasive species, which pose a threat to seabirds. These include the black rat (introduced to Lord Howe Island in 1918), the European rabbit (introduced to Phillip Island near Norfolk Island during the establishment of the penal colony) and the red fox (introduced to Australia by European settlers for hunting).

Around the region, there are many instances where invasive species have had a catastrophic effect on seabird populations. In the Lord Howe Island group, black rats are thought to have eliminated Kermadec petrels, little shearwaters and white-bellied storm-petrels from the main island, although these species still persist on Ball's Pyramid, Roach Island and associated islets (Garnett et al. 2011). Black rats are known to prey on seabird eggs (DEH 2005). Rabbits severely degraded the nesting habitat of the Gould's petrel on Cabbage Tree Island, removing the understorey and increasing the risk from avian predators, as well as preventing regeneration of the rainforest canopy and allowing invasion by exotic plant species (NSW NPWS 2000). Rabbits have since been eradicated from Cabbage Tree Island. On Norfolk Island, a recent incursion of Argentine ants (considered one of the world's worst invasive species) threaten several rare seabird populations through egg predation (Davis 2008; DNP 2010). One of the greatest threats to penguins on Montague Island has been the increasing distribution of exotic kikuyu grass, which forms thick, impenetrable mats and can entangle adults and chicks (DECC 2009).



### 3. Relevant protection measures

All seabirds are protected as listed marine species under section 248 of the EPBC Act. Under the Act, it is generally an offence to kill, injure, take, trade, keep or move listed marine, migratory or threatened species on Australian Government land or in Commonwealth waters without a permit. All seabirds are also considered protected fauna under state legislation operating in state waters.

Alongside the EPBC Act, a broad range of sector-specific management measures to address environmental issues and mitigate impacts apply to activities that take place in Commonwealth marine areas. These measures give effect to regulatory and administrative requirements under Commonwealth and state legislation, for activities such as commercial and recreational fishing; oil and gas exploration and production; ports activities; and maritime transport. In some instances, as in the case of shipping, these measures also fulfil Australia's obligations under a number of international conventions for the protection of the marine environment from pollution and environmental harm.

#### EPBC Act conservation plans and action plans

- *National recovery plan for threatened albatrosses and giant petrels 2011–2016* (DSEWPaC 2011)
- *National recovery plan for ten species of seabirds* (DEH 2005)
- *Threat abatement plan for the incidental catch (or bycatch) of seabirds during oceanic longline fishing operations* (DEWR 2006)
- *Threat abatement plan for the impacts of marine debris on vertebrate marine life* (DEWHA 2009b)
- *Gould's petrel (Pterodroma leucoptera leucoptera) recovery plan* (DEC 2006)
- *The action plan for Australian birds* (Garnett et al. 2011).



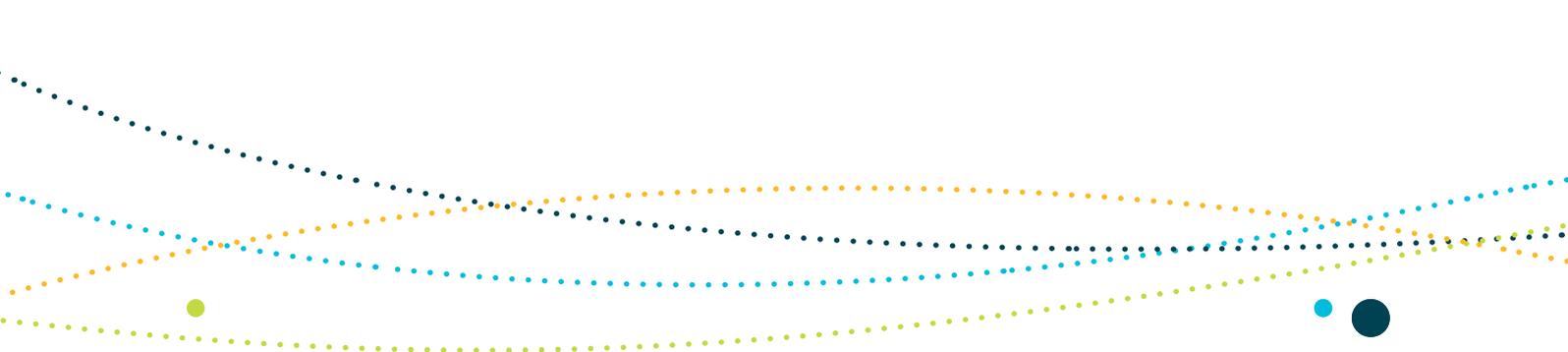
## International measures

Australia is also a signatory to the following international agreements for the conservation of seabirds:

- Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)—[www.cites.org](http://www.cites.org)
- The Bonn Convention: Conservation of Migratory Species (CMS )—[www.cms.int](http://www.cms.int)
- Agreement on the Conservation of Albatrosses and Petrels (ACAP). ACAP has been developed under the auspices of the Convention on the Conservation of Migratory Species of Wild Animals (CMS) 1979
- The Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment 1974 (JAMBA) —[www.austlii.edu.au/au/other/dfat/treaties/1981/6.html](http://www.austlii.edu.au/au/other/dfat/treaties/1981/6.html)
- the Agreement between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment 1986 (CAMBA)—[www.austlii.edu.au/au/other/dfat/treaties/1988/22.html](http://www.austlii.edu.au/au/other/dfat/treaties/1988/22.html)
- the Agreement between the Government of Australia and the Government of the Republic of Korea on the Protection of Migratory Birds 2007 (ROKAMBA)—[www.austlii.edu.au/au/other/dfat/treaties/2007/24.html](http://www.austlii.edu.au/au/other/dfat/treaties/2007/24.html)
- The Convention on Wetlands of International Importance (Ramsar Convention) —[www.ramsar.org](http://www.ramsar.org)

For more information on conservation listings under the EPBC Act and related management objectives and protection measures, visit the following sites:

- [www.environment.gov.au/epbc/protect/species-communities.html](http://www.environment.gov.au/epbc/protect/species-communities.html)  
(listed threatened species)
- [www.environment.gov.au/epbc/protect/migratory.html](http://www.environment.gov.au/epbc/protect/migratory.html)  
(listed migratory species)
- [www.environment.gov.au/coasts/species/marine-species-list.html](http://www.environment.gov.au/coasts/species/marine-species-list.html)  
(listed marine species)
- [www.environment.gov.au/cgi-bin/sprat/public/sprat.pl](http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl)  
(species profile and threats database).



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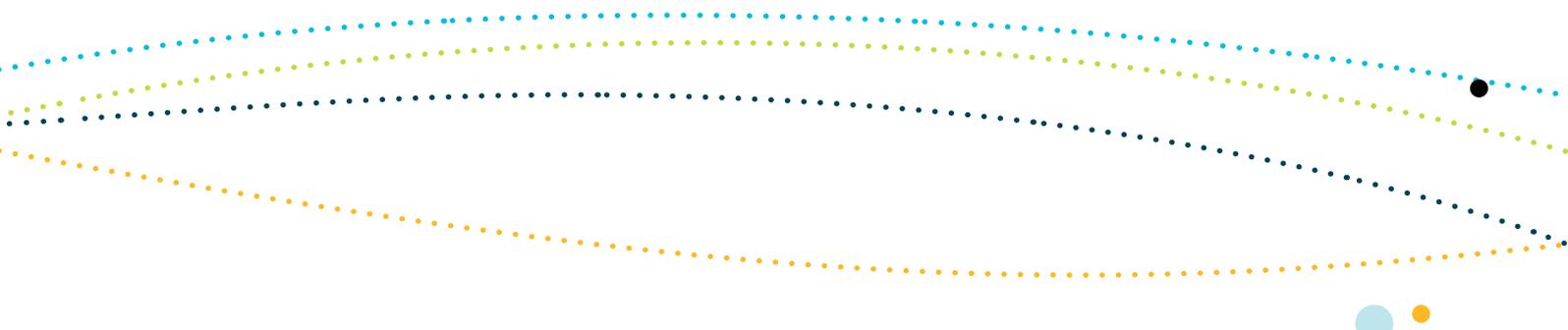
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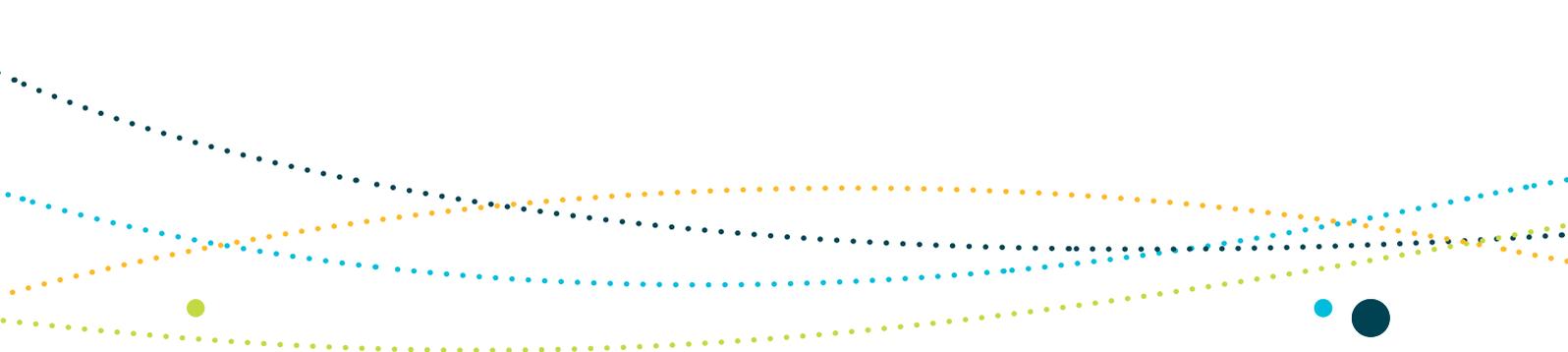
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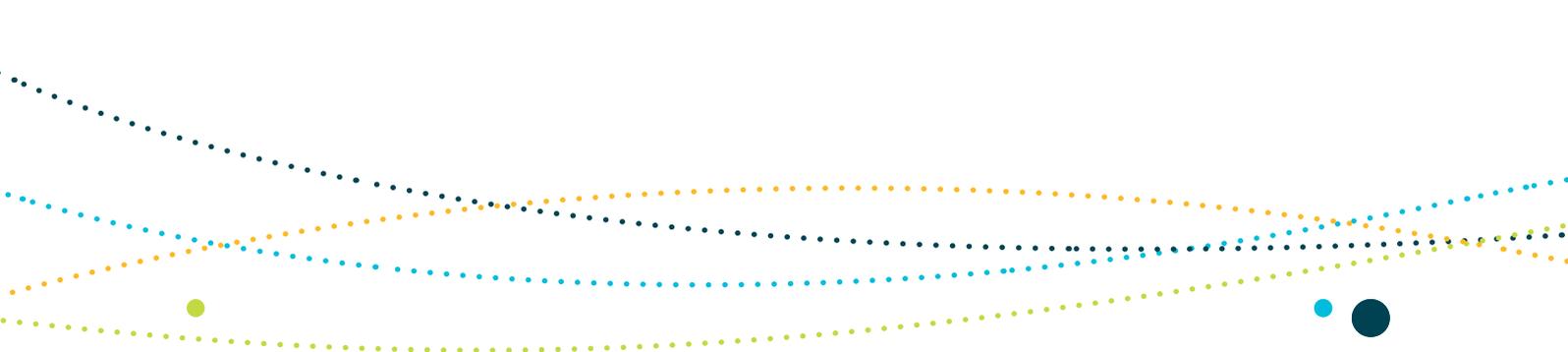
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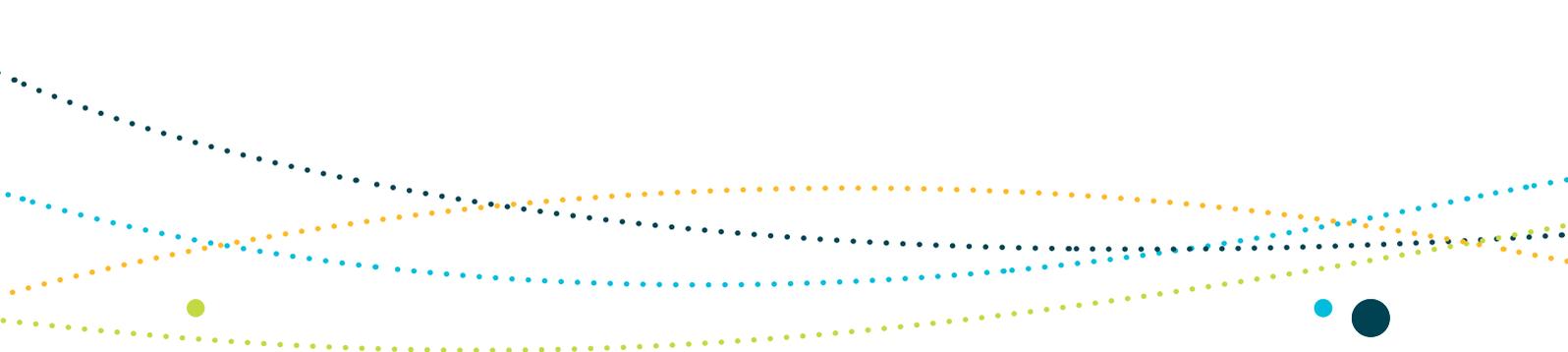
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# ATTACHMENT 1: SEABIRD SPECIES OCCURRING IN THE TEMPERATE EAST MARINE REGION

**Table A1: Listed seabird species known to occur in the Temperate East Marine Region**

Species (common name/scientific name) <sup>1</sup>	Conservation status
<b>Albatrosses</b>	
Antipodean albatross ( <i>Diomedea antipodensis</i> )	Vulnerable, migratory, marine
Black-browed albatross ( <i>Thalassarche melanophris</i> )	Vulnerable, migratory, marine
Campbell albatross ( <i>Thalassarche impavida</i> )	Vulnerable, migratory, marine
Indian yellow-nosed albatross ( <i>Thalassarche carteri</i> )	Vulnerable, migratory, marine
Salvin's albatross ( <i>Thalassarche salvini</i> )	Vulnerable, migratory, marine
Wandering albatross ( <i>Diomedea exulans</i> )	Vulnerable, migratory, marine
White-capped albatross ( <i>Thalassarche steadi</i> )	Vulnerable, migratory, marine
<b>Petrels and storm-petrels</b>	
Gould's petrel ( <i>Pterodroma leucoptera</i> )	Endangered, migratory
Southern giant-petrel ( <i>Macronectes giganteus</i> )	Endangered, migratory, marine
Northern giant-petrel ( <i>Macronectes halli</i> )	Vulnerable, migratory, marine
Providence petrel ( <i>Pterodroma solandri</i> )	Migratory, marine
Kermadec petrel ( <i>Pterodroma neglecta</i> )	Vulnerable, marine
Black-winged petrel ( <i>Pterodroma nigripennis</i> )	Marine
Great-winged petrel ( <i>Pterodroma macroptera</i> )	Marine
Black petrel ( <i>Procellaria parkinsoni</i> )	Migratory, marine

**Table A1: Listed seabirds known to occur in the Temperate East Marine Region**

Species (common/scientific name) <sup>1</sup>	Conservation status	Biologically important areas identified
<b>Petrels and storm-petrels</b>		
White-necked petrel ( <i>Pterodroma cervicalis</i> )	Marine	Yes
Wilson's storm-petrel ( <i>Oceanites oceanicus</i> )	Migratory, marine	Yes
White-bellied storm-petrel ( <i>Fregetta grallaria</i> )	Vulnerable, marine	Yes
White-faced storm-petrel ( <i>Pelagodroma marina</i> )	Marine	Yes
<b>Shearwaters</b>		
Flesh-footed shearwater ( <i>Ardenna carneipes</i> )	Migratory, marine	Yes
Short-tailed shearwater ( <i>Ardenna tenuirostris</i> )	Migratory, marine	Yes
Sooty shearwater ( <i>Ardenna grisea</i> )	Migratory, marine	Yes
Wedge-tailed shearwater ( <i>Ardenna pacifica</i> )	Migratory, marine	Yes
Little shearwater ( <i>Puffinus assimilis</i> )	Marine	No
<b>Penguins</b>		
Little penguin ( <i>Eudyptula minor</i> )	Marine	Yes
<b>Terns and noddies</b>		
Roseate tern ( <i>Sterna dougallii</i> )	Migratory, marine	No
White tern ( <i>Gygis alba</i> )	Marine	Yes
Crested tern ( <i>Thalasseus bergii</i> )	Marine	No
Sooty tern ( <i>Onychoprion fuscata</i> )	Marine	Yes
Grey ternlet ( <i>Procelsterna cerulea</i> )	Marine	Yes
Common noddy ( <i>Anous stolidus</i> )	Migratory, marine	Yes
Black noddy ( <i>Anous minutus</i> )	Marine	Yes
<b>Boobies</b>		
Masked booby ( <i>Sula dactylatra</i> )	Migratory, marine	Yes
<b>Tropicbirds</b>		
Red-tailed tropicbird ( <i>Phaethon rubricauda</i> )	Marine	Yes

<sup>1</sup> Taxonomy follows Christidis and Boles (2008), with the exception of the albatrosses species which follow the *Agreement on the Conservation of Albatrosses and Petrels* (ACAP 2011)

**Table A2: Listed seabird species known to occur in the Temperate East Marine Region on an infrequent basis**

Species (common name/scientific name) <sup>2</sup>	Conservation status
<b>Albatrosses</b>	
Amsterdam albatross ( <i>Diomedea amsterdamensis</i> )	Endangered, migratory, marine
Chatham albatross ( <i>Thalassarche eremita</i> )	Endangered, migratory, marine
Grey-headed albatross ( <i>Thalassarche chrysostoma</i> )	Endangered, migratory, marine
Northern royal albatross ( <i>Diomedea sanfordi</i> )	Endangered, migratory, marine
Tristan albatross ( <i>Diomedea dabbenena</i> )	Endangered, migratory, marine
Atlantic yellow-nosed albatross ( <i>Thalassarche chlororhynchos</i> )	Vulnerable, migratory, marine
Buller's albatross ( <i>Thalassarche bulleri</i> )	Vulnerable, migratory, marine
Shy albatross ( <i>Thalassarche cauta</i> )	Vulnerable, migratory, marine
Sooty albatross ( <i>Phoebastria fusca</i> )	Vulnerable, migratory, marine
Southern royal albatross ( <i>Diomedea epomophora</i> )	Vulnerable, migratory, marine
Light-mantled albatross ( <i>Phoebastria palpebrata</i> )	Migratory, marine
<b>Shearwaters</b>	
Streaked shearwater ( <i>Calonectris leucomelas</i> )	Migratory, marine
<b>Terns and noddies</b>	
Common tern ( <i>Sterna hirundo</i> )	Migratory, marine
Little tern ( <i>Sternula albifrons</i> )	Migratory, marine
Fairy tern ( <i>Sternula nereis</i> formerly known as <i>Sterna nereis</i> )	Vulnerable, marine
White-winged black tern ( <i>Chlidonias leucopterus</i> )	Migratory, marine
<b>Other</b>	
Arctic jaeger ( <i>Stercorarius parasiticus</i> )	Migratory, marine
Brown skua ( <i>Stercorarius antarcticus</i> )	Migratory, marine
Pomarine jaeger ( <i>Stercorarius pomarinus</i> )	Migratory, marine

<sup>2</sup> Taxonomy follows Christidis and Boles (2008), with the exception of the albatrosses species which follow the *Agreement on the Conservation of Albatrosses and Petrels* (ACAP 2011)

