

[1] "*Sterna albifrons* — Little Tern
Glossary SPRAT Profile
information to assist regulatory considerations, refer to Policy Statements and Guidelines, the Conservation Advice, the Listing Advice and/or the Recovery Plan. EPBC Legal Status and Documents Top EPBC Act Listing Status Listed marine as *Sterna albifrons* Listed migratory - EPBC Act as *Sterna albifrons*, Bonn as *Sterna albifrons*, CAMBA as *Sterna albifrons*, JAMBA as *Sterna albifrons*, ROKAMBA as *Sterna albifrons*
Under threatened listing assessment, due 30-Oct-2022. Approved Conservation Advice There is no approved Conservation Advice for this species Listing Advice Threatened Species Scientific Committee (TSSC) (2002). Commonwealth Listing Advice on *Sterna albifrons sinensis* (Little Tern (western Pacific)). Available from: <http://www.environment.gov.au/biodiversity/threatened/species/sterna-albifrons-sinensis.html>. In effect under the EPBC Act from 04-Jul-2002. Adopted/Made Recovery Plans There is no adopted or made Recovery Plan for this species Adopted/Made Threat Abatement Plans Department of the Environment (2015). Threat abatement plan for predation by feral cats. Canberra, ACT: Commonwealth of Australia. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/tap/threat-abatement-plan-feral-cats>. In effect under the EPBC Act from 23-Jul-2015. Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008). Threat abatement plan for predation by the European red fox. DEWHA, Canberra. Available from: <http://www.environment.gov.au/biodiversity/threatened/publications/tap/predation-european-red-fox>. In effect under the EPBC Act from 01-Oct-2008. Marine Bioregional Plans Department of Sustainability, Environment, Water, Population and Communities (DSEWPac) (2012). Marine bioregional plan for the North-west Marine Region. Prepared under the Environment Protection and Biodiversity Conservation Act 1999. Available from: <http://www.environment.gov.au/topics/marine/marine-bioregional-plans/north-west>. In effect under the EPBC Act from 27-Aug-2012. Department of Sustainability, Environment, Water, Population and Communities (DSEWPac) (2012). Marine bioregional plan for the North Marine Region. Prepared under the Environment Protection and Biodiversity Conservation Act 1999. Available from: <http://www.environment.gov.au/topics/marine/marine-bioregional-plans/north>. In effect under the EPBC Act from 27-Aug-2012. Other Commonwealth Documents Top Policy Statements and Guidelines Inshore and coastal foraging seabirds - A Vulnerability Assessment for the Great Barrier Reef (Great Barrier Reef Marine Park Authority (GBRMPA), 2011) [Admin Guideline]. Federal Register of Legislative Instruments Marine: Declaration under section 248 of the Environment Protection and Biodiversity Conservation Act 1999 - List of Marine Species (Commonwealth of Australia, 2000c) [Legislative Instrument] as *Sterna albifrons* Migratory: List of Migratory Species (13/07/2000) (Commonwealth of Australia, 2000b) [Legislative Instrument] as *Sterna albifrons* State Government Documents and Websites NSW: Little Tern - Profile (NSW Department of Environment, Climate Change and Water (NSW DECCW), 2005on) [Internet]. NSW: Little Tern (*Sterna albifrons*) Recovery Plan. NSW NSW National Parks & Wildlife Service, Hurstville. Viewed 26 May 2008 (NSW National Parks and Wildlife Service, 2003) [State Recovery Plan]. QLD: Little tern (Department of Environment and Heritage Protection (DEHP), 2013aj) [Database]. VIC: Flora and Fauna Guarantee Act 1988 Action Statement no. 51 - Little Tern *Sterna albifrons sinensis* (Reside, J., 2003) [State Action Plan]. State Listing Status NSW: Listed as Endangered (Biodiversity Conservation Act 2016 (New South Wales): February 2021 list) as *Sterna albifrons* VIC: Listed as Threatened (Flora and Fauna Guarantee Act 1988 (Victoria): January 2021 list) as *Sterna albifrons* Non-statutory Listing Status IUCN: Listed as Least Concern (Global Status: IUCN Red List of Threatened Species: 2020.2 list) NGO: Listed as Least Concern (The Action Plan for Australian Birds 2010 - non-threatened) Naming Top Scientific name *Sterna albifrons*

[82849] Family Laridae:Charadriiformes:Aves:Chordata:Animalia Species author (Pallas, 1764) Infraspecies author Reference Christidis, L. & Boles, W.E. (2008) Systematics and Taxonomy of Australian Birds, p 144. Other names Sterna albifrons [813] Distribution Map Top Distribution map The distribution shown is generalised from the Departments Species of National Environmental Significance dataset. This is an indicative distribution map of the present distribution of the species based on best available knowledge. Some species information is withheld in line with sensitive species policies. See map caveat for more information. Illustrations Top Illustrations Google Images Other Links, Including Superseded Commonwealth Documents Top Christidis, L. & W.E. Boles (2008). Systematics and Taxonomy of Australian Birds. Collingwood, Victoria: CSIRO Publishing. Commonwealth of Australia (2000b). List of Migratory Species (13/07/2000). F2007B00750. Canberra: Federal Register of Legislative Instruments. Available from: <http://www.comlaw.gov.au/Details/F2007B00750>. Commonwealth of Australia (2000c). Declaration under section 248 of the Environment Protection and Biodiversity Conservation Act 1999 - List of Marine Species. F2008B00465. Canberra: Federal Register of Legislative Instruments. Available from: <http://www.comlaw.gov.au/Details/F2008B00465>. Commonwealth of Australia (2007h). Environment Protection and Biodiversity Conservation Act 1999 - Listed Migratory Species - Approval of an International Agreement. F2007L02641. Canberra: Federal Register of Legislative Instruments. Available from: <http://www.comlaw.gov.au/Details/F2007L02641>. Department of the Environment and Heritage (DEH) (2006uy). Sterna albifrons in Species Profile and Threats (SPRAT) database. Unpublished species profile. Canberra, ACT: DEH. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=813. Environment Australia (EA) (1999a). NON-CURRENT Threat Abatement Plan for Predation by the European Red Fox. Biodiversity Group, Environment Australia. Available from: <http://www.environment.gov.au/archive/biodiversity/threatened/publications/tap/foxes/index.html>. In effect under the EPBC Act from 16-Jul-2000. Environment Australia (EA) (1999b). NON-CURRENT Threat Abatement Plan for Predation by Feral Cats. Biodiversity Group, Environment Australia. Available from: <http://www.environment.gov.au/archive/biodiversity/threatened/publications/tap/cats/index.html>. In effect under the EPBC Act from 16-Jul-2000. NSW National Parks and Wildlife Service (NSW NPWS) (1999co). Little Tern Threatened Species Information. Available from: <http://www.environment.nsw.gov.au/resources/nature/tsprofileLittleTern.pdf>. Tasmanian Department of Primary Industries, Parks, Water and Environment (2008n). Little Tern. Available from: <http://www.dpiw.tas.gov.au/inter.nsf/WebPages/BHAN-54GUJ7?open>. Anonymous (2009). Australian Faunal Directory. Australian Biological Resources Study. Available from: <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/search/names>. Newsletters Top EPBC Act email updates can be received via the Communities for Communities newsletter and the EPBC Act newsletter. Caveat Top This database is designed to provide statutory, biological and ecological information on species and ecological communities, migratory species, marine species, and species and species products subject to international trade and commercial use protected under the Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act). It has been compiled from a range of sources including listing advice, recovery plans, published literature and individual experts. While reasonable efforts have been made to ensure the accuracy of the information, no guarantee is given, nor responsibility taken, by the Commonwealth for its accuracy, currency or completeness. The Commonwealth does not accept any responsibility for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the information contained in this database. The information contained in this database does not necessarily represent the views of the Commonwealth. This database is not intended to be a complete source of information on the matters it deals with. Individuals and organisations should consider all the available information, including that available from other sources, in deciding whether there is a need to make a referral or apply for a permit or exemption under the EPBC Act. Citation: Department of the Environment (2022). Sternula albifrons in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>. Accessed Tue, 18 Jan 2022 21:53:06 +1100. Where available the sections below provide a biological profile for the species.

Biological profiles vary in age and content across species, some are no longer being updated and are retained as archival content. These profiles are still displayed as they contain valuable information for many species. The Profile Update section below indicates when the biological profile was last updated for some species. For information to assist regulatory considerations, please refer to Conservation Advice, the Recovery Plan, Policy Statements and Guidelines.

Australian and State/Territory Government Legal Status

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Tasmania: At the subspecies level, *Sternula albifrons sinensis* is listed as Endangered under the Threatened Species Protection Act 1995.

National and International: Listed as Least Concern (BirdLife International 2008a; Garnett & Crowley 2000). Garnett and Crowley (2000) indicate that it has been suggested that the species be considered as Conservation Dependent but argue that even if the total Australian population declined without active management it is still likely to be higher than it was before protection began. The species was formerly classed as vulnerable (Garnett 1993).

Taxonomy

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Scientific Name: *Sternula albifrons*

Common Name: Little Tern

Other English names: Least Tern, Eurasian Little Tern, European Little Tern, Eastern Little Tern, West African Little Tern, White-shafted Little Tern or Ternlet, Little Ternlet, Black-lored Tern, Sea-swallow (Avibase 2008b; BirdLife International 2008a; Cramp 1985; Gill & Wright 2006, 2008; Gochfeld & Burger 1996; Heather & Robertson 1997; Higgins & Davies 1996).

The Little Tern has often been placed in the genus *Sterna* (typical terns). Recent taxonomic research using mitochondrial DNA (Bridge et al. 2005) supported the subdivision of *Sterna* and recognized the genus *Sternula* for the 'little terns', which includes the Little Tern and Fairy Tern (*S. nereis*) (Christidis & Boles 2008).

The Little Tern is a conventionally accepted species (Christidis & Boles 2008; Higgins & Davies 1996). However, some authors (Johnstone & Storr 1998) have elevated the Australian subspecies, *S. a. sinensis*, to species status (as the White-shafted Little Tern).

Extraliminally, the Least Tern (*Sternula antillarum*) of the Americas has also been treated as a subspecies of Little Tern by some authors (AOU 1998; Massey 1976). The Little Tern, Fairy Tern, Least Tern, Yellow-billed Tern (*S. superciliaris*), Peruvian Tern (*S. lorata*) and Saunder's Tern (*S. saundersi*) appear to form a superspecies (AOU 1998; Cramp 1985; Higgins & Davies 1996; Thompson et al. 1997).

Description

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The Little Tern is a small, slender and elegant marine tern (total length 200.9628 cm; mean adult weight approximately 53 g for males, 49 g for females [Higgins & Davies 1996]) with narrow wings and a fairly long and deeply forked tail. Sexes do not differ in plumage or size.

Breeding plumage

Adults in breeding plumage have a diagnostic head-pattern, consisting of a neat black cap and tapering loreal stripe isolating a triangular white patch on the forehead that tapers to a point above the rear of the eye, and with the rest of the head and neck white. The rest of the upperparts are largely pale grey, with a contrastingly white rump, uppertail-coverts and tail, and a white line along the upper edge, and a thin black line along the bottom edge, of the folded primaries, and with slightly darker grey outer primaries. In flight the upperwing appears pale grey with a white trailing edge and thin black leading edge to the outerwing. The underparts are wholly white. The bill is bright yellow with a small black tip, the eyes blackish, and the legs and feet bright orange (Gochfeld & Burger 1996; Higgins & Davies 1996).

Non-breeding plumage

Adults are similar to breeding birds except the head-pattern differs, with the forehead, forecrown and anterior lores white-washed with grey, leaving a dark band extending from in front of the eyes to the nape, and that merges into dark spotting on the rear-crown. Non-breeding birds further differ by a pale-grey rump, uppertail-coverts and tail (concolorous with the rest of the upperbody), a less deeply forked tail, and a narrow dark cubital bar on the folded wing. The bill is also black, and the legs and feet duller, orange-brown (Gochfeld & Burger 1996; Higgins & Davies 1996).

Juveniles

Juveniles are like non-breeding adults but the black band on the head is narrower and duller; the white forehead, anterior lores and crown are washed brown; the mantle, back, scapulars and tertials are marked with narrow white scaling and bold brown U-shaped markings; there is a thin dark tail-band; and the upperwing-coverts are patterned much like the scapulars, and there is a dusky cubital bar on the upperwing. The bill is dark brown with a darker blackish tip and base, and the legs and feet are brownish orange (Gochfeld & Burger 1996; Higgins & Davies 1996).

Little Terns are typically gregarious throughout the year and generally seen in small flocks but sometimes forming large flocks, for example a flock of 1600 birds was observed one November, at Sawtell, NSW, and thousands have been observed roosting at some sites, such as off Caloundra. Little Terns usually breed in small colonies (of up to 50 birds), sometimes with other species of terns, including Fairy Terns, but will also breed solitarily. Non-breeding birds have been observed to roost separately from breeding birds. Little Terns have been observed to roost with Fairy Terns, Whiskered Terns, Common Terns (*S. hirundo*) and White-winged Black Terns (*Chlidonias leucopterus*) and other waders. Typically they forage in loose flocks, or at least with numbers of birds foraging in same area, particularly near breeding or roosting sites. They are also known to often forage

singly, or, occasionally, in small tight flocks. Little Terns forage in association with other species, including Fairy Terns, Crested Terns (*Thalasseus bergii*), shearwaters (*Puffinus* species) and cormorants. Occasionally individuals have food stolen by Silver Gulls (*Larus novaehollandiae*) or Kelp Gulls (*L. dominicanus*). The species is usually quite vocal and often heard calling while foraging, or around colonies, with the usual flight call a shrill, repeated kik. Colony members cooperate to mob predators, when they are quite vocal (Bolger 1984; Gochfeld & Burger 1996; Higgins & Davies 1996; Hill et al. 1988; Hulsman 1974; Owen 1990, 1991; Reside et al. 1989; Rogers 1977; Secomb 1994; Serventy et al. 1971; Starks 1992).

Australian Distribution

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The Australian breeding population can be divided into two major subpopulations: (1) a northern subpopulation that breeds across northern Australia, from about Broome in north-western Western Australia (where first recorded only in December 1995), through coastal Northern Territory (mainly from just west of Darwin to the Queensland border) to the Gulf of Carpentaria and eastern Cape York Peninsula (with an extended breeding season covering most of the year); and (2) an eastern subpopulation that breeds on the eastern and south-eastern coast of the mainland and northern and eastern Tasmania, occasionally extending as far west as western Victoria and south-eastern South Australia (and breeding in the austral spring-summer).

In addition, a third population of Asian migrants that spend the northern non-breeding season (austral spring-autumn) in Australia, and leave for their northern breeding grounds in March-April is recognised.

Non-breeding birds, of the Australian subpopulations and of extralimital populations, extend farther around the Australian coast than known breeding colonies, as well as overlapping extensively with the Australian breeding range. In Western Australia, the species regularly occurs south to approximately 20° S, with occasional records south of there (for example, Shark Bay). In south-eastern Australia, the species is generally rare west of Corner Inlet in Victoria, straggling as far west as south-eastern South Australia (where the species occasionally breeds). Little Terns have occurred as vagrants on Lord Howe and, probably, Norfolk Islands (Barrett et al. 2002b, 2003; Blakers et al. 1984; Carter 1998; Chan & Dening 2007; Chatto 2001; Collins & Jessop 1997a; Garnett & Crowley 2000; Harrison 1997; Hermes et al. 1986; Higgins & Davies 1996; Johnstone & Storr 1998; McAllan et al. 2004; Minton 1996a; Napier 1972; NSW National Parks and Wildlife Service 2003; Starks 1992; Stove 1994).

The estimated extent of occurrence of Little Tern in Australia is 20 000 km², with an increasing trend (Garnett & Crowley 2000). For example, breeding has only recently been confirmed, albeit in small numbers, near Broome, Western Australia, with first records in December 1995\u0096January 1996 (Collins & Jessop 1997a). This species has a large global range, with an estimated global extent of occurrence of between 1 000 000 and 10 000 000 km² (BirdLife International 2008a). The source of this estimate is not known, and there are no available data to indicate past declines or future changes.

The estimated area of occupancy of Little Tern in Australia is 500 km², and the trend is for an increase in area of occupancy with ongoing management of breeding sites of the species. The species is also expanding into areas where it was not recorded previously (Garnett & Crowley 2000).

The species is widespread in Australia, with breeding sites widely distributed from north-western Western Australia, around the northern and eastern Australian coasts to south-eastern Australia. In a summary of known Australian breeding sites, Garnett and Crowley (2000) indicate: several colonies in Western Australia; at least 37 colonies in the Northern Territory (possibly as many as 62+); 40 colonies in Queensland (though many not used recently); 75 colonies in NSW (44 of which in recent use); 16 colonies in Victoria (14 in recent use); 13 colonies in Tasmania (12 used recently); and two colonies in South Australia (only one of which used recently).

Confirmed breeding was recorded in 44 colonies in the Northern Territory, and is likely to occur at many more sites (Chatto 2001). Nesting in NSW is said to have been recorded at 70 sites along the coast (compared with 75 in Garnett & Crowley 2000), but at only 44 sites since 1977, and only 31 sites since 1987 (NSW National Parks and Wildlife Service 2003). During the mid- to late 1990s, nesting was recorded at 12 sites in 1995\u009616 sites in 1996\u0096eight sites in 1997\u0096and 11 sites in 1998\u0096 (NSW National Parks and Wildlife Service 2003).

There are no known captive populations of this species and the species has not been reintroduced into the wild in Australia or elsewhere.

The distribution of the Little Tern is not severely fragmented at large scales, though breeding colonies are patchily distributed at disjunct sites. The species has a widespread and almost continuous distribution from north-western Australia, around the northern and eastern coasts to south-eastern Australia, including Tasmania. However, breeding colonies are scattered at suitable and disjunct sites throughout this range, and the northern and eastern breeding are distinct subpopulations that overlap in the non-breeding season (Higgins & Davies 1996). Extraliminally, the species is also widely distributed from Europe to eastern and south-eastern Asia and Australasia. Three or four subspecies are usually recognized, though some authors recognise more (Avibase 2008b; Cramp 1985; Gochfeld & Burger 1996; Higgins & Davies 1996).

Global Distribution

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The Little Tern is

widely but patchily spread through Europe, southern, eastern and south-eastern Asia, Indonesia and Australasia. Breeding occurs from the British Isles, south to the Mediterranean Sea, including northern Africa, and east along the coasts of the North and Baltic Seas through central Russia, western China and Mongolia, to south-eastern Siberia, Japan, China and the Philippines. East of the Mediterranean Sea, breeding occurs through the Middle East to the Indian Subcontinent, south-eastern Asia and the Malay Archipelago, and south to New Guinea and northern and eastern Australia. The species is a recent colonist of Micronesia and, possibly Hawaii.

During the non-breeding season, Little Terns occur in coastal Baltic and Mediterranean Seas and the eastern Atlantic Ocean, from Scandinavia south to the Gulf of Guinea; in the western Indian Ocean, along the coast of Africa, including the Red Sea; in the Persian Gulf, north-eastern Arabian Sea, eastern Bay of Bengal and the Malay Peninsula. In the western Pacific Ocean, non-breeding birds range from southern Japan, the Korean Peninsula and eastern China, south through the Philippines, Indo-China, South-East Asia and Indonesia to New Guinea, the Solomon Islands, northern and eastern Australia and New Zealand. They are also regular migrants to islands in the tropical western Pacific Ocean and have been recorded in Hawaii, where they may also breed (Ali & Ripley 1969; AOU 1998; Blaber 1990; Bull et al. 1985; Clapp 1989; Coates 1985; Coates & Bishop 1997; Cramp 1985; Gochfeld & Burger 1996; Hadden 1981; Heather & Robertson 1997; Higgins & Davies 1996; Reichel et al. 1989; Urban et al. 1986; Watling 2001; White & Bruce 1986).

The Little Tern has a large global population (BirdLife International 2008a), variously estimated at 140 000 - 410 000 birds (Wetlands International 2002) or some 70 000 - 100 000 birds (Gochfeld & Burger 1996). Global population trends have not been quantified but the species is listed as Least Concern (BirdLife International 2008a). However, Gochfeld and Burger (1996) indicate many local populations are declining, and Wetlands International (2006) indicate that populations of several subspecies are also generally declining.

In Australia, it appears that the population and range of Little Terns are currently expanding, at least partly as a result of ongoing management of key breeding areas, particularly those in NSW and Victoria (Garnett & Crowley 2000; Ross et al. 1999). For example, in eastern Gippsland, Victoria, the population of Little Terns has increased since active management began, with numbers of breeding birds increasing from approximately 80 pairs in 1986 (Hill 1987) to >200 pairs in 1996 (Waldegrave-Knight et al. 1997).

The estimated proportion of the global population of Little Terns in Australia is 10% (Garnett & Crowley 2000). The Australian population is geographically distinct, with movements restricted to within Australia. However, birds from extralimital populations migrate to northern and eastern Australia in the austral summer. Nevertheless, genetic exchange between the Australian and extralimital breeding populations is likely to be low (Garnett & Crowley 2000; Higgins & Davies 1996; Minton 1996a).

Global climate change is a potential threat to this species but there appear to be no other global threats that are likely to affect the Australian population.

Surveys Conducted

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The Australian population of Little Terns is well surveyed, though there have been few published repeat surveys of the northern populations compared with the annual surveys of the much smaller eastern and south-eastern Australian breeding populations.

In northern Australia, Chatto (2001) conducted surveys of the entire Northern Territory coast for this, and other, species of breeding seabirds. Although breeding was confirmed at 44 colonies, Chatto considers the Little Tern highly likely to have additional unsurveyed colonies around the Northern Territory coast because breeding sites could not be confirmed until ground surveys were done and there were a number of probable sites located by aerial survey that were not checked on the ground. It was also highly likely that there are other sites that have been missed completely. Further, the survey results are also likely to be underestimates of the numbers breeding (Chatto 2001). Chatto (2001) indicates that there were a number of apparently suitable nesting sites between Darwin and the Western Australian border, where Little Terns were recorded but breeding was not, and that the coast for at least 80 km east of the Northern Territory-Queensland border is also likely to support Little Tern breeding sites.

In eastern Australia, most breeding sites, at least in NSW, Victoria, Tasmania and South Australia, are known and populations have been surveyed, with important sites monitored annually (NSW National Parks & Wildlife Service 2003).

Breeding and non-breeding Little Terns are often recorded during surveys for waders (Harrison 1997), in banding studies (Minton 1995; Reside 1996) and as part of specific surveys for terns (Collins 2000). Non-breeding Little Terns, along with other migrant and resident species of terns, were the target of a three-year study of terns on the Caloundra sandbanks in south-eastern Queensland (Chan & Dening 2007); and of a 16-month survey at the Noosa sandbanks 50 km north of Caloundra (Chan et al. 2008), with counts continuing to the present (J. Dening, 2008, pers. comm.).

More generally, some Australian breeding colonies have been surveyed, or non-breeding birds counted, as a result of ongoing efforts to describe the seabirds of Australia's islands (published in the Seabird Islands series, in the journal *Corella* [Australian Bird Study Association], for example, Walker & Oldroyd 1991). However, the islands

covered to date include few Little Tern breeding colonies, unlike other species of terns, in part because the species more frequently breeds on mainland sites than islands where most island surveys have been conducted (for example in Queensland) or does not breed where many islands have been surveyed (such as much of Western Australia). In a summary of the status of Queensland seabirds, King (1993) listed breeding of Little Terns on only one of the major seabird breeding islands in Queensland, but noted that the species bred occasionally on islands of the inner Great Barrier Reef (Walker 1989; Walker & Oldroyd 1991) and also on isolated mainland beaches. The species is also known to breed in the Wellesley islands in the Gulf of Carpentaria (Walker 1992).

Population Information

The Little Tern has a large global population (BirdLife International 2008a), variously estimated at some 140 000–410 000 individuals (Wetlands International 2002); 70 000–100 000 birds (Gochfeld & Burger 1996) or at least 173 000–285 000 birds (Wetlands International 2006), however this estimate may be unreliable. The estimated total breeding population in Australia is 3000 breeding pairs, but the reliability of this estimate is considered low (Garnett & Crowley 2000). The estimate of Ross and colleagues (1995), of 560–570 breeding pairs, is considerably lower than that of Garnett and Crowley (2000). The former study significantly underestimates the numbers breeding in the Northern Territory (11 pairs compared with Chatto's [2001] more recent surveys of a minimum 44 colonies, 20 of which comprised 11–100 birds and one involving at least 150 pairs).

There are apparently two subpopulations of breeding Little Terns in Australia, one of approximately 2500 breeding birds, the other of approximately 500 (Garnett & Crowley 2000). However, the limits of these populations are not properly known. While there is said to be a gap in the breeding distribution on the north-eastern coast, between about Bundaberg (25° S) and Mackay (21° S), it has also been suggested that the two subpopulations overlap around the Elliott River (approximately 20° S). There is also considerable overlap of breeding and non-breeding populations of the two Australian subpopulations as well as with non-breeding migrants from outside of Australia (Higgins & Davies 1996; NSW National Parks & Wildlife Service 2003).

The Little Tern has a large global population. Globally, trends in population have not been quantified but the species is not thought to approach the thresholds for the population decline criterion of the IUCN Red List (a decline of >30% in 10 years or three generations) (BirdLife International 2008a). The Australian population of Little Tern appears to be increasing (Garnett & Crowley 2000).

The Little Tern is not known to undergo extreme natural fluctuations in population or range. Nevertheless, numbers of non-breeding birds at sites in Australia can vary greatly from year to year though there is no knowledge of differential annual use of sites within Australia that may explain such differences. For example, at Caloundra, in south-eastern Queensland, the median count (with maximum annual counts in parentheses) over each of three years were 785 (4221), 1893 (11 373) and 1920 (7022) birds (Chan & Dening 2007).

The generation length is estimated at 5 years. The basis for this estimate is not known, and has a low reliability of the estimate (Garnett & Crowley 2000).

Whereas there are many known breeding colonies, few are large. However, at many sites where Little Terns breed, large numbers of non-breeding birds may also congregate (Chan & Dening 2007; Chatto 2001; Collins & Jessop 1997a).

In north-western Western Australia, known colonies are small, apparently <20 pairs, but counts of hundreds of non-breeding birds have been made (Collins & Jessop 1997a; Higgins & Davies 1996; Johnstone & Storr 1998). Breeding colonies of the Northern Territory coast ranged in size from single pairs up to approximately 150 pairs, with most colonies comprising 2–10 birds (n = 23 of a total 44 colonies) or 11–100 birds (n = 20), with only one larger colony that contained approximately 100 eggs and 50 young. However, it is highly likely that there are additional colonies and that the surveyed numbers are underestimates of the actual numbers breeding at a site. The major colonies were in the north-west, near Groote Eylandt, and the coast adjacent to, and including, the Sir Edward Pellew Group east to the Queensland border. Large numbers of non-breeding Little Terns were also recorded along the Northern Territory coast (Chatto 2001).

In eastern Australia, a total breeding population (based on the number of nests found) of 310–319 pairs was recorded in December 1989, including 56 breeding pairs in Queensland, 64–70 in NSW, at least 155 in Victoria, and four in Tasmania (Higgins & Davies 1996; Starks 1992). In 1996, Botany Bay was reported to have 50 breeding pairs (Priddel & Ross 1996). In NSW, there are 18 sites that have been used since 1990 and that supported at least four pairs, and 10 of these supported at least 20 pairs: Sawtell, Harrington-Manning Point, Farquhar Inlet-Old Bar, Forster, The Entrance, Botany Bay, Lake Wollumboola, South Tuross Heads, Wallaga Lake and Wallagoot Lake (NSW National Parks & Wildlife Service 2003). Large numbers of non-breeding birds (maximum counts of up to 11 300 birds) congregate at the Caloundra Sandbanks, in Moreton Bay, south-eastern Queensland (Chan & Dening 2007).

In Australia, Little Terns have hybridised with Fairy Terns (Cox & Close 1977; Higgins & Davies 1996; McCarthy 2006; Ross et al. 1999). Extraliminally, hybridisation with the Common Tern has also been reported (McCarthy 2006).

Land Tenure of Populations

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In eastern

Australia, many breeding colonies lie within conservation reserves, or within Ramsar-listed wetlands, or both. Little Terns occur in two Ramsar listed sites in NSW, Towra Point Nature Reserve and Hunter Estuary Wetlands (including Kooragang Nature Reserve), both of which are additionally reserves, or partly reserved, under the National Parks and Wildlife Act 1974 (NSW). In NSW, of the 29 nesting sites where breeding has been recorded since 1990, 15 are partly or wholly within reserves, and none is on freehold or leasehold tenure (NSW National Parks & Wildlife Service 2003). In Victoria, Little Terns occur in at least three Ramsar listed sites: Gippsland Lakes, Corner Inlet and Western Port. In eastern Queensland, the occurrence of Little Terns in reserves is less well described. Nevertheless, breeding has been recorded in the Bowling Green Bay (including Bowling Green Bay National Park) and the Coral Sea Reserves (Coringa-Herald and Lihou Reefs and Cays) Ramsar sites (Harrison 1997; Higgins & Davies 1996; EPA (Queensland) 2008), and is likely to occur in others.

In the Northern Territory, most colonies occur on Aboriginal land, though several are within conservation reserves (Chatto 2001). In addition, colonies on the Cobourg Peninsula fall within the Cobourg Peninsula Aboriginal Land & Wildlife Sanctuary Ramsar site. At least one of the poorly known breeding colonies around Broome in northern Western Australia lies within the Roebuck Bay Ramsar site.

Non-breeding birds also congregate in large numbers at some sites, including many of these breeding sites. However, other sites are used for roosting only and breeding has not been recorded (or at least not in recent times). For example, in south-eastern Queensland, maximum counts of up to 11 300 migrant non-breeding Little Terns roost on the Caloundra sandbanks in Moreton Bay from about late October to mid-April. The Caloundra sandbanks lie within the Moreton Bay Marine Park, which is also a designated Ramsar site and should be regarded as an Area of International Importance based on criteria contained in the Ramsar Convention (Chan & Dening 2007; Dening 2003).

Habitat

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In Australia, Little Terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets, especially those with exposed sandbanks or sand-spits, and also on exposed ocean beaches. Little Terns are widespread on islands off the Northern Territory coast but appear to be less often on offshore continental islands or coral cays off Queensland (Chatto 2001; Higgins & Davies 1996; Hill et al. 1988; Johnstone & Storr 1996; NSW National Parks and Wildlife Service 2003). In the Northern Territory, Little Terns are commonly seen in sandy coastal habitats and in mangrove-mudflat habitats along the coast or in bays and estuaries, but not recorded on wetlands more than 1 km from the coast (Chatto 2001).

Little Terns nest on sand-spits, banks, ridges or islets in sheltered coastal environments, such as coastal lakes, estuaries and inlets, and also on wide and flat or gently sloping sandy ocean beaches, and also, occasionally, in sand-dunes. In the Northern Territory, colonies are always on sandy beaches, often mixed with shells or coral rubble, placed just above the high-tide mark, in among the dunes or on open blow-out areas among or behind the dunes. Elsewhere, Little Terns readily use artificial banks, islets, dunes or excavated areas created from dredge-spoil, gravel or shell, though nests in newly created habitats are sometimes abandoned because substrates are unstable or overheat (Chatto 2001; Collins & Jessop 1997a; Egan & Smith 1994; Higgins & Davies 1996; Hill et al. 1988; Larkins 1984; Morris 1979; NSW National Parks and Wildlife Service 2003; Owen 1990, 1991; Reside et al. 1989; Smith 1990b; Starks 1992; Vincent 1983). In the Northern Territory, Little Terns were the only species of tern that regularly nested on remote mainland beaches and large islands, though they also nested on the beaches of small offshore islands, all of which were within approximately 25 km of the mainland or another large island or island chain with most within a few kilometres of either the mainland or a large island (Chatto 2001). Chicks will hide in dunes, under vegetation and even in crab holes and artificial shelters (Neilly 2002).

Little Terns forage in shallow waters of estuaries, coastal lagoons and lakes, frequently over channels next to spits and banks or entrances, and often close to breeding colonies. They also forage along open coasts, especially around bars off the entrances to rivers and lagoons, less often at sea, and usually within 50 m of shore. In the Gippsland Lakes, the entrance channel to the lakes is an important feeding site, with numbers feeding there increasing on flood tides and decreasing on ebb tides (Higgins & Davies 1996; Owen 1990, 1991; Reside et al. 1989; Smith 1990b; Taylor & Roe 2005).

Little Terns usually roost or loaf on sand-spits, banks and bars within sheltered estuarine or coastal environments, or on the sandy shores of lakes and ocean beaches (Bolger 1984; Chan & Dening 2007; Chan et al. 2008; Chatto 2001; Dening 2003; Owen 1990, 1991; Reside et al. 1989; Vincent 1983). They prefer sheltered sand-spits that are surrounded by narrow shallow channels within lakes, to more exposed spits in large lakes, which are, in turn, preferred to ocean beaches (Reside et al. 1989). In the Northern Territory, Little Terns roost on saline mudflats just inland of the coast or in the estuaries of larger river mouths and in sandy coastal habitats (Chatto 2001).

The species is not known to use refuge habitats.

Little Terns are not known to rely specifically on any threatened ecological community in Australia, nor are they specifically associated with any threatened species though they potentially share habitat with such species. The species is, however, associated with a

number of Ramsar sites.

Life Cycle

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Little Terns probably first breed at two to three years old, but possibly when one year old occasionally (Higgins & Davies 1996; Minton 1990; NSW National Parks & Wildlife Service 2003; Owen 1991). Extraliminally, average age of first breeding said to be three years old, occasionally two years (Cramp 1985; Gochfeld & Burger 1996). Little Terns can be long lived; the oldest recovery of a Little Tern in Australia is of a bird at least 17 years 6 months old (Anon. 1995b). Extraliminally, Little Terns have reached 21 years old (Gochfeld & Burger 1996); and annual survival rate for adult Little Terns in Britain has been estimated at approximately 78% (Haddon & Knight 1983). Greatest mortality is associated with naturally low rates of breeding success, which has been exacerbated by human disturbance or human-induced failure (Garnett & Crowley 2000; Gochfeld & Burger 1996).

Little Terns usually nest in small colonies, but solitary breeding has also been recorded. In Australia, colonies are typically up to 50 pairs, but colonies of up to 150 pairs or nests have been recorded (Chatto 2001; Higgins & Davies 1996; Morris 1979; Hill et al. 1988; NSW National Parks & Wildlife Service 2003; Reside et al. 1989). Other species can be associated with colonies: Little Terns sometimes nest in colonies of Fairy Terns or vice versa; and plovers (*Charadrius*, *Thinornis* species) and oystercatchers (*Haematopus* species) sometimes nest within or at edge of colonies. Silver Gulls often nest close to or in Little Tern colonies (Chatto 2001; Higgins & Davies 1996; Owen 1990, 1991; Schipper & Weston 1998; Starks 1992).

The breeding season of the Little Tern varies between the subpopulations of northern and eastern Australia. In the Northern Territory, Little Terns have an extended breeding season, with breeding recorded from April to early January, with the main periods being late April-July and September-early January (Chatto 2001). Formerly, far more limited data from northern Australia, mainly from the Gulf of Carpentaria and Cape York Peninsula, indicated breeding in the austral autumn-winter, with breeding reported April-July and December and eggs recorded mid-April to late June and in October, consistent with the more recent observations from the Northern Territory (Garnett & Crowley 2000; Higgins & Davies 1996; Starks 1992). The eastern subpopulation breeds in the austral spring-summer, with laying from late August to January-February, more usually beginning late October and with peak laying in late November to mid-December. Laying tends to begin later in the south-east, e.g. November in Tasmania (Campion 1963; Higgins & Davies 1996; Napier 1972, 1978; NSW National Parks & Wildlife Service 2003; Reside et al. 1989; Smith 1995b). The nest of the Little Tern is usually a simple, shallow scrape or depression in sand, sometimes placed close to driftwood, beachcast seaweed, other debris or vegetation. However, Little Terns tend to avoid vegetated areas and will abandon a traditional nesting site if it becomes too overgrown (Campion 1963; Chatto 2001; Clancy 1987; Higgins & Davies 1996; Larkins 1984; NSW National Parks & Wildlife Service 2003). Little Terns lay a clutch of between one and three eggs. Birds re-lay after failure (Clancy 1987; Higgins & Davies 1996; Larkins 1984; Napier 1972, 1978; NSW National Parks & Wildlife Service 2003). Breeding success is often low, with overall success of only 6.5% (eggs resulting in fledglings) at some colonies in eastern Australia (Higgins & Davies 1996; Larkins 1984; Napier 1972, 1978; Owen 1991; Reside et al. 1989). However, success has changed over time and with active management of breeding colonies. For example, in NSW, hatching success was higher in the 1960s than in the 1980s, 1990s or 2000s, mainly owing to lower levels of predation of eggs in the 1960s at the colonies studied, and fledging success was poor at colonies studied in the 1980s, but better at colonies studied in the 1990s and 2000s, when more intensive management efforts were being made. Between 1993 and 2003 at least 2210 young are known to have fledged from a total of at least 4004 nests (NSW National Parks & Wildlife Service 2003).

Ground-nesting on sandy beaches and close to the high-tide mark makes eggs and chicks of Little Terns liable to loss or destruction by high and storm tides; flooding; covering of eggs by sand on windy days; abandonment of nests by parents in poor weather; predation by ground predators, such as introduced Red Foxes (*Vulpes vulpes*), domestic and feral Dogs (*Canis familiaris*), Cats (*Felis catus*), Black Rats (*Rattus rattus*) and Brown Rats (*R. norvegicus*), Ghost Crabs (*Ocypode cordimana*), ants (*Iridomyrmex gracilis*), and reptiles. Silver Gulls are also a major predator of eggs and small chicks at some colonies; and a number of other avian predators have been reported, such as Pied Oystercatchers (*Haematopus longirostris*) and Black-breasted Buzzard (*Hamirostra melanosternon*).

Little Terns are also highly susceptible to human disturbance when nesting, directly through loss of eggs and young by trampling, crushing by vehicles or by keeping parents from nests, or indirectly by depredation by gulls, which can increase if adults are disturbed from their nests. In eastern Australia, human disturbance is often greatest in spring-summer, when birds are breeding. Predation or disturbance can result in the desertion of whole colonies (Chatto 2001; Egan 1990; Egan & Webb 1999; Garnett 1985b; Higgins & Davies 1996; Hill et al. 1988; Larkins 1984; Morris 1979; Napier 1972; Owen 1991; Reside et al. 1989; Rose 1994, 2001; Secomb 1994; Starks 1992; Vincent 1983).

Feeding

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Little Terns feed mainly on small fish (< 10 cm in length), but also eat crustaceans, insects, annelids and

molluscs (Cramp 1985; Gochfeld & Burger 1996; Higgins & Davies 1996; Johnstone & Storr 1996; NSW National Parks & Wildlife Service 2003; Urban et al. 1986). Breeding Terns on Rigby Island, in the Gippsland Lakes of Victoria, fed their chicks entirely on juvenile fish of the families Clupeidae, Engraulidae, Pomatomidae and Carangidae, including Pilchards (*Sardinops neopilchardus*), Southern Anchovies (*Engraulis australis*) and Blue Sprats (*Spratelloides robustus*) (Taylor & Roe 2005). Families of fish taken in NSW (Forster and Botany Bay), include the families Centropomidae, Clupeidae, Eleotrididae, Exocoetidae, Mugilidae, Poeciliidae, Pomatomidae, Scorpionidae, Sillaginidae and Tetraodontidae (Higgins & Davies 1996; NSW National Parks & Wildlife Service 2003) and the family Atherinidae is also taken in Australia (Higgins & Davies 1996).

Little Terns forage singly, or in small loose flocks and occasionally in tighter flocks. Little Terns are primarily diurnal, and feed by plunging in shallow water of channels and estuaries, or in surf on beaches, typically from 3 m above the surface though up to 13 m above water. The species also gleans from surface of water (Chafer & Brandis 1991; Davies 1981; Hulsman 1974; Owen 1990, 1991; Reside et al. 1989; Taylor & Roe 2005).

Movement Patterns

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Globally, and in Australia, Little Terns are variously resident, or wholly or partly migratory. Within Australia, there are three distinct populations of Little Tern: the two breeding subpopulations of northern and eastern Australia (which may overlap at ~20° S in north-eastern Queensland), and a non-breeding population that migrates from breeding grounds in Asia to spend the austral spring-summer in Australia.

The northern Australian subpopulation has a protracted breeding season, with breeding recorded in most months of the year but with most activity in late April-July and September-early January (and not simply autumn-winter as earlier suggested). The movements of this population, if any, are poorly known. Numbers are lowest in the dry season (winter), which may represent departure of Asian migrants from the area rather than any movement of the northern Australian population, but there is no hard data. Also, while there is no evidence of movement of any of the northern Australian population to eastern and south-eastern Australia, it is possible (Chatto 2001; Garnett & Crowley 2000; Higgins & Davies 1996; Starks 1992).

The eastern Australian subpopulation is migratory, breeding in spring-summer and leaving colonies late summer-autumn and largely vacating southern Australia. The non-breeding range of this population is poorly known, but Australian birds have been recorded in Indonesia. Birds returned to their breeding sites in late winter-early spring (Blakers et al. 1984; Chafer & Brandis 1991; Cramp 1985; Higgins & Davies 1996; Owen 1990, 1991; Reside 1994; Reside et al. 1989; Starks 1992; Vincent 1983).

The Asian population is partly resident and partly migratory. Migrants from this population are non-breeding visitors to Australia, leaving their breeding range in August-October, and arriving in Australia in spring. Asian migrants leave in late summer-autumn but there are no details of movements or passage. There have been several confirmed movements of banded birds between Japan and Australia (Cramp 1985; Higgins & Davies 1996; Minton 1996a; Morris 1979; Starks 1992).

The longest movement of a bird banded in Australia is one that was recaptured in Japan, 8224 km from the original banding site (Anon. 1997b).

When breeding, birds defend a small area around the nest (Higgins & Davies 1996; Owen 1990). Foraging ranges, when breeding or not, are not known.

Survey Guidelines

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Within Australia, especially in breeding plumage, the species is distinctive and should not be confused with the similar Fairy Tern. However, the two species are more easily confused in non-breeding and subadult plumages. There is also some risk of confusion with Black-naped Tern (*Sterna sumatrana*) in non-breeding plumages (Higgins & Davies 1996). The Little Tern is very difficult to distinguish from Saunders's Tern, with which considered conspecific by some authors, though the ranges of the two are not known to overlap in Australia.

Most surveys of the species are ground counts conducted by researchers moving on foot on the shoreline or from boats. Access to some areas for survey purposes, especially island colonies, needs to be by boat or by aircraft (Chan & Dening 2007; Chatto 2001). The species has been counted, and probable breeding colonies located, using aerial surveys of the coast of the Northern Territory, using both fixed-wing aircraft and helicopters (Chatto 2001). Surveys of breeding birds need to be conducted when birds are nesting. Surveys at sea would use standard seabird-counting methods from vessels.

Threats

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Little Terns have a naturally high rate of breeding failure, with ground-nesting making the species vulnerable to a wide range of natural events that contribute to low success, such as loss of eggs and chicks through native predators, flooding of nesting sites (including high tides), and adverse weather conditions. However, high rates of failure have been exacerbated by increased or novel threats since the arrival of Europeans, particularly near centres of human settlement. Nesting sites are sometimes destroyed or completely abandoned (at least temporarily) as a direct result of human disturbance or increased levels of predation associated with humans, such as by domestic or feral Dogs and Cats, or rats. Silver Gulls are also a major predator of eggs and small chicks at some colonies, and increased

numbers of Gulls near cities and other settlements may result in increased predation of Little Terns. Human disturbance further indirectly exacerbates predation by Silver Gulls by disturbing adults from nests allowing predation of eggs and chicks. Some colonies have been disturbed or destroyed by residential, recreational and industrial developments, including sand-mining and establishment of waste-disposal dumps (Chatto 2001; Garnett & Crowley 2000; Gibson 1977; Higgins & Davies 1996; Hill et al. 1988; Larkins 1984; Morris 1979; NSW National Parks & Wildlife Service 2003; Reside et al. 1989; Smith 1990b).

More generally, Little Terns may also be threatened by loss or degradation of estuarine habitats through development or changes to estuarine morphology and hydrology, and potential or actual impacts on the quantity and quality of food supplies through pesticide residues and other pollutants, over-fishing, and oiling of both birds and beaches (Higgins & Davies 1996; NSW National Parks & Wildlife Service 2003; Smith 1990b). In the Northern Territory, while occurring, it is unlikely that Aboriginal egg collection is a significant factor owing to the asynchrony of nesting, the small size of eggs, and the small and diffuse structure of colonies and the resultant difficulty in finding them (Chatto 2001).

Interbreeding has been recorded between this species and the Fairy Tern in south-eastern mainland Australia, and it has been suggested that this may constitute a threat to the genetic integrity of the two taxa in the future (Garnett & Crowley 2000).

In addition to the impacts on breeding sites, the Caloundra and Noosa sandbanks, in south-eastern Queensland, are major roosting sites for non-breeding Little Terns (with counts of up to 11 300 birds). Both sites are adjacent to large and rapidly growing human population centres and subject to increasing levels of human recreational and tourism activity (such as boating, kite-surfing, diving, fishing, bait gathering, and use of jet-skis, and similar motorised personal watercraft), some of which are known to affect the behaviour of birds and all of which potentially threaten the use of the area by terns (and other species). Further, populations of Little Terns at this site are greatest in summer, which is also when human activity in the surrounding waters peaks (Chan & Dening 2007; Chan et al. 2008; Dening 2003). At the Noosa sandbanks, most human disturbance occurred during high tide and on sandbanks closest to the mainland, with people and dogs the most common human-related disturbances. Human disturbance were greatest on weekends and public holidays and on some sandbanks during such times, birds were completely excluded by the sheer volume of people present (Chan et al. 2008).

On Rigby Island, in the Gippsland Lakes, Victoria, there was mass mortality of Pilchards in the area in 1995 and in 1998. There was no evidence that breeding success or the number of pairs breeding were adversely affected by the 1995 mass-mortality event, but breeding success was reduced significantly in 1999 and 2000 following the second event. The 1995 event mainly affected larger size classes of Pilchard, whereas the 1998 event also affected younger age-classes, which may explain why Terns were adversely affected by the second event (Taylor & Roe 2005). A severe hailstorm in Gippsland, Victoria, in the 2001 breeding season killed at least 38 adult Little Terns, and many Fairy Terns (Olsen et al. 2003).

Threat Abatement and Recovery

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Monitoring and management of breeding and roosting sites throughout eastern Australia needs to continue to ensure the continued survival of the species, especially in areas with high rates of disturbance. Management strategies vary annually and from site to site, but include (Garnett & Crowley 2000; Higgins & Davies 1996; Hill et al. 1988; NSW National Parks & Wildlife Service 2003; Owen 1991; Reside 1994; Reside et al. 1989; Waldegrave-Knight et al. 1997): protection and maintenance of known and potential habitat, including the implementation of protection zones and grooming of breeding sites to maintain suitable levels of vegetation; minimising human disturbance through measures such as fencing and sign posting of main breeding and roosting sites and patrolling by wardens; control of Foxes, Dogs and Cats (including the use of electric fencing); displacing birds from flood-prone or other inappropriate sites by flagging beaches with lines of bunting or raising nests on sandbags; monitoring of populations through bird-banding and surveys; public awareness campaigns, including use of local community groups as site wardens.

In south-eastern Australia, many nesting, roosting and feeding sites are near popular summer recreational areas. To prevent disturbance of Little Terns at these sites, people, vehicles and dogs need to be kept away from active sites during the breeding season. The areas involved are typically small, the breeding season is fairly short (albeit when maximum recreation is likely to occur), and in the context of the whole estuary or local coastline, usually represent only a minor imposition on recreational amenity. Experience has shown that, with education, most people respect the need to protect the species and their contact with the management program enhances rather than detracts from their recreational experience (Chan & Dening 2007; NSW National Parks & Wildlife Service 2003; Reside 1994).

In eastern Australia, the identification of the Caloundra and Noosa sandbanks as major roosting sites for non-breeding Little Terns, as well as other migratory and resident terns, has been a significant step towards protection of the sites. Ongoing counts and management at this site are aiming to protect the area for this and other species of tern. In mitigation, the Caloundra sandbanks lie within the Moreton Bay Marine

Park, which is also a designated Ramsar site (Chan & Dening 2007; Dening 2003). At Caloundra, signs have also been placed strategically to inform the public of the importance of the site for terns. The work of Chan and Dening (2007) has also alerted government managers to the importance of the site to migratory terns. They also suggest that additional mitigation measures may need to be considered, one being the introduction of a buffer zone around the sandbanks to keep human traffic away from roosting birds to reduce the effect of disturbance.

At the Noosa sandbanks, Chan and colleagues (2008) suggest that promotion of nature-based tourism focussing on the terns could be a means of protecting them and their roosting habitat with closure of the principal roosting sites at peak times of use by terns. A section of the sandbanks is now closed to the public between October and March and accompanied with signage. Further, Chan and colleagues (2008) indicate that a common management plan needs to be in place for all the sandbanks and estuaries within the Caloundra-Noosa system, and declaration of the region as a Ramsar site. Further work is also needed to determine the use of other estuaries by the same birds in the region, including the Maroochy estuary and the Great Sandy Strait.

In addition to management actions mentioned above, Garnett and Crowley (2000) also indicate the need to: determine the genetic relationship with the Fairy Tern and to determine the extent of interbreeding with Fairy Terns and whether it is likely to be exacerbated by ongoing management actions; and to determine the extent of philopatry to breeding colonies and the level of genetic interchange between colonies.

Mitigation Approach

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NSW and Victoria have prepared management documents for the Little Tern (recovery plan and action statement respectively). The NSW recovery plan suggests that properly managed colonies are likely to continue to increase exponentially and colonies will reach carrying capacity, at which point it is predicted they will operate as source populations for other sites along the NSW coast (and potentially elsewhere) and establish colonies at previously successful, but now uninhabited sites, or establish new sites. The Recovery Plan seeks to implement management that:

- informs and liaises with relevant land managers and promotes a co-ordinated approach to management
- intensively manages eight major colonies and selected minor colonies, with measures such as discouraging nesting in unfavourable sites and controlling encroaching vegetation, predators and human disturbance
- investigates possible creation of new nesting habitat; acquires additional nesting sites by NSW National Parks & Wildlife Service
- surveys, monitors and conducts research on the species
- continues to educate the community and welcome community participation in the Recovery Program (NSW National Parks & Wildlife Service 2003).

Similar measures are proposed in the Victorian action statement (Reside 1994). On all islands, strategies developed for management of human visitation to islands of the Great Barrier Reef (Stokes et al. 1996) and more widely (WBM Oceanics & Claridge 1997) would mitigate disturbance to Little Terns.

Major Studies

Top

There are many small studies of the species within Australia, with detailed summaries of current knowledge of the species in Higgins and Davies (1996). The work of Chatto (2001) in the Northern Territory greatly increased knowledge of the population, range, movements and breeding of the northern Australian subpopulation. In eastern Australia, important studies that focus on or include significant information on Little Terns are: Chan and Dening (2007), Chan and colleagues (2008), Taylor and Roe (2005), and Vincent (1983).

There have been many overseas studies, much of which is summarized in major works on the birds of these regions, especially Ali and Ripley (1969), Cramp (1985), Gochfeld and Burger (1996) and Urban and colleagues (1986).

Management Documentation

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Key management documentation relating to this species are the New South Wales Little Tern Recovery Plan (NSW National Parks & Wildlife Service 2003) and the Victorian Little Tern Action Statement (Reside 1994).

The Victorian Department of Sustainability and Environment (2003c) has also implemented the Gippsland Lakes Ramsar Site: Strategic Management Plan, that involves management actions that assists this species.

Marine Bioregional Plans

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Marine bioregional plans have been developed for four of Australia's marine regions - South-west, North-west, North and Temperate East. Marine Bioregional Plans will help improve the way decisions are made under the EPBC Act, particularly in relation to the protection of marine biodiversity and the sustainable use of our oceans and their resources by our marine-based industries. Marine Bioregional Plans improve our understanding of Australia's oceans by presenting a consolidated picture of the biophysical characteristics and diversity of marine life. They describe the marine environment and conservation values of each marine region, set out broad biodiversity objectives, identify regional priorities and outline strategies and actions to address these priorities. Click here for more information about marine bioregional plans.

The Little Tern has been identified as a conservation value in the North-west (DSEWPaC 2012y) and North (DSEWPaC 2012x) marine regions. See Schedule 2 of the North-west Marine Bioregional Plan (DSEWPaC 2012y) for regional advice. Maps of Biologically Important Areas have been developed for Little Tern in the

North-west (DSEWPaC 2012y) Marine Region and may provide additional relevant information. Go to the conservation values atlas to view the locations of these Biologically Important Areas. The "species group report card - seabirds" for the North-west (DSEWPaC 2012y) and North (DSEWPaC 2012x) marine regions provide additional information.

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