

[1] "*Calidris ruficollis* — Red-necked Stint

Glossary SPRAT Profile

For 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 Listed migratory - EPBC Act, Bonn, CAMBA, JAMBA, ROKAMBA

Approved Conservation Advice

There is no approved Conservation Advice for this species

Listing Advice

There is no Listing Advice for this species

Adopted/Made Recovery Plans

There is no adopted or made Recovery Plan for this species

Adopted/Made Threat Abatement Plans

No Threat Abatement Plan has been identified as being relevant for this species

Wildlife Conservation Plans

Commonwealth of Australia (2015). Wildlife Conservation Plan for Migratory Shorebirds. Canberra, ACT: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/publications/wildlife-conservation-plan-migratory-shorebirds-2016>. In effect under the EPBC Act from 15-Jan-2016.

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.

Other Commonwealth Documents

Top Other EPBC Act Plans

EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EBBC Act listed migratory shorebird species (Department of the Environment, 2015) [Admin Guideline].

Policy Statements and Guidelines

National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds (Department of the Environment and Energy, 2020) [Admin Guideline].

Seagrass - A Vulnerability Assessment for the Great Barrier Reef (Great Barrier Reef Marine Park Authority (GBRMPA), 2011) [Admin Guideline].

Shorebirds - A Vulnerability Assessment for the Great Barrier Reef (Great Barrier Reef Marine Park Authority (GBRMPA), 2011) [Admin Guideline].

Information Sheets

Migratory Shorebirds of the East Asian - Australasian Flyway: Population estimates and internationally important sites (Bamford M., D. Watkins, W. Bancroft, G. Tischler & J. Wahl, 2008) [Information Sheet].

Revision of the East Asian-Australasian Flyway Population Estimates for 37 listed Migratory Shorebird Species (Hansen, B.D., R.A. Fuller, D. Watkins, D.I. Rogers, R.S. Clemens, M. Newman, E.J. Woehler & D.R. Weller, 2016) In effect under the EPBC Act from 29-May-2017. [Information Sheet].

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]

Migratory: List of Migratory Species (13/07/2000) (Commonwealth of Australia, 2000b) [Legislative Instrument]

Wildlife Conservation Plan: Wildlife Conservation Plan for Migratory Shorebirds (Commonwealth of Australia, 2006r) [Legislative Instrument]

Wildlife Conservation Plan: Environment Protection and Biodiversity Conservation Act 1999 - Section 285 - Instrument revoking and making a wildlife conservation plan (Commonwealth of Australia, 2016) [Legislative Instrument]

State Government Documents and Websites

QLD: Shorebirds (Department of Environment and Heritage Protection (DEHP), 2013bi) [Internet].

Non-statutory Listing Status

IUCN: Listed as Near Threatened (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

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Scientific name *Calidris ruficollis* [860]

Family Scolopacidae: Charadriiformes: Aves: Chordata: Animalia

Species author (Pallas, 1776)

Infraspecies author

Reference

Distribution Map

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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
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Other Links, Including Superseded Commonwealth Documents
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Australian Government Department of the Environment and Heritage (AGDEH) (2006f). Wildlife Conservation Plan for Migratory Shorebirds. Canberra, ACT: Department of the Environment and Heritage. Available from: <http://www.environment.gov.au/biodiversity/migratory/publications/shorebird-plan.html>. In effect under the EPBC Act from 25-Feb-2006. Ceased to be in effect under the EPBC Act from 15-Jan-2016.

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, Water, Heritage and the Arts (DEWHA) (2009aj). Draft Significant impact guidelines for 36 migratory shorebirds Draft EPBC Act Policy Statement 3.21. Canberra, ACT: Commonwealth of Australia. Available from: <http://www.environment.gov.au/epbc/publications/migratory-shorebirds.html>.

Department of the Environment, Water, Heritage and the Arts (DEWHA) (2009bc). Draft background paper to EPBC Act policy statement 3.21. Canberra, DEWHA. Available from: <http://www.environment.gov.au/epbc/publications/migratory-shorebirds.html>.

Newsletters
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EPBC Act email updates can be received via the Communities for Communities newsletter and the EPBC Act newsletter.

Caveat
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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). *Calidris ruficollis* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>. Accessed Tue, 18 Jan 2022 20:37:33 +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.

Taxonomy
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Scientific name: *Calidris ruficollis* Common name: Red-necked Stint Other names: Rufous-necked Stint, Little Sandpiper, Land Snipe, Least Sandpiper, Eastern Little Stint or Little Stint (Higgins & Davies 1996). The Red-necked Stint is monotypic, meaning no subspecies are currently recognised (Higgins & Davies 1996).

Description
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The Red-necked Stint is a small Calidridinae approximately 13\009616 cm in length and is the smallest shorebird in Australia (Geering et al. 2007). It weighs 25 g and has a wingspan between 29 and 33 cm. The species is characterised by a small head, steep rounded

forehead, and long thickset body with an attenuated rear end. Other distinguishing features include short legs, a short, straight (or slightly decurved) bill with a slight bulbous or finely pointed tip. At rest the folded primaries reach slightly over the tip of the tail (rarely short of the tip). In flight all plumages show typical patterns of Stints, with white wing bars, white sides to a black centered rump and upper tail colours. The species has a variety of plumages depending on age, sex and time or year. Calls are important in identification. Sexes are similar, however, breeding adults are distinct from non-breeding adults as well as from juveniles (Higgins & Davies 1996).

Australian Distribution

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It is distributed along most of the Australian coastline with large densities on the Victorian and Tasmanian coasts. The Red-necked Stint has been recorded in all coastal regions, and found inland in all states when conditions are suitable. The Red-necked Stint probably travels in flocks and has been observed to feed in dense flocks. The Australian population was estimated at 353 000 (Watkins 1993). Sites of international importance and maximum or average counts (Watkins 1993) in Australia include: The Coorong, South Australia, 63 800 Eighty Mile Beach, Western Australia, 60 000 South East Gulf of Carpentaria, Queensland, 35 200 Penrice Saltfields, South Australia, 29 000 Port Hedland Saltworks, Western Australia, 23 000 Corner and Shallow Inlets, Victoria, 20 338 Roebuck Bay, Western Australia, 19 800 Wilson Inlet, Western Australia, 15 252 Werribee-Avalon, Victoria, 13 417 Alfred Cove Nature Reserve, Western Australia, 10 000 Altona, Victoria, 9536 Lake Macleod, Western Australia, 8312 Peel Inlet, Western Australia, 8063 Spencer Gulf, South Australia, 7600 Swan Bay - Mud Islands, Victoria, 7207 Lake George, South Australia, 5977 Westernport Bay, Victoria, 5783 Kangaroo Island, South Australia, 5600 Gippsland Lakes, Victoria, 5397 Anderson Inlet, Victoria, 5000 Price Saltfields, South Australia, 4832. A full count of Eighty Mile Beach in 1998 recorded 16 766 birds while in 2001, the the count yielded 24 005. Many thousands have been recorded in the Cooper Basin (C.D.T Minton 2002, pers. comm.). The Red-necked Stint is also regularly recorded in small numbers in New Zealand, and recorded from Norfolk Island, Lord Howe Island, Macquarie Island, and Auckland Island (Higgins & Davies 1996).

Global Distribution

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Breeding distribution

The Red-necked Stint breeds in Siberia and sporadically in north and west Alaska, probably from Taymyr region to Anadyr Territory and Koryakland. Though these limits are not well known, they are believed to include: the delta of the Lena River, Kresta Bay, the Chukotsky Peninsula, and the Anadyr Territory Koryakland; possibly around Ust-Yansk, Kurile Island and in Ussuriland; at Point Barrow and Seward Peninsula; possibly St Lawrence Island. (Higgins & Davies 1996). The Lena Delta appears to be a particularly important breeding area (C.D.T. Minton 2002, pers. comm.).

Migration

The Red-necked Stint is a common passage migrant through Japan, the Korean Peninsula, China, Taiwan, Hong Kong, Vietnam, Malaysia, the Philippines and West Micronesia. It spends winter in Australasia, mostly in Australia, with smaller numbers in New Guinea and New Zealand. Small numbers are known to spend winter in east India, the Gulf of Thailand, the Malay Peninsula and Indonesia. There are sporadic records on the Pacific coast of northern America and rare or accidental sightings in the British Isles, Germany, north-east United States of America, and islands of the south-west Pacific (Higgins & Davies 1996).

Population

The Australian population was estimated at 353 000 (Watkins 1993) and world population at 471 000 (Rose & Scott 1997). The latest estimate of world population may be as low as 315 000 (Delany & Scott 2002). Most recent reports indicate the following global distribution during the non-breeding season (Bamford et al. 2008):

Country	Estimate
Australia	260 000
Philippines	12 000
China	12 000
Indonesia	7000
Malaysia	6000
Papua New Guinea	4000
Thailand	4000
Vietnam	2000
other countries	2100
TOTALS:	309 100

During the non-breeding season, over 80% (260 000) of the global population resides in Australia. The population moves in and out of Australia's jurisdiction during breeding and non-breeding periods. All important migration sites during the non-breeding period are located in Australia. Important breeding sites occur exclusively in Russia and Alaska. Important migration sites for both north and south migrations occur in Australia, Indonesia, Malaysia, Thailand, South Korea, Russia and China (Bamford et al. 2008). Intertidal regions in east Asia, affected by human development, pose a serious threat to the Australian population (Milton 2003).

Surveys Conducted

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The Red-necked Stint has been reasonably well surveyed. A review by Bamford and colleagues (2008) examines all shorebirds that utilise the East Asian-Australasian Flyway. The review provides a comprehensive summary of the population dynamics of the Red-Necked Stint. Notable contributions to the review include Barter (1995), Barter and Harris (2002), Lane (1987), Skewes (2003), Rogers and Gosbell (2006) and Watkins (1993).

Population Information

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475 000 red-necked stints use the EAAF (Hansen et al. 2016). During the non-breeding season, over 80% (260 000) of the global population resides in Australia. The population moves in and out of Australia's jurisdiction during breeding and non-breeding periods. All important migration sites during the non-breeding

period are located in Australia. Important breeding sites occur exclusively in Russia and Alaska. Important migration sites for both north and south migrations occur in Australia, Indonesia, Malaysia, Thailand, South Korea, Russia and China (Bamford et al. 2008). Intertidal regions in east Asia, affected by human development, pose a serious threat to the Australian population (Milton 2003).

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During the 1980s, count data indicated high numbers of Red-necked Stints in Australia. There was a decline in the abundance of the species in Australia during the early 1990s due to poor breeding success (Watkins 1993) while more recent counts indicate an increasing population due to successful breeding (Rogers & Gosbell 2006).

Fluctuations in population numbers are typical of migratory birds. The population is lowest prior to breeding period and greatest just after breeding. There are no reported major fluctuations in population numbers (Bamford et al. 2008).

Land Tenure of Populations

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Ramsar wetlands used by the Red-necked Stint include:

- Eighty Mile Beach, Western Australia
- The Coorong, South Australia
- Eastern Port Phillip Bay, Victoria
- Corner Inlet, Victoria
- Roebuck Bay, Western Australia
- Gippsland Lakes and Western Port Bay, Victoria
- Logan Lagoon, Tasmania
- Derwent Estuary (Pittwater), Tasmania.

Habitat

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In Australasia, the Red-necked Stint is mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats. They sometimes use flooded paddocks or damp grasslands. They have occasionally been recorded on dry gibber plains, with little or no perennial vegetation (Higgins & Davies 1996).

Habitat for feeding

The Red-necked Stint mostly forages on bare wet mud on intertidal mudflats or sandflats, or in very shallow water; mostly in areas with a film of surface water and mostly close to edge of water. During high tides they sometimes forage in non-tidal wetlands. Red-necked Stints may also forage in samphire, generally avoid beds of seagrass, but may feed along edges. On Lake Reeve, Victoria, they have been reported to occasionally feed on algal mats. In south-east Tasmania they have been observed foraging on duckweed in a lagoon. In Westernport Bay, Victoria, they forage on beaches without mangroves. On Pelsaert Island, Western Australia, they have been recorded foraging on mud beneath mangroves. On sandy ocean beaches they sometimes forage in beachcast seaweed. They have been recorded foraging in flooded paddocks and in a freshly cropped lucerne paddock near lagoons (Higgins & Davies 1996).

Habitat for roosting

The Red-necked Stint roosts on sheltered beaches, spits, banks or islets, of sand, mud, coral or shingle, sometimes in saltmarsh or other vegetation. They occasionally roost on exposed reefs or shoals (Higgins & Davies 1996). Large numbers sometimes roost on ocean beaches, though it is probably not a preferred habitat and use of this habitat may increase when high numbers of birds are present (C.D.T. Minton 2002, pers. comm.). They were once recorded roosting c. 1.5 km from an inland lake, in close-cropped grass. They also roost among beachcast seaweed or clods of mud or dried cow-pats (Hobbs 1961). During very high tides they may use sand dunes or claypans. Large numbers (an estimated 7967 birds) were recorded roosting at an inland claypan near Roebuck Bay in north-west Western Australia (Collins et al. 2001).

Habitat needed for refuge from events such as fire, drought or flood

About a day after a cyclone had passed through Broome, lower than expected numbers (250 birds) were seen in Roebuck Bay. The birds presumably moved to sheltered areas to avoid the high winds and heavy rain (Collins et al. 2001).

Life Cycle

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The Red-necked Stint usually lays four eggs (sometimes three), and both parents incubate, for around 20 days. The female parent leaves soon after hatching but the male remains and usually tends the chicks for 16 days until they fledge. The Red-necked Stint probably breeds for the first time at two years of age, though first-year birds that remain in Australia during winter sometimes show traces of breeding plumage. It is estimated that the annual survival rate is up to 75% while individuals have been known to live over 18 years (C.D.T. Minton 2002, pers. comm.).

The Red-necked Stint does not breed in Australia (del Hoyo et al. 1996).

The Red-necked Stint nests at a density of up to 28 pairs/km², though more often at 4 pairs/km². They exhibit low nest site fidelity and nest in a shallow depression lined with leaves and grass (del Hoyo et al. 1996).

The Red-

necked Stint nests on the ground (del Hoyo et al. 1996) and is therefore vulnerable to predation. The Red-necked Stint breeds in Siberia and west Alaska, laying its eggs in June (del Hoyo et al. 1996).

Feeding

The Red-necked Stint is omnivorous. In Australia it is known to forage on intertidal and near-coastal wetlands. It jabs and probes with its bill into the soft mud for small invertebrates. It also gleans from plants in saltmarsh and water (Higgins & Davies 1996). The Red-necked Stint forages on plant seeds (such as from *Ruppia* spp. and *Polygonum* spp.) and on a range of marine worms, molluscs, snails and slugs, shrimps, spiders, beetles, flies and ants. The Red-necked Stint also eats grit (Higgins & Davies 1996). The Red-necked Stint sometimes feeds in dense flocks that spread out as the tide recedes. They often feed with other species, especially Sharp-tailed Sandpipers (*Calidris acuminata*) and Curlew Sandpipers (*Calidris ferruginea*) (Higgins & Davies 1996).

Movement Patterns

Migration patterns

The Red-necked Stint is migratory and breeds in Siberia and west Alaska and then moves to non-breeding areas south of c. 25° S in south-east Asia and Australasia (Higgins & Davies 1996).

Departure from breeding grounds

In the east Chukotski Peninsula, failed breeders may leave in June, females from mid-July, males by early August, and juveniles from mid-August. Birds from Alaska may pass through Aleutian and Pribilof Island to migrate south with the Siberian populations. Some Red-necked Stints may spend boreal winter in Americas. Some Siberian birds migrate overland, passing the Krasnoyarsk, Irkutsk and Buryatskaya regions from mid-July to September. In Russia they have been recorded as far west as Kazakhstan. Some cross Mongolia and Manchuria and may move across central China. Others move along the coast of east Asia with some crossing the Sea of Okhotsk. Some are known to move through Ussuriland from early August while many pass through Japan and Korea from August-October. In China they also pass through the north-east coast from mid-July to October and common south-east coasts from early September-early October. Many pass through the south of Taiwan from early August to mid-October and also Hong Kong from August-November. They are also known to pass through Burma, Vietnam, Thailand, Peninsular Malaysia, Singapore, Philippines, Borneo, Wallacea, West Micronesia and Indonesia. They are a common passage migrant in New Guinea from early August-December (Higgins & Davies 1996).

Arrival in Australia

The Red-necked Stint arrives in Australia from August (and possibly July), with most from early September. Some Red-necked Stints are known to pass through the Torres Strait. In north Australia, adults start arriving from the third week of August and most arrive before the end of September. Juveniles begin to arrive in late September and early October, and most arrive by early November. Arrival times in southern Australia are only a couple of weeks later (C.D.T. Minton 2002, pers. comm.). From north-west Australia, some move to south-west Australia, possibly moving along the west coast. From August-December others cross the continent towards the south, south-east and east coasts. During the same time period (although mostly in September) some pass through Gulf St Vincent, South Australia (Higgins & Davies 1996).

Non-breeding

In south-east Australia, many Red-necked Stints occur on inland wetlands during October and November, moving to marine embayments by December. In north-east Queensland, numbers fluctuate erratically during December and January, with most leaving northern sites by the end of February. Numbers at marine embayments in south and south-eastern Australia are stable from December until early March or April. Once established at non-breeding sites in south-east Australia, most move about the local area. First-year birds seem to move around more than adults. Some movements appear dispersive, for example some Red-necked Stints have been observed to leave wetlands affected by drought and move to recently filled ephemeral wetlands. Birds in some non-coastal wetlands in north Australia apparently leave before or at onset of wet season (Higgins & Davies 1996).

Return to breeding grounds

The Red-necked Stint leaves Australia from late February or March through to April. A few, however, may remain until May (Higgins & Davies 1996). Generally, in both north and south Australia, north migration does not commence until the last week of March, with most birds leaving in April (C.D.T. Minton 2002, pers. comm.). The Red-necked Stint is thought to be able to fly from Tasmania to north-west Australia non-stop, though large numbers sometimes pass through South Australia in February or March. Most birds from south-east Australia appear to migrate across the continent, but some move up the east coast (Higgins & Davies 1996). Birds in Victoria gain enough weight to fly to north Australia non-stop, or even directly to Indonesia (Rogers et al. 1996). From north-west Australia, most are thought to fly non-stop to Vietnam or south China, then proceed inland direct to breeding grounds. Large numbers have been recorded in the Daursky marshes area, and large flocks have been seen moving through Mongolia late May-early June (C.D.T. Minton 2002, pers. comm.). Most birds leave New Zealand from March-April. Many pass through New Guinea from March-April. The birds are more common on the west coast of Peninsular Malaysia on north migration, but also on the smaller passage through Brunei, where the greatest numbers occur from January-late May. They have been recorded in Wallacea from April-June. They then pass Olango Island in the Philippines from February-April (mostly in

March). More pass through Hong Kong on north migration than south migration from late March to late May, with most from mid-April to mid-May. They pass through south Taiwan from late April to mid-May and move through the Chinese coast and both coasts of Korea from April-May. They are also common in Japan. They cross Ussuriland in late May and early June and arrive at nesting grounds from June (Higgins & Davies 1996).

Breeding Many first-year birds winter in both south and north Australia. Some may move north during winter (e.g. from Tasmania to mainland) or move inland. They also winter in New Zealand (Higgins & Davies 1996).

Migratory pathways and important sites Key staging areas are the Chinese coast on north migration and Japan on south migration. The Yellow Sea supports about 30% of the population during north migration (Higgins & Davies 1996). Migration occurs through Transbaikalia (Russia) and adjacent regions of Mongolia, and there are important staging areas on Lake Baikal and in the Torey Depression (Goroshko 1999).

Survey Guidelines Top

This species is fairly similar to the Little Stint, *Calidris minuta*, in all plumages, but the Little Stint is very uncommon in Australia. It is sometimes confused with the Sanderling, *C. alba*, which has superficially similar breeding and non-breeding plumages. The Sanderling is larger, with a slightly longer, heavier bill and longer legs, and can be distinguished by its lack of hindtoe (Higgins & Davies 1996).

There is a distinct difference between breeding and non-breeding adults and juveniles. Breeding adults In breeding adults the head, neck and centre of upper breast are light rufous with coarse black streaks on the centre of the forehead and crown. They also have finer streaks on the nape and hind neck with a diffuse dusty loreal stripe broadening in front of eye. In very fresh plumage, all the feathers on the head and neck have narrow whitish tips. The underbody is white to the rump. The uppertail coverts have a black line through the centre with a pale-grey tail. The legs and feet are black. The mantle appears coarsely streaked black and rufous with usually distinct broad yellow or cream lines along sides (not forming a complete V). The lower breasts to undertail coverts are white with black streaks restricted to the neck lace and encircling the lower breast and fore flanks (Higgins & Davies 1996).

Adult non-breeding The centre of the forehead, crown, nape, hindneck, and sides of the malor area are white. There is also a prominent white supercilium from the hill to above the rear eye coverts. They have are brownish-grey ear coverts, finely streaked and sparkled dark along lower edge that merges into the white of lower face. The underbody is white with diffuse grey-brownish patches at the sides of the foreneck and upper breast (Higgins & Davies 1996).

Juveniles The major features of juveniles include a large variation of the rufous tones and dark feather centres on upperparts. In some birds they are bright while in others they are colourless and grey. A dark loreal stripe and whitish sides to the forehead stand out as the most prominent feature. The supercilium is dull and white often forming over the bill to form a dull forehead. A narrow dark loreal stripe broadens in the front of the eye. This sometimes combines with the brownish grey and finely streaked upper ear coverts to form a dark eye stripe. The centre of the forehead and crown is light rufous-brown with coarse black streaks forming the central ridge, with paler more finely streaked sides of the crown (Higgins & Davies 1996).

Threats Top

Global threats There are a number of threats that affect migratory shorebirds in the East Asian-Australasian Flyway. The greatest threat is indirect and direct habitat loss (Melville 1997). Staging areas used during migration through eastern Asia are being lost and degraded by activities which are reclaiming the mudflats for development or developing them for aquaculture (Barter 2002, 2005c; Ge et al. 2007; Round 2006). This is especially evident in the Yellow Sea, where at least 40% of intertidal areas have been reclaimed. This process is continuing at a rapid rate and may accelerate in the near future (Barter 2002, 2005c). For example, in South Korea, the Mangyeong and Dongjin River estuaries each supported 5% of the combined estimated Flyway populations (and are the most important sites for this species on both northern and southern migration) but they are currently being reclaimed as part of the Saemangeum Reclamation Project (Barter 2002, 2005c). The 33 km sea-wall across these two estuaries was completed in April 2006, resulting in significant change in the 40 100 ha area.

Reclamation is also a threat in other areas of the Flyway, such as in Malaysia (Wei et al. 2006). In addition, water regulation and diversion infrastructure in the major tributaries have resulted in the reduction of water and sediment flows (Barter 2002; Barter et al. 1998).

Migratory shorebirds are also adversely affected by pollution, both on passage and in non-breeding areas (Harding et al. 2007; Melville 1997; Round 2006; Wei et al. 2006).

Disturbance from human activities, including recreation, shellfish harvesting, fishing and aquaculture is likely to increase significantly in the future (Barter et al. 2005c; Davidson & Rothwell 1993).

It is predicted that the rate of decrease in the intertidal area in the Yellow Sea will accelerate (Barter 2002). In addition, intensive oil exploration and extraction, and reduction in river flows due to upstream water diversion, are other potentially significant threats in parts of China where this species is present in internationally significant numbers (Barter 2005c; Barter et al. 1998).

Global warming and associated changes in sea level are likely to have a long-term

impact on the breeding, staging and non-breeding grounds of migratory waders (Harding et al. 2007). Hunting is still a very serious problem for waders in China, and this species is sometimes caught (Ming et al. 1998).

Threats within Australia

Within Australia, there are a number of threats common to most migratory shorebirds, including the Red-necked Stint. Habitat loss

The loss of important habitat reduces the availability of foraging and roosting sites. This affects the ability of the birds to build up the energy stores required for successful migration and breeding. Some sites are important all year round for juveniles who may stay in Australia throughout the breeding season until they reach maturity. A variety of activities may cause habitat loss. These include direct losses through land clearing, inundation, infilling or draining. Indirect loss may occur due to changes in water quality, hydrology or structural changes near roosting sites (DEWHA 2009aj).

Habitat degradation

As most migratory shorebirds have specialized feeding techniques, they are particularly susceptible to slight changes in prey sources and foraging environments. Activities that cause habitat degradation (DEWHA 2009aj) include, but are not restricted to:

- loss of marine or estuarine vegetation, which is likely to alter the dynamic equilibrium of sediment banks and mudflats
- invasion of intertidal mudflats by weeds such as cord grass
- water pollution and changes to the water regime
- changes to the hydrological regime
- exposure of acid sulphate soils, hence changing the chemical balance at the site.

Disturbance

Disturbance can result from residential and recreational activities including; fishing, power boating, four wheel driving, walking dogs, noise and night lighting. While some disturbances may have only a low impact it is important to consider the combined effect of disturbances with other threats. Roosting and foraging birds are sensitive to discrete, unpredictable disturbances such as loud noises (i.e. construction sites) and approaching objects (i.e. boats). Sustained disturbances can prevent shorebirds from using parts of the habitat (DEWHA 2009aj).

Direct mortality

Direct mortality is a result of human activities around the migration pathways of shorebirds and at roosting and foraging sites. Examples include the construction of wind farms in migration or movement pathways, bird strike due to aircraft, hunting, chemical and oil spills (DEWHA 2009aj).

Threat Abatement and Recovery

Top Governments and conservation groups have undertaken a wide range of activities relating to migratory shorebird conservation (AGDEH 2005c) both in Australia and in cooperation with other countries associated with the East Asian-Australasian Flyway.

Australia

The Wildlife Conservation Plan for Migratory Shorebirds (AGDEH 2006f) outlines national activities to support flyway shorebird conservation initiatives and provides a strategic framework to ensure these activities and future research and management actions are integrated and remain focused on the long-term survival of migratory shorebird populations and their habitats.

Since 1996, the Australian Government has invested approximately \$5 000 000 of Natural Heritage Trust (NHT) funding in projects contributing to migratory shorebird conservation (DEWHA 2007e). This funding has been distributed across a range of important projects, including the implementation of a nationally coordinated monitoring programme that will produce robust, long-term population data able to support the conservation and effective management of shorebirds and their habitat; migration studies using colour bands and leg flags; and development of a shorebird conservation toolkit to assist users to develop and implement shorebird conservation projects.

Birds Australia is currently co-ordinating the Shorebirds 2020 project, which aims to monitor shorebird populations at important sites throughout Australia; and Birdlife International is identifying sites and regions which are important to various species of birds, including shorebirds, and the processes that are affecting them. The aim is to inform decisions on the management of shorebird habitat. It may be possible to rehabilitate some degraded wetlands or to create artificial wader feeding or roosting sites to replace those destroyed by development, such as by creating artificial sandflats and sand islands from dredge spoil and by building breakwaters (Dening 2005; Straw 1992a, 1999).

The Significant impact guidelines for 36 migratory shorebirds Draft EPBC Act Policy Statement 3.21 (DEWHA 2009aj) provides guidelines for determining the impacts of proposed actions on migratory shorebirds. The policy statement also provides mitigation strategies to reduce the level and extent of those impacts.

International

Australia has played an important role in building international cooperation to conserve migratory birds. In addition to being party to international agreements on migratory species, Australia is also a member of the Partnership for the Conservation of Migratory Waterbirds and the Sustainable Use of their Habitats in the East Asian-Australasian Flyway (Flyway Partnership), which was launched in Bogor, Indonesia on 6 November 2006. Prior to this agreement, Australia was party to the Asia-Pacific Migratory Waterbird Conservation Strategy and the Action Plan for the Conservation of Migratory Shorebirds in the East Asian-Australasian Flyway and the East Asian-Australasian Shorebird Site Network.

The East Asian-Australasian Flyway Site Network, which is part of the broader Flyway Partnership, promotes the identification and protection of key sites for migratory shorebirds. Australia has 17 sites in the network (Partnership EAAF 2008): Kakadu National Park, Northern Territory (1 375 940 ha) Parry Lagoons, Western Australia (36 111 ha) Thomsons Lake, Western

Australia (213 ha)\nMoreton Bay, Queensland (113 314 ha)\nHunter Estuary, NSW (2916 ha)\nCorner Inlet, Victoria (51 500 ha)\nThe Coorong, Lake Alexandrina & Lake Albert, South Australia (140 500 ha)\nOrielton Lagoon, Tasmania (2920 ha)\nLogan Lagoon, Tasmania (2320 ha)\nWestern Port, Victoria (59 297 ha)\nPort Phillip Bay (Western Shoreline) and Bellarine Peninsula, Victoria (16 540 ha)\nShallow Inlet Marine and Coastal Park, Victoria\nDiscovery Bay Coastal Park, Victoria\nBowling Green Bay, Queensland\nShoalwater Bay, Queensland\nGreat Sandy Strait, Queensland\nCurrawinya National Park, Queensland.

Mitigation Approach

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There have been no mitigation measures developed specifically for this species. However the Significant impact guidelines for 36 migratory shorebirds Draft EPBC Act Policy Statement 3.21 (DEWHA 2009aj) provide guidelines for mitigation strategies for migratory shorebirds in general.

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 Red-necked Stint has been identified as a conservation value in the North-west (DSEWPaC 2012y) Marine Region. See Schedule 2 of the North-west Marine Bioregional Plan (DSEWPaC 2012y) for regional advice. Maps of Biologically Important Areas have been developed for Red-necked Stint 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 & migratory shorebirds" for the North-west (DSEWPaC 2012y) Marine Region provides additional information.

Major Studies

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There have been several studies on the Red-necked Stint, references for which are captured in Bamford and colleagues (2008). There is a detailed summary in Marchant and Higgins (1993), and international summaries in Cramp and Simmons (1983) and Wiersma (1996). There are also general discussions and summaries of the ecology, conservation and threats of this species and other shorebirds in Geering and colleagues (2007), Barter (2002) and Watkins (1993).

Management Documentation

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The Department's Wildlife Conservation Plan for Migratory Shorebirds (AGDEH 2006f), the Background Paper to the Wildlife Conservation Plan for Migratory Shorebirds (AGDEH 2005c) and The Action Plan for Australian Birds (Garnett & Crowley 2000) also contain actions aimed at the conservation of migratory birds within Australia.

The Significant impact guidelines for 36 migratory shorebirds Draft EPBC Act Policy Statement 3.21 (DEWHA 2009aj) provides guidelines for determining the impacts of proposed actions on migratory shorebirds. The policy statement also provides mitigation strategies to reduce the level and extent of those impacts.

Species Profile References

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