The Minister approved this conservation advice and included this species in the Endangered category, effective from 5 May 2016

Conservation Advice

Charadrius mongolus

Lesser sand plover

Taxonomy

Conventionally accepted as *Charadrius mongolus* Pallas, 1776. Charadriidae.

Other common names include Mongolian plover, dotterel, sand-plover or sand-dotterel; lesser dotterel or sand-dotterel; short-nosed sand plover (Marchant & Higgins 1993).

Two subspecies occur in Australia, *Charadrius mongolus mongolus* lesser sand plover (Mongolian) and *C. m. stegmanni* lesser sand plover (Kamchatkan). Taxonomic uniqueness: medium (11 genera/family, 35 species/genus, 5 subspecies/species; Garnett et al., 2011).

Summary of assessment

Conservation status

Endangered: Criterion 1 A2 (a)

The highest category for which *Charadrius mongolus* is eligible to be listed is Endangered.

Charadrius mongolus has been found to be eligible for listing under the following listing categories:
Criterion 1: A2 (a): Endangered
Criterion 2: Not eligible
Criterion 3: Not eligible
Criterion 4: Not eligible
Criterion 5: Not eligible

Species can be listed as threatened under state and territory legislation. For information on the listing status of this species under relevant state or territory legislation, see http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Reason for conservation assessment by the Threatened Species Scientific Committee

This advice follows assessment of new information provided to the Committee to list *Charadrius mongolus*.

Public Consultation

Notice of the proposed amendment and a consultation document was made available for public comment for 47 business days between 1 October and 4 December 2015. Any comments received that were relevant to the survival of the species were considered by the Committee as part of the assessment process.

Species/Sub-species Information

Description

The lesser sand plover is a small to medium-sized (18 - 21 cm in length and 56 - 71 g in body mass) grey-brown and white shorebird. It has a dark eye-stripe, short stout black bill and short grey legs (Marchant & Higgins 1993; Ward 2012).

Sexes differ when in breeding plumage, but are inseparable when in non-breeding plumage. In non-breeding plumage, the head, nape and upperparts are dark brown-grey and there are large brown-grey patches on the sides of the breast. The cheeks are dark brown and the forehead, eyebrow, chin, neck and underparts are white (Marchant & Higgins 1993; Ward 2012).

Males in breeding plumage have a broad chestnut breast-band with a black upper margin, a chestnut forehead and nape, and a broad black mask on the face (Marchant & Higgins 1993; Ward 2012). The female is similar except the mask is dark grey-brown or rufous and the crown, hindneck, sides of the neck and the breast-band are duller chestnut (Marchant & Higgins 1993).

Juvenile birds are similar to adults in non-breeding plumage but have buff fringes to their feathers and the breast-band is indistinct (Marchant & Higgins 1993).

When in Australia the species is usually in non-breeding plumage and is often difficult to distinguish from the similar greater sand plover *C. leschenaultii* although the lesser sand plover is distinctly smaller (Marchant & Higgins 1993).

Distribution

Australian distribution

The lesser sand plover breeds in the northern hemisphere and undertakes annual migrations to and from southern feeding grounds for the austral summer. Four of the five subspecies occur in the East Asian-Australasian Flyway, EAAF (Bamford et al. 2008). Two of these EAAF subspecies, *C. m. mongolus* and *C. m. stegmanni*, occur in Australia during the non-breeding season (Bamford et al. 2008).

Within Australia, the lesser sand plover is widespread in coastal regions and has been recorded in all states. It mainly occurs in northern and eastern Australia, in south-eastern parts of the Gulf of Carpentaria, western Cape York Peninsula, islands in Torres Strait, and along the entire east coast. It is most numerous in Queensland and New South Wales (Marchant & Higgins 1993; Watkins 1993; Milton & Driscoll 2006; Minton et al. 2006). In the Northern Territory, lesser sand plovers have been recorded from most of the coastline with the most significant areas being the coast from Anson Bay to Murgenella Creek, the northern Arnhem coast, Blue Mud Bay and the Port McArthur area (Chatto 2003; Ward 2012). The species has also been recorded on Lord Howe Island, Norfolk Island and Christmas Island (Marchant & Higgins 1993).

Global distribution

The lesser sand plover has an extremely large global range with the extent of occurrence estimated to be 3,620,000 km^2 (BirdLife International 2015).

East Asian-Australasian Flyway (EAAF)

The lesser sand plover is one of 36 migratory shorebird species that breed in the northern hemisphere during the boreal summer and are known to annually migrate to the non-breeding grounds of Australia along the EAAF for the austral summer. In general, the EAAF stretches from breeding grounds in the Russian tundra, Mongolia and Alaska southwards through east and south-east Asia, to non-breeding areas in Indonesia, Papua New Guinea, Australia and New Zealand (Department of the Environment 2015a,b).

With the exception of *C. m. pamirensis* that breeds in central Siberia and migrates to southern Asia and eastern Africa, the remaining four subspecies of the lesser sand plover all occur in the EAAF and two of these occur in Australia during the non-breeding period (Table 1; distribution information from Marchant & Higgins 1993; Tomkovich 2003; Bamford et al. 2008; Gill & Donsker 2015).

Table 1: Breeding and non-breeding distribution of subspecies of the lesser sand plover that occur in the East Asian-Australasian Flyway (EAAF).

EAAF subspecies	Breeding distribution	Non-breeding distribution
C. m. mongolus	Inland eastern Siberia, including the Russian Far East, and Mongolia.	China, Philippines, Indonesia, Papua New Guinea and Australia. This is the most common subspecies observed in Australia (Bamford et al. 2008).
C. m. stegmanni	Russia, especially around Kamchatka, on the northern Kuril and Commander Islands and on the Chukotka Peninsula.	Tends to be more northerly than that of *C. m. mongolus* and includes China, Japan, the Philippines, eastern Indonesia, Melanesia and Australia.
C. m. atrifrons	Himalayas and southern Tibet.	Includes sites around the Bay of Bengal, Malaysia, Thailand and western Indonesia.
C. m. schaeferi	Southern Mongolia to eastern Tibet and adjacent provinces of China.	Malaysia, Thailand and western Indonesia.

Relevant Biology/Ecology

Life history

A generation time of 8 years (BirdLife International 2015) is derived from an average age at first breeding of 2 years, an annual adult survival of 56% and a maximum longevity of 12.6 years, all extrapolated from *C. leschenaultii.*

Breeding

The lesser sand plover does not breed in Australia.

This species nests in the northern hemisphere during the boreal summer with egg laying occurring between mid-May and mid-June. Clutch size is typically three eggs, but occasionally two, and incubation lasts for 22–24 days. Chicks are usually tended by the male, but sometimes by both parents, and fledge at about 30–35 days old (Wiersma 1996).

General habitat

At northern breeding grounds, the lesser sand plover's nest is a shallow scrape in bare sand or shingle, sometimes beside bushes and big stones (del Hoyo et al. 1996; BirdLife International 2015).The breeding grounds are at high elevations (up to 5,500 m), above the tree-line, in tundra on steppes and in flat, barren valleys and basins, usually in boggy areas. In Siberia and the Commander Islands, Russia, the species also occurs at sea-level and breeds in the sand dunes and shingle along the coast (Marchant & Higgins 1993; del Hoyo et al. 1996).

During the non-breeding season, the species is almost strictly coastal, preferring sandy beaches, mudflats of coastal bays and estuaries, sand-flats and dunes near the coast (del Hoyo et al. 1996) and occasionally frequenting mangrove mudflats in Australia (BirdLife International 2015).

The lesser sand plover is gregarious and usually occurs in small to large flocks often with more than 100 individuals at favoured sites in northern Australia (Department of the Environment

2015a,b). This species often occurs with other shorebird species when feeding especially the greater sand plover although the two species usually remain segregated when roosting (Marchant & Higgins 1993). The species is mainly diurnal but may forage on moonlit nights (del Hoyo et al. 1996; BirdLife International 2015).

Feeding habitat

The lesser sand plover mainly feeds on extensive, freshly-exposed areas of intertidal sandflats and mudflats in estuaries or beaches, or in shallow ponds in saltworks. They also occasionally forage on coral reefs and on sandy or muddy river margins and, at inland sites, they have been recorded foraging in muddy areas around lakes, soaks and bores (Marchant & Higgins 1993).

Roosting habitat

The lesser sand plover roosts near foraging areas, on beaches, banks, spits and banks of sand or shells and occasionally on rocky spits, islets or reefs (Marchant & Higgins 1993).

Diet

The breeding diet of the lesser sand plover includes beetles, weevils, fly larvae, stalk worms and crabs (del Hoyo et al. 1996). During the non-breeding season, the diet includes insects, crustaceans (especially crabs and amphipods), molluscs (especially bivalves) and polycheate worms (Marchant and Higgins 1993; Garnett et al. 2011; BirdLife International 2015).

Prey is located by sight, using the typical run-stop-peck method used by most *Charadrius* plovers. The lesser sand plover gleans the surface of moist substrates or probes or digs just below the surface for prey (Marchant & Higgins 1993).

Migration patterns

The lesser sand plover is a shorebird that breeds in the northern hemisphere and migrates south for the boreal winter. The five different subspecies have different breeding and non-breeding ranges, although the non-breeding ranges of subspecies *C. m. mongolus* and *C. m. stegmanni* overlap in southern China, Philippines, Thailand, Malaysia, western Indonesia and northern Australia (Marchant & Higgins 1993).

Departure from breeding grounds

Populations breeding in eastern Russia, Kamchatka, the Commander Islands and the Chukotka Peninsula (i.e. *C. m. stegmanni*) leave the breeding grounds from late-July to early-September to spend the non-breeding period from Taiwan to Australia (del Hoyo et al. 1996; BirdLife International 2015). Females leave from late July (though mostly in August and early September) and juveniles leave in the first two or three weeks of September (Wiersma 1996). The timing of departure from the breeding grounds by the subspecies *C. m. mongolus* is unknown, but is probably similar to that of *C. m. stegmanni* (Marchant & Higgins 1993).

Non-breeding season

The species is present at non-breeding grounds in Australasia mostly between September and April or May, with greatest numbers occurring in northern Australia (Marchant & Higgins 1993). Birds generally arrive in Australia between August and October and start moving along the northern and eastern coasts until October or November. Maximum numbers occur at most sites by December and remain fairly constant until late February. In southern Australia, numbers usually increase gradually between August and December. Numbers begin to increase at various sites in northern Australia between February and April (mostly March to April), suggesting that birds move along the eastern and northern coasts before they leave on their

northern migration in April (Marchant & Higgins 1993). Some non-breeding individuals (most likely one-year-old birds) may stay at southern non-breeding sites during the austral winter (del Hoyo et al. 1996; BirdLife International 2015).

Apart from arrivals and departures before northern migration, numbers of lesser sand plovers remain fairly constant at many sites from mid-November to late February. However, fluctuations in numbers in some areas (e.g. sites in northern Queensland) suggest that local movements take place (Marchant & Higgins 1993).

Return to breeding grounds

Northward and southward migration are reported to follow similar routes through eastern Russia, the Yellow Sea, along the east coast and overland through China, and through Japan (northward migration only) and the Philippines. The distribution of important sites in the two migration periods was similar except for there being more sites in China and Japan during northward migration. There may be additional significant sites in North Korea (Bamford et al. 2008).

Description of migratory pathways and important sites

The Yellow Sea is a very important region for the migration of the lesser sand plover. It is estimated that 50% of the lesser sand plovers in the EAAF utilise the Yellow Sea area on northward migration (Barter 2002; Garnett et al. 2011). In this region, sites in the Republic of Korea and China are of international importance as well as some areas in the inner Gulf of Thailand (Barter 2002; Bamford et al. 2008). Bamford et al. (2008) provide maps of the northward and southward key migration sites.

It is thought that it may be possible for *C. m. mongolus* moving to and from Australia to overfly much of south-eastern Asia (Bamford et al. 2008) as theoretical flight ranges of 2,600 – 4,400 km have been proposed (Barter 1991 cited in Bamford et al. 2008).

High counts in Malaysia and Thailand during both migration periods may be of the subspecies *C. m. schaeferi* (Bamford et al. 2008). On northward migration *C. m. mongolus* (northern breeding range) have been reported from Hong Kong (China) and *C. m. stegmanni* (north-eastern breeding range) have been reported from the Korean Peninsula (Marchant & Higgins 1993; Bamford et al. 2008).

Threats

Migratory shorebirds, such as the lesser sand plover, are sensitive to certain development activities due to their high site fidelity, tendency to aggregate, very high energy demands required for migration, and need for habitat networks containing both roosting and foraging sites (Department of the Environment 2015a,b).

Threats to the global population of the lesser sand plover across its range, but particularly at East Asian staging sites, include: habitat loss and habitat degradation (e.g. through land reclamation, industrial use and urban expansion; reduced river flows; environmental pollution; invasive plants); pollution/contamination impacts; disturbance; direct mortality (e.g. hunting); diseases; and, climate change impacts (Melville 1997; Garnett et al. 2011; BirdLife International 2015; Department of the Environment 2015a,b).

Threats to the lesser sand plover in Australia, especially eastern and southern Australia, include ongoing human disturbance, habitat loss and degradation from pollution, changes to the water regime and invasive plants (Garnett et al. 2011; Department of the Environment 2015a,b).

Habitat loss and habitat degradation

There are a number of threats that affect migratory shorebirds in the EAAF with the greatest threat being indirect and direct habitat loss (Melville 1997). As most migratory shorebirds have specialised feeding techniques, they are particularly susceptible to slight changes in prey

sources and foraging environments. Activities that cause habitat degradation 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 cordgrass; water pollution and changes to the water regime; changes to the hydrological regime and exposure of acid sulphate soils, hence changing the chemical balance at the site (Department of the Environment 2015a,b).

Migration staging areas through eastern Asia are being lost and degraded by activities which are reclaiming intertidal mudflats for development or converting them for the aquaculture industry (Barter 2002; Ge et al. 2007; Moores et al. 2008; MacKinnon et al. 2012; Murray et al. 2014). This is especially evident in the Yellow Sea region where 28% of Yellow Sea tidal flats that existed in the 1980s had disappeared by the late 2000s (rate of 1.2% per year; Murray et al. 2014). Furthermore, reference to historical maps suggests that up to 65% of tidal flats in the Yellow Sea region have been lost since the 1960s (Murray et al. 2014). It is predicted that the rate of decrease in the intertidal area in the Yellow Sea will continue (Barter 2002).

In the Korean area of the Yellow Sea, the Mangyeung and Dongjin River estuaries, which were important staging areas for the lesser sand plover on both northern and southern migration, have been reclaimed as part of the Saemangeum Reclamation Project (Barter 2002). One of the largest reclamation projects in the world, this project has converted the two free-flowing estuaries and 40,100 ha of tidal-flats and sea shallows into a vast reservoir and surrounding land through the construction of a 33-km long seawall (Barter 2002; Moores et al. 2008; Murray et al. 2014).

Between 1994 and 2010, the reclamation of large areas (including intertidal mudflats) in Bohai Bay (Yellow Sea, China) for two industrial projects caused migrating shorebirds, including the lesser sand plover, to become concentrated in an ever smaller remaining area. With the proposed continuation of land reclamation in Bohai Bay, it has been predicted that shorebird densities in the remaining areas will increase to a point of collapse (Yang et al. 2011).

At Chongming Island in China, a site of international importance for the lesser sand plover (Ma et al. 2002), there is ongoing and significant habitat loss and degradation through conversion to aquaculture ponds, farmlands and vegetable gardens, the cultivation of the alien plant *Spartina alterniflora* on tidal flats (promoting rapid sedimentation with the intention of reclaiming the area), and the Three Gorges Dam on the upper reaches of the Yangtze River reducing the supply of river-borne sediment to mudflats in the area (Ma et al. 2002; BirdLife International 2015).

At study sites on the Shanghai shoreline (China), the lesser sand plover was one of the most common species in the 1984–85 boreal summer counts and in the 2004-05 summer counts although there appeared to be decreases in numbers in the spring and autumn counts between 1984-85 and 2004-05 (Ge et al. 2007). More than half of all Chinese coastal wetlands were lost between 1950 and 2000 (An et al. 2007) and, since the 1980s, over 500 km^2 of intertidal mudflats along the Shanghai shoreline have been reclaimed (Ge et al. 2007). 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 the lesser sand plover is present in internationally significant numbers (Barter et al. 1998; Barter 2005).

In Australia, there are a number of threats common to most migratory shorebirds, including the lesser sand plover. 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 at Australian sites. 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 (Department of the Environment 2015a,b).

Residential, farming, industrial and aquaculture/fishing activities represent the major cause of habitat loss or modification in Australia (Department of the Environment 2015a,b). The non-breeding grounds of the species in south-eastern Australia are threatened by habitat degradation, loss and human disturbance (Garnett et al. 2011) whereas sites in the Northern Territory are thought to be generally free of such disturbances (Ward 2012).

Climate change

Climate change projections for Australia include the likelihood of increased temperatures and rising sea levels with more frequent and/or intense extreme climate events which may result in species loss and habitat degradation (Chambers et al. 2005). 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 shorebirds (Harding et al. 2007).

In tropical areas, migratory shorebirds may be particularly susceptible to heat stress for a range of reasons including the need to store increased levels of fat prior to migration (Battley et al. 2003; Rogers et al. 2006).

Any sea level rise will greatly alter coastal ecosystems, causing habitat change and loss for shorebird species. Modelling has shown that migratory species in the EAAF are at greater risk from sea level rise than previously thought (Iwamura et al. 2013). The modelling indicated that the effect of sea level rise inundating 23–40% of intertidal habitat areas along the migration routes of migratory shorebirds would cause a reduction in population flow (i.e. maximum flow capacity of the migratory population) of up to 72% across the shorebird species assessed. This magnification of effect was particularly due to shorebirds using a few key sites in the EAAF where a large proportion of the population stops and stages (Iwamura et al. 2013).

Rises in sea level could impact on the lesser sand plover due to loss of intertidal and coastal habitat. Taking into account up-shore movements of intertidal habitat, modelling indicated that, for this species, population flow could reduce by 5% with a 150 cm sea level rise (Iwamura et al. 2013).

Pollution/contamination impacts

Migratory shorebirds are also adversely affected by pollution, both on passage and in non-breeding areas (Melville 1997; Harding et al. 2007). Industrial pollution (e.g. via accidental release) can lead to the build-up of heavy metals or toxic elements in the substrate of wetlands which, in turn, can affect the benthic prey fauna of shorebirds like the lesser sand plover (Department of the Environment 2015a,b).

Disturbance

Human disturbance can cause shorebirds to interrupt their feeding or roosting and may influence the area of otherwise suitable feeding or roosting habitat that is actually used. Disturbance from human recreation activities may force migratory shorebirds to increase the time devoted to vigilance and anti-predator behaviour and/or may compel the birds to move to alternative, less favourable feeding areas (Goss-Custard et al. 2006; Glover et al., 2011; Weston et al., 2012).

Disturbance can result from recreational activities including fishing, boating, four-wheel driving, walking dogs, noise and night lighting. While some disturbances may have a low impact, it is important to consider the combined effect of disturbances with other threats (Department of the Environment 2015a,b).

With increasing tourist visitation and development along the Queensland coast and around Broome, Western Australia, increasing levels of disturbance from human recreational activity are likely for the migratory shorebirds in this area. Recreational fishing, four-wheel driving, unleashed dogs and jet-skiing may disturb the foraging or roosting behaviour of migratory shorebirds. Migratory shorebirds are most susceptible to disturbance during daytime roosting and foraging periods (Department of the Environment 2015a,b).

Introduced species

Introduced plants, such as cord grass *Spartinia*, can invade intertidal mudflats and reduce the amount of suitable foraging areas, as has already occurred in other countries (Goss-Custard & Moser 1988). Exotic marine pests may also result in the loss of benthic food sources (Department of the Environment 2015a,b).

Direct mortality

Direct mortality may result from collision with large structures (e.g. wind farms) which cause a barrier to migration or movement pathways, bird strike with vehicles and aircraft, hunting, chemical spills, oil spills and predation (attack by domestic pets, hunting by humans; Schlacher et al., 2013; Department of the Environment 2015a,b) .

The lesser sand plover may still be subject to commercial hunting (for sale at market or to restaurants) which is a major threat in areas like Chongming Island, China (Ma et al. 2002). Records between 1985 and 2009 indicate that at least 869 individuals of this species were hunted in China, Thailand, and Myanmar alone. Within this period, taking into account the year with lowest take (lower bound) and the year with highest take (upper bound), the possible range of annual take is at least 423 to 737 individuals (Ruttanadakul and Ardseungnerm 1986, Tang and Wang 1995, Ming et al 1998, Zöckler et al. 2010).

The lesser sand plover is vulnerable to predation by foxes on breeding grounds as they nest on the ground and the chicks are very precocial (Wiersma 1996).

Disease

Since, 1992, the viral disease testing of Charadriiformes from coastal northwest Australia has not detected any evidence of avian influenza virus excretion in the lesser sand plover or any other shorebird species tested. However, for a number of shorebirds species, there was evidence of a very low level of past exposure to the virus from serologic testing (Curran et al. 2014).

How judged by the Committee in relation to the EPBC Act Criteria and Regulations

Criterion 1. Population size reduction (reduction in total numbers)
Population reduction (measured over the longer of 10 years or 3 generations) based on any of A1 to A4

	Critically Endangered Very severe reduction	Endangered Severe reduction	Vulnerable Substantial reduction
A1	**≥ 90%**	**≥ 70%**	**≥ 50%**
A2, A3, A4	**≥ 80%**	**≥ 50%**	**≥ 30%**

A1 Population reduction observed, estimated, inferred or suspected in the past and the causes of the reduction are clearly reversible AND understood AND ceased.

A2 Population reduction observed, estimated, inferred or suspected in the past where the causes of the reduction may not have ceased OR may not be understood OR may not be reversible.

A3 Population reduction, projected or suspected to be met in the future (up to a maximum of 100 years) [(*a) cannot be used for A3*]

A4 An observed, estimated, inferred, projected or suspected population reduction where the time period must include both the past and the future (up to a max. of 100 years in future), and where the causes of reduction may not have ceased OR may not be understood OR may not be reversible.

based on any of the following:

(a) direct observation [*except A3*]

(b) an index of abundance appropriate to the taxon

(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat

(d) actual or potential levels of exploitation

(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Evidence:

Eligible under Criterion 1 A2 (a) for listing as Endangered

The global estimate was 130 000 individuals including 40 000 of *C.m. mongolus* and 20 000 of *C. m. stegmanni* (Bamford et al. 2008; Garnett et al. 2011). This population estimate is out of date given the ongoing population declines. There are no population estimates of the Australian population, however, Garnett et al. (2011) assumed the population to be 24 000 (both subspecies combined).

Numbers (both subspecies combined) declined by c.84% across 49 Australian sites between c.1983 and c.2007 (AWSG data cited in Garnett et al. 2011) although there were few data from northern Australia (e.g. Rogers et al. 2009). At the Pioneer River mouth (Mackay, Queensland), counts of lesser sand plover declined from an average of 517 birds in January 1999 to 71 birds in March 2003 (Harding & Milton 2003).

Population trends outside of Australia are poorly known. However, in Japan, the two subspecies combined have declined in general, and by about 61% in autumn between 1978 and 2008 (Amano et al. 2010). The *Action Plan for Australian Birds 2010* suggested an overall 50–79% decline over 16 years across the EAAF (Garnett et al 2011). On the basis of this observed decline in numbers visiting Australia, the Australian status of the subspecies *C. m. mongolus* and the subspecies *C. m. stegmanni* has been assessed as endangered by Garnett et al. (2011).

A subsequent and more detailed assessment by a University of Queensland team (partly funded by the Department of the Environment under an Australian Research Council collaborative grant), suggests the rate of decline is large enough to pass the threshold for the endangered category (Studds et al., submitted). Time series data from directly observed summer counts at a large number of sites across Australia indicate a severe population decline of 74.8% over 24 years (6% per year) which for this species (both subspecies combined) is equal to three generations (Studds et al., submitted).

In large part, the observed decline in lesser sand plover numbers across Australia stems from ongoing loss of intertidal mudflat habitat at key migration staging sites in the Yellow Sea (Murray et al. 2014). Threats are also occurring in Australia including coastal development, habitat degradation and human disturbance. As such, qualification under criterion A2 rather than A1 seems warranted.

The Committee considers that the species has undergone a severe reduction in numbers over three generation lengths (24 years for this assessment), equivalent to at least 74.8 percent and the reduction has not ceased, the cause has not ceased and is not understood. Therefore, the species has been demonstrated to have met the relevant elements of Criterion 1 to make it eligible for listing as Endangered.

Criterion 2.	**Geographic distribution as indicators for either extent of occurrence AND/OR area of occupancy**		
	Critically Endangered Very restricted	**Endangered Restricted**	**Vulnerable Limited**
B1. Extent of occurrence (EOO)	**< 100 km²**	**< 5,000 km²**	**< 20,000 km²**
B2. Area of occupancy (AOO)	**< 10 km²**	**< 500 km²**	**< 2,000 km²**
AND at least 2 of the following 3 conditions:			
(a) Severely fragmented OR Number of locations	**= 1**	**≤ 5**	**≤ 10**
(b) Continuing decline observed, estimated, inferred or projected in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) area, extent and/or quality of habitat; (iv) number of locations or subpopulations; (v) number of mature individuals			
(c) Extreme fluctuations in any of: (i) extent of occurrence; (ii) area of occupancy; (iii) number of locations or subpopulations; (iv) number of mature individuals			

Evidence:

Not eligible

Within Australia the species showed an overall decline in area of occupancy between the early 1980s and the late 1990s to the early 2000s (Barrett et al. 2003). However, the extent of occurrence in currently Australia is estimated to be 35 300 km^2 (stable) and area occupied 2 600 km^2 (stable; Garnett et al. 2011). Therefore, the species does not meet this required element of this criterion.

Criterion 3. Population size and decline			
	Critically Endangered Very low	**Endangered Low**	**Vulnerable Limited**
Estimated number of mature individuals	**< 250**	**< 2,500**	**< 10,000**
AND either (C1) or (C2) is true			
C1 An observed, estimated or projected continuing decline of at least (up to a max. of 100 years in future)	**Very high rate 25% in 3 years or 1 generation (whichever is longer)**	**High rate 20% in 5 years or 2 generation (whichever is longer)**	**Substantial rate 10% in 10 years or 3 generations (whichever is longer)**
C2 An observed, estimated, projected or inferred continuing decline AND its geographic distribution is precarious for its survival based on at least 1 of the following 3 conditions:			
(a) (i) Number of mature individuals in each subpopulation	**≤ 50**	**≤ 250**	**≤ 1,000**
(a) (ii) % of mature individuals in one subpopulation =	**90 – 100%**	**95 – 100%**	**100%**
(b) Extreme fluctuations in the number of mature individuals			

Evidence:

Not eligible

The number of mature individuals in Australia was estimated at 24 000 (decreasing) in 2011 (Garnett et al. 2011), but has declined since. There are no current data available to allow assessment against this criterion. Therefore, the species does not meet this required element of this criterion.

Criterion 4. Number of mature individuals			
	Critically Endangered Extremely low	**Endangered Very Low**	**Vulnerable Low**
Number of mature individuals	**< 50**	**< 250**	**< 1,000**

Evidence:

Not eligible

The number of mature individuals in Australia was estimated at 24 000 in 2011 (Garnett et al., 2011), but has declined since. The estimate is not considered extremely low, very low or low. Therefore, the species does not meet this required element of this criterion.

Criterion 5. Quantitative Analysis			
	Critically Endangered Immediate future	**Endangered Near future**	**Vulnerable Medium-term future**
Indicating the probability of extinction in the wild to be:	**≥ 50% in 10 years or 3 generations, whichever is longer (100 years max.)**	**≥ 20% in 20 years or 5 generations, whichever is longer (100 years max.)**	**≥ 10% in 100 years**

Evidence:

Not eligible

Population viability analysis has not been undertaken

Conservation Actions

Recovery Plan

There should not be a recovery plan for this species, as approved conservation advice provides sufficient direction to implement priority actions and mitigate against key threats. Significant management and research is being undertaken at international, national, state and local levels.

Conservation and Management Actions

- Work with governments along the East Asian – Australasian Flyway to prevent destruction of key breeding and migratory staging sites.
- Protect important habitat in Australia.
- Support initiatives to improve habitat management at key sites.
- Maintain and improve protection of roosting and feeding sites in Australia.
- Advocate for the creation and restoration of foraging and roosting sites.
- Incorporate requirements for lesser sand plover into coastal planning and management.
- Manage important sites to identify, control and reduce the spread of invasive species.
- Manage disturbance at important sites which are subject to anthropogenic disturbance when lesser sand plovers are present – e.g. discourage or prohibit vehicle access, horse riding and dogs on beaches, implement temporary site closures.

Survey and monitoring priorities

- Enhance existing migratory shorebird population monitoring programmes, particularly to improve coverage across northern Australia.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

Information and research priorities

- Undertake work to more precisely assess lesser sand plover life history, population size, distribution and ecological requirements particularly across northern Australia.
- Improve knowledge about dependence of lesser sand plover on key migratory staging sites, and non-breeding sites to the in south-east Asia.
- Improve knowledge about threatening processes including the impacts of disturbance and hunting.

Recommendations

(i) The Committee recommends that the list referred to in section 178 of the EPBC Act be amended by **including** in the list in the Endangered category:

Charadrius mongolus

(ii) The Committee recommends that there not be a recovery plan for this species.

Threatened Species Scientific Committee

01/03/2016

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