Australian Government
Department of the Environment

Consultation Document on Listing Eligibility and Conservation Actions

Calidris tenuirostris (great knot)

You are invited to provide your views and supporting reasons related to:

1) the eligibility of *Calidris tenuirostris* (great knot) for inclusion on the EPBC Act threatened species list in the critically endangered category; and

2) the necessary conservation actions for the above species.

Evidence provided by experts, stakeholders and the general public are welcome. Responses can be provided by any interested person.

Anyone may nominate a native species, ecological community or threatening process for listing under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or for a transfer of an item already on the list to a new listing category. The Threatened Species Scientific Committee (the Committee) undertakes the assessment of species to determine eligibility for inclusion in the list of threatened species and provides its recommendation to the Australian Government Minister for the Environment.

Draft information for your consideration of the eligibility of this species for listing as critically endangered starts at page 7 and information associated with potential conservation actions for this species starts at page 10. To assist with the Committee's assessment, the Committee has identified a series of specific questions on which it seeks your guidance at page 12.

Responses are to be provided in writing either by email to:
species.consultation@environment.gov.au

or by mail to:

The Director
Migratory Species Section
Wildlife, Heritage and Marine Division
Department of the Environment
PO Box 787
Canberra ACT 2601

Responses are required to be submitted by 4 December 2015.

General background information about listing threatened species

The Australian Government helps protect species at risk of extinction by listing them as threatened under Part 13 of the EPBC Act. Once listed under the EPBC Act, the species becomes a Matter of National Environmental Significance (MNES) and must be protected from significant impacts through the assessment and approval provisions of the EPBC Act. More information about threatened species is available on the department's website at: http://www.environment.gov.au/biodiversity/threatened/index.html.

Public nominations to list threatened species under the EPBC Act are received annually by the department. In order to determine if a species is eligible for listing as threatened under the EPBC Act, the Threatened Species Scientific Committee (the Committee) undertakes a rigorous scientific assessment of its status to determine if the species is eligible for listing against a set of criteria. These criteria are available on the Department's website at: http://www.environment.gov.au/biodiversity/threatened/pubs/guidelines-species.pdf.

As part of the assessment process, the Committee consults with the public and stakeholders to obtain specific details about the species, as well as advice on what conservation actions might be appropriate. Information provided through the consultation process is considered by the Committee in its assessment. The Committee provides its advice on the assessment (together with comments received) to the Minister regarding the eligibility of the species for listing under a particular category and what conservation actions might be appropriate. The Minister decides to add, or not to add, the species to the list of threatened species under the EPBC Act. More detailed information about the listing process is at: http://www.environment.gov.au/biodiversity/threatened/nominations.html.

To promote the recovery of listed threatened species and ecological communities, conservation advices and where required, recovery plans are made or adopted in accordance with Part 13 of the EPBC Act. Conservation advices provide guidance at the time of listing on known threats and priority recovery actions that can be undertaken at a local and regional level. Recovery plans describe key threats and identify specific recovery actions that can be undertaken to enable recovery activities to occur within a planned and logical national framework. Information about recovery plans is available on the department's website at: http://www.environment.gov.au/biodiversity/threatened/recovery.html.

Information about this consultation process

Responses to this consultation can be provided electronically or in hard copy to the contact addresses provided on Page 1. All responses received will be provided in full to the Committee and then to the Australian Government Minister for the Environment.

In providing comments, please provide references to published data where possible. Should the Committee use the information you provide in formulating its advice, the information will be attributed to you and referenced as a 'personal communication' unless you provide references or otherwise attribute this information (please specify if your organisation requires that this information is attributed to your organisation instead of yourself). The final advice by the Committee will be published on the department's website following the listing decision by the Minister.

Information provided through consultation may be subject to freedom of information legislation and court processes. It is also important to note that under the EPBC Act, the deliberations and recommendations of the Committee are confidential until the Minister has made a final decision on the nomination, unless otherwise determined by the Minister.

Calidris tenuirostris

Great knot

Taxonomy

Conventionally accepted as *Calidris tenuirostris* Horsfield, 1821. Scolopacidae.

Other common names include slender-billed knot; stripe-crowned knot; eastern knot; large sandpiper; great sandpiper (Higgins & Davies 1996).

Monotypic, no subspecies are recongised. Taxonomic uniqueness: medium (22 genera/family, 20 species/genus, 1 subspecies/species; Garnett et al. 2011).

Species/Sub-species Information

Description

The great knot is the largest of the calidrid shorebirds. It is a medium-sized shorebird and grows to a length of 26–28 cm with a wingspan of approximately 58 cm. Females are slightly larger than males. It has a straight, slender bill that is black with a green tinge at the tip. The eye is brown and legs and feet are dark greenish-grey. The bird has noticeable breeding, non-breeding and juvenile plumages (Higgins & Davies 1996).

In Australia, they are usually seen in non-breeding plumage which is grey upperparts with pale scalloping, and white underparts with heavy streaking on the neck, grading to spots on the breast. In breeding plumage, great knots have a black band across the chest, and black, white and reddish speckles on the upperparts (BirdLife Australia 2012). Juveniles are darker and browner than non-breeding adults and the breast is washed buff-brownish and streaked and spotted dark brown (Higgins & Davies 1996).

When is Australia, the great knot can be confused with similar species. The red knot *Calidris canutus* is slightly smaller with a shorter, more slender bill and a more prominent eyebrow, smaller spots on the underparts, and shorter wings. The curlew sandpiper *Calidris ferruginea* is smaller and has a down-curved bill (BirdLife Australia 2012).

Distribution

Australian distribution

The great knot breeds in the northern hemisphere and undertakes biannual migrations along the East Asian-Australasian Flyway, EAAF. Most of the population winters in Australia (probably >90%; Bamford et al. 2008), mainly at sites on the northern coast (CMS 2014).

The great knot has been recorded around the entirety of the Australian coast, with a few scattered records inland. It is no longer regular at some sites along the south coast of Australia which used to support small numbers (Garnett et al. 2011). The greatest numbers are found in northern Western Australia and the Northern Territory. The species is common on the coasts of the Pilbara and Kimberley, from the Dampier Archipelago to the Northern Territory border, and in the Northern Territory from Darwin and Melville Island, through Arnhem Land to the south-east Gulf of Carpentaria. Other important sites include the Broad Sound-Shoalwater Bay area, the Mackay region and Moreton Bay in Queensland. The species is much less common in south-west Australia, South Australia, Victoria and Tasmania (Higgins & Davies 1996).

For the population visiting Australia, the extent of occurrence is estimated to be 35,000 km^2 (stable) and the area of occupancy is 2800 km^2 and decreasing (Garnett et al. 2011).

Global distribution

The great knot breeds in north-east Siberia and the far north-east of Russia. The species has been recorded from the mouth of the Kolyma River and the Gorelovy Mountains (possibly from

Verkhoyanskii Ranges), and from the eastern Anadyr and Koryatsky Ranges (Higgins & Davies 1996).

The great knot is one of 36 migratory shorebird species that breed in the northern hemisphere and are known to regularly migrate to the non-breeding grounds of Australia along the East Asian–Australasian Flyway (EAAF). 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 (DOE 2014).

During migration common stop-over areas for the great knot include east China, the Korean Peninuslar and Japan. Less common stop-over areas include the Philippines, Vietnam, Thailand, Malaysia, Indonesia and Papua New Guinea (Higgins & Davies 1996; Barter 2002). The species is also a vagrant in New Zealand, the Arabian Peninsula, the islands of the Indian Ocean, Morocco, north-west Europe and Alaska (Higgins & Davies 1996).

The bays and estuaries of the north-east and north-west parts of the Sea of Okhotsk and northern Sakhalin Island (Russia) have been identified as important staging areas for the southward migration of the great knot (Tomkovich 1997). The Yellow Sea supports about 80% of the EAAF great knot population especially on its northward migration (CMS 2014). Fifteen sites of international importance for the northward migration have been identified in the Yellow Sea area, compared to nine for the southern migration. The area provides a rich feeding source for the birds prior to their flight to Russian breeding grounds which may be still covered in ice and snow making foraging difficult (Bamford et al. 2008).

During the non-breeding season, although most of the great knot population occurs in Australia, small numbers are also known to winter from Myanmar and Bangladesh, west to the Bay of Bengal, and occasionally to the Persian Gulf (Higgins & Davies 1996).

Relevant Biology/Ecology

Life history

A generation time of 8.6 years (BirdLife International 2015) is derived from age at first breeding of 1.7 years, an annual adult survival of 79% (both extrapolated from congeners) and a maximum longevity of 19.7 years (Australian Bird and Bat Banding Scheme; Garnett et al. 2011).

Breeding

The great knot does not breed in Australia.

This species breeds in north-east Siberia and the far north-east of Russia (Higgins & Davies 1996) where it shows a high fidelity to breeding sites (del Hoyo et al. 1996). The great knot is monogamous (Battley et al. 2004) and lays 3-4 eggs in late May to late June. Incubation takes around 21 days. The female departs the breeding grounds after the eggs hatch leaving the male to tend to the chicks (del Hoyo et al. 1996). Around 47–57% of chicks survive to fledge, and fledging takes approximately 20–25 days. Young are independent a few days after fledging. Around 2.3–2.8 fledglings are raised per brood (Tomkovich 1996).

General habitat

In Australia, great knots prefer sheltered coastal habitats with large intertidal mudflats or sandflats. This includes inlets, bays, harbours, estuaries and lagoons. They are occasionally found on exposed reefs or rock platforms, shorelines with mangrove vegetation, ponds in saltworks, at swamps near the coast, salt lakes and non-tidal lagoons. The species rarely occurs on inland lakes and swamps (Higgins & Davies 1996; del Hoyo et al. 1996; Rogers et al. 2006). Along sheltered coasts with areas of intertidal mudflats, they often congregate with other small

species of shorebirds and can form large flocks comprising hundreds or thousands of birds (BirdLife Australia 2012).

Roosting habitat

Typically, the great knot roosts in large groups in open areas, often at the water's edge or in shallow water close to feeding grounds (Higgins & Davies 1996; Rogers 2001). A group of approximately 8 610 birds have been recorded roosting at an inland claypan near Roebuck Bay in north-west Western Australia (Collins et al. 2001).

Diet

The great knot feeds on invertebrates by pecking at or just below the surface of moist mud or sand. They feed on bivalves, gastropods, crustaceans and other invertebrates (Higgins and Davies 1996; Moores 2006; Garnett et al. 2011).

Migration patterns

The great knot is one of 36 migratory shorebird species that breed in the northern hemisphere and are known to regularly migrate to the non-breeding grounds of Australia along the EAAF. 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 (DOE 2014).

During migration common resting areas for the great knot include east China, the Republic of Korea and Japan. Less common resting areas include the Philippines, Vietnam, Thailand, Malaysia, Indonesia and Papua New Guinea (Higgins & Davies 1996; Barter 2002).

Departure from breeding grounds

Post-breeding migration starts in late June and seems to occur in three waves up to early September. Birds fly towards the northern Sea of Okhotsk, though individuals have been recorded in inland Ussuriland, Russia. Non-breeders, failed breeders and females migrate southward first, followed by males which have bred successfully which are then followed by young birds (Tomkovich 1997).

The great knot passes through south-east Siberia, and along the coasts of the Sea of Okhotsk, southern Ussuriland (from early August to early September), Sea of Japan, Republic of Korea (late August to mid-October), East China Sea (late July to late October, but mostly August to September), Taiwan (September-October) and Hong Kong (late August-November) (Barter 2002; Higgins & Davies 1996; Tomkovich 1997). Other stop-overs occur in Myanmar, Thailand, the Philippines, western Micronesia, Cambodia, Vietnam, Malaysia, Indonesia, Wallacea, Borneo, Bali, Timor and Papua New Guinea (Higgins & Davies 1996).

Non-breeding season

The great knot arrives on southern non-breeding grounds between August and October (CMS 2014). Large numbers arrive in north-west Australia in late August-early September (Lane 1987), though juveniles and many males may not arrive till October-November (Barter 1986). Most birds stay in northern Australia (Lane 1987) although some move further south and occasionally reach New Zealand (Higgins & Davies 1996) and some move through the Torres Strait (Draffan et al. 1983).

Some birds do move from north-west Australia by November with some arriving at the Gulf of Carpentaria in September-December and some arriving on the east coast in September-November. A few birds may move through inland Queensland, NSW and Victoria from September-February (Higgins & Davies 1996). Usually great knots arrive in South Australia, Victoria and Tasmania from October-November (Lane 1987). Some appear to move from north-west to south-west Australia along the western coast, sometimes moving into south-west

Australia in October. At Eyre Bird Observatory, the great knot generally arrives late August-December.

Return to breeding grounds

The great knot is a long-haul migrant that leaves north-west Australia in late March to early April and flies 5400-6000 km non-stop to migration staging sites in China and the Republic of Korea (Battley et al. 2003). Thousands of great knots have been recorded in south-east Irian Jaya in February-April.Immature non-breeders often remain in the tropical parts of the wintering range for the austral winter. The species forages in large flocks of one hundred to many thousand at favoured sites on passage (del Hoyo et al. 1996; CMS 2014). One of the most important staging sites for this species during the northward migration is Yalu Jiang coastal wetland in the north Yellow Sea with an annual average of 44 000 great knots at this site in 2010-12 (i.e. 22% of EAAF population) (Choi et al. 2015). Birds arrive in the breeding grounds from late May with males arriving before females (Tomkovich 1996).

Threats

Migratory shorebirds, such as the great knot, are sensitive to certain development activities due to their high site fidelity, tendency to aggregate, very high energy demands, and need for habitat networks containing both roosting and foraging sites (DEWHA 2009a).

Threats to the global population of the great knot across its range include: habitat loss and habitat degradation (e.g. through land reclamation, industrial use and urban expansion; changes to the water regime; invasive plants; water quality deterioration; environmental pollution); pollution/contaminants; disturbance; diseases; direct mortality e.g. hunting; and climate change impacts (Moores 2006; Rogers et al. 2006; Garnett et al. 2011; Curran et al. 2014).

Habitat loss and habitat degradation

Almost half of the Republic of Korea's tidal-flats have been reclaimed or degraded (Moores et al. 2008). One of the largest reclamation projects in the world is the Saemangeum project which, through the construction of a 33-km long seawall, has converted two free-flowing estuaries and 40 100 ha of tidal-flats and sea shallows into a vast reservoir and surrounding land (Moores et al. 2008; Murray et al. 2014). Twenty-eight percent 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).

The great knot is probably more vulnerable to reclamation activities than most other shorebirds due to the very specific species and sizes of shellfish that they eat. Wetland degradation in the Yellow Sea is a particular threat to the great knot as 80% of the population stages in this area on the northward migration (Garnett et al. 2011).

Threats in Australia also include local mangrove encroachment on foraging habitat (DEWHA 2009b) and habitat loss and degradation from pollution, changes to the water regime and invasive plants (Garnett et al 2011; CMS 2014). Intensive oil exploration, water regulation and diversion infrastructure in major water tributaries have resulted in the reduction of water and sediment flows which compound the problem of habitat loss for shorebird species (Barter 2002).

Pollution/contaminants

Migratory shorebirds are adversely affected by pollution (e.g. organochlorines or heavy metals discharged into the sea from industrial or urban sources) both on passage and in non-breeding areas (e.g. Harding et al. 2007). An analysis of the feathers of great knots at Okgu Mudflat, Republic of Korea showed that iron, zinc and copper concentrations in the feathers were within the normal range of other studies for wild birds in the world. However, some of the great knots had elevated concentrations of lead and cadmium (Kim & Oh 2012). High lead concentrations

could cause sublethal and reproductive effects and high cadmium concentrations could cause reduced growth rates of bone (Kim & Oh 2012).

Disturbance

Human disturbance can cause waders to interrupt their feeding or roosting and may influence the area of otherwise suitable feeding 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). Disturbance from construction activities, recreational activities, shellfish harvesting, fishing and aquaculture is likely to increase significantly in the future (Barter 2005; Rogers 2001). Causes of disturbance to shorebirds in Roebuck Bay, Western Australia included birds of prey (39%), people or vehicles (18%) and false alarms (10%, i.e. no cause for disturbance), with the remaining disturbance (33%) being from unknown causes (Rogers 2001).

Diseases

The viral disease testing of Charadriiformes from coastal northwest Australia did not detect any evidence of avian influenza virus excretion in the great knot or any other species from testing carried out since 1992. However, from serologic testing, there was evidence of a very low level of past exposure to the virus (Curran et al. 2014).

Direct mortality

The great knot is still hunted in many countries on migration (Ming et al. 1998; CMS 2014). Number taken each year are unknown.

Climate change

Climate change 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 (Melville 1997; Harding et al. 2007). Rises in sea level could have a major impact on the great knot due to loss of intertidal habitat (Iwamura et al. 2013). Modelling indicates that the great knot could lose 35% of its remaining population with a 200 cm sea level rise (Iwamura et al. 2013).

Migratory shorebirds, such as the great knot, that live in the tropics before embarking on long migration flights (>5000 km) are susceptible to heat load issues leading up to departure (Battley et al. 2003).

Assessment of available information 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.	*based on any of the followin*	(a) direct observation [*except A3*]
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.		(b) an index of abundance appropriate to the taxon
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*]		(c) a decline in area of occupancy, extent of occurrence and/or quality of habitat
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.		(d) actual or potential levels of exploitation
			(e) the effects of introduced taxa, hybridization, pathogens, pollutants, competitors or parasites

Evidence:

The global population was previuosly estimated at c.380,000 individuals including 360,000 estimated in Australia (Bamford et al. 2008). The Australian population (number of mature individuals) was revised down by Garnett et al. (2011) to 290,000 (Garnett et al. 2011; BirdLife International 2015). This population estimate is likely out of date given the ongoing population declines.

In Australia, numbers declined at survey locations including a 24% decline at Eighty-mile Beach, WA between 2000–2008 (Rogers et al. 2009; Garnett et al. 2011), a 4.5% per year between 1992 and 2008 at Moreton Bay, Qld (Wilson et al. 2011), and a 34% decline across 49 sites between 1983 and 2007 (Garnett et al. 2011). A recent survey of significant coastal wetlands in the north and north-east Australia found no evidence that great knots have shifted their wintering grounds in Australia (Chatto 2012; CMS 2014).

The numbers of great knots at Yalu Jiang (north Yellow Sea), one of the most important staging sites for this species, declined by 18% from 1999 to 2010-12 (Choi et al. 2015).

The great knot is classified as vulnerable on the IUCN Red List owing to the rapid population decline caused by the reclamation of non-breeding stopover grounds, and under the assumption that further proposed reclamation projects will cause additional declines in the future (BirdLife International 2015).

A recent more detailed assessment by a University of Queensland team (partly funded by the Department of the Environment under an Australian Research Council collaborative grant), puts the species into the critically endangered category (Fuller, pers. comm., 2014). Time series data from directly observed summer counts at a large number of sites across Australia indicate a very severe population decline of 83.1% over 25 years (7.1% per year) which for this species is equal to three generations (Fuller, pers. comm., 2014).

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

The data presented above appear to demonstrate that the species is **eligible for listing as critically endangered** A2(a) under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

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 indicating distribution is precarious for survival:			
(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:

The extent of occurrence in Australia is estimated at 35 000 km^2 (stable) and area occupied 2 800 km^2 (decreasing; Garnett et al., 2011).

The data presented above appear to demonstrate the species is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

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**
	(ii) % of mature individuals in one subpopulation =	**90 – 100%**	**95 – 100%**	**100%**
(b)	Extreme fluctuations in the number of mature individuals			

The number of mature individuals in Australia was estimated at 290 000 (decreasing) in 2011 (Garnett et al., 2011), but has declined since. There are no current data available to allow assessment against this criterion.

The data presented above appear to demonstrate the species is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

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

Evidence:

The number of mature individuals in Australia was estimated at 290 000 in 2011 (Garnett et al., 2011), but has declined since. The estimate is not considered extremely low, very low or low.

The data presented above appear to demonstrate the species is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

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:

Population viability analysis has not been undertaken.

The data presented above appear to demonstrate the species is not eligible for listing under this criterion. However, the purpose of this consultation document is to elicit additional information to better understand the species' status. This conclusion should therefore be considered to be tentative at this stage, as it may be changed as a result of responses to this consultation process.

Conservation Actions

Recovery Plan

A decision about whether there should be a recovery plan for this species has not yet been determined. The purpose of this consultation document is to elicit additional information to help inform this decision.

Conservation and Management Actions

- Work with governments along the East Asian – Australiasian 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 great knot into coastal planning and management.
- Manage important sites to identify, control and reduce the spread of invasive species.
- Manage disturbance at important sites when great knots are present – e.g. discourage or prohibit vehicle access, horse riding and dogs on beaches, implement temporary site closures.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

Survey and Monitoring priorities

- Enhance existing migratory shorebird population monitoring programmes, particularly to improve coverage across northern Australia.

Information and research priorities

- Undertake work to more precisely assess great knot life history, population size, distribution and ecological requirements particularly across northern Australia.
- Improve knowledge about dependence of great knot 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.

Collective list of questions – your views

1. Do you agree with the current taxonomic position of the Australian Faunal Directory and Birdlife Australia for this species (as identified in the draft conservation advice)

2. Can you provide any additional references, information or estimates on longevity, age of maturity, average life span and generation length?

3. Has the survey effort for this species been adequate to determine its national distribution and adult population size?

4. Do you accept the estimate provided in the nomination for the current population size of the species?

5. For any population with which you are familiar, do you agree with the population estimate provided? If not, are you able to provide a plausible estimate based on your own knowledge? If so, please provide in the form:
   Lower bound (estimated minimum):
   Upper bound (estimated maximum):
   Best Estimate:
   Estimated level of Confidence: %

6. Can you provide any additional data, not contained in the current nomination, on declines in population numbers over the past or next 10 years or 3 generations, whichever is the longer?

7. Is the distribution as described in the nomination valid? Can you provide an estimate of the current geographic distribution (extent of occurrence or area of occupancy in km^2) of this species?

8. Has this geographic distribution declined and if so by how much and over what period of time?

9. Do you agree that the species is eligible for inclusion on the threatened species list, in the category listed in the nomination?

10. Do you agree that the threats listed are correct and that their effects on the species are significant?

11. To what degree are the identified threats likely to impact on the species in the future?

12. Can you provide additional or alternative information on threats, past, current or potential that may adversely affect this species at any stage of its life cycle?

13. In seeking to facilitate the recovery of this species, can you provide management advice for the following:

    - What individuals or organisations are currently, or need to be, involved in planning to abate threats and any other relevant planning issues?
    - What threats are impacting on different populations, how variable are the threats and what is the relative importance of the different populations?
    - What recovery actions are currently in place, and can you suggest other actions that would help recover the species? Please provide evidence and background information.

14. Can you provide additional data or information relevant to this assessment?

References cited in the advice

Bamford M., D. Watkins, W. Bancroft, G. Tischler & J. Wahl (2008). *Migratory Shorebirds of the East Asian - Australasian Flyway: Population estimates and internationally important sites*. [Online]. Canberra, ACT: Department of the Environment, Water, Heritage and the Arts, Wetlands International-Oceania. Available from: http://www.environment.gov.au/biodiversity/migratory/publications/shorebirds-east-asia.html.

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