



12 November 2014

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Dear Director,

**SUBMISSION ON THE PROPOSED EPBC LISTING OF EASTERN CURLEW**  
(*Numenius madagascariensis*)

The UNSW Centre for Ecosystem Science (CES) strongly supports efforts to assess Australia's migratory shorebirds for listing under the *Environmental Protection and Biodiversity Conservation Act (1999)*. To assist this process, we are pleased to provide a submission on the proposed listing of Eastern Curlew as *Endangered*. Our submission offers scientific advice, provides several new references and highlights several new issues that are relevant to this listing.

First, we agree that the Eastern Curlew is eligible for listing as *Endangered*. However, the population estimates provided in the listing advice are outdated, likely overestimating the true population. A recently published update of the Bamford *et al* (2008) report suggests that the global Eastern Curlew population is closer to 32,000 than the 38,000 stated in the listing advice (WWF).

Second, the listing advice quite rightly identifies Yellow Sea habitat loss as a major threat to shorebirds in the EAAF. However, a recently completed IUCN Red List of Ecosystems assessment of the Yellow Sea tidal flat ecosystem (*Endangered*) has revealed that in addition to the ~65% decline in areal extent of tidal flats, tidal flats are severely degraded due to overfishing, pollution and resource extraction (Murray *et al.*, *in press*). This assessment showed extreme declines of a range of environmental variables that indicate the entire ecosystem is at risk of collapse, including sediment inputs, benthic species diversity and fisheries production. Thus, conservation measures supported by the Australian Government that are focused on the Yellow Sea region should not only focus on habitat loss, but must also include amelioration of these additional threats, none of which were identified in the listing advice.

Lastly, we urge the Commonwealth Government to rapidly assess all migratory shorebird species that are listed as migratory under the EPBC Act. Data are emerging from across the flyway that several other species have undergone declines as severe as both Eastern Curlew and Curlew Sandpiper (*Calidris ferruginea*). For example, in addition to the Eastern Curlew, there are proposals for adding the Bar-tailed Godwit (*Limosa lapponica*), Great Knot (*Calidris tenuirostris*) and Red Knot (*Calidris canutus*) to the *Convention of Migratory Species Concerted Action List*, demonstrating widespread international concern for these species. Indeed, several Australian species are listed as Least Concern or greater on the global IUCN Red List of Threatened Species.

Please find a detailed point-by-point response to the questions to stakeholders below. The yearly migration of shorebirds across the East Asian-Australasian Flyway is among the most remarkable natural phenomena on Earth and swift action, including urgent assessments of shorebirds for listing on the EPBC Act, is required to sustain this migration.

Yours faithfully,

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On behalf of the UNSW Centre for Ecosystem Science |

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## Questions to Stakeholders

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)

Yes.

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

No.

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

Yes. Australia's volunteer shorebird groups have been completing regular, high quality counts of shorebirds for > 20 years. Importantly, this species is easily identifiable and identification error during counts is unlikely. Furthermore, counts from other areas of the East Asian-Australasian Flyway have also indicated declines of this species (Amano *et al.* 2010). In addition, this species is included on both the global Red List of Threatened Species (Vulnerable) and in other countries around the EAAF (such as Japan, Vulnerable).

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

Without any better data, yes. The population estimates provided here are based on a single 2008 report (Bamford *et al.* 2008), which itself was a synthesis of published count data from a range of sources. Several counts in the Bamford report date back to the mid-1980s, and a recent reanalysis by the World Wildlife Fund resulted in a revised global population of 32,000, a 15% decline since the publication of the Bamford report. We understand that the University of Queensland ARC Shorebird Project will provide the data supporting this listing (C. Studds & R. Fuller, *pers. comm.*). Alarming, the new proposal for adding the *Far Eastern Curlew to the CMS Concerted Action List during the 2014-2017 Triennium*, states that the true global population size is "unlikely to exceed 20,000". Therefore, to our knowledge there are no better data available for an Australian-wide population estimate and we accept the population estimates provided.

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: %

Not applicable.

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?

No. However, as these Eastern Curlew population are in Australia for only one part of their annual cycle, we encourage the Commonwealth Government to source data from anywhere across the East Asian-Australasian Flyway to assess population trends. Data may be available from several sources not considered in the consultation document:

1. Asian Waterbird Census Data
2. Chinese Coastal Counts managed by the Hong Kong Birdwatching Society
3. Some shorebird data is available from the UNSW East Australian Waterbird Surveys. The data show that small shorebirds have declined in inland Australia (Nebel *et al.* 2008).

Several other sources of data are likely available from researchers, NGOs and governments across the flyway.

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<sup>2</sup>) of this species?

Yes. We do not expect that the Area of Occupancy or Extent of Occurrence is smaller than described in the consultation document.

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

The distribution of Eastern Curlew in Australia is unlikely to have declined. Data on the European Black-tailed Godwit (*Limosa limosa*) declines showed that low quality sites are vacated first (Gill *et al.* 2001), so even though the Extent of Occurrence has probably remained the same the Area of Occupancy may have declined. However, to our knowledge no data is available to improve these assessments.

An important thing to note is that under the IUCN Red List of Threatened Species, the EOO and AOO of a species is assessed by “the smallest area essential at any stage to the survival of existing populations” (IUCN 2014). As the Eastern Curlew is migratory and nearly all of the population is reduced to a bottleneck in the Yellow Sea region of East Asia during migration, it may be more suitable to assess Criterion 2 at their staging sites, rather than within Australia. Indeed, this species is likely to meet the criteria 2B2 AND b(ii + iii).

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

Yes. Population data from a variety of sources suggest this species is eligible for listing as Endangered under the EPBC Act. Similarly, robust estimates of Yellow Sea habitat loss similarly provide the evidence required to list this species (MacKinnon *et al.* 2012; Murray *et al.* 2014; Murray *et al.* 2012). Besides the information provided in this letter, we found no inconsistencies in the application of the EPBC Act Criteria and Regulations.

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

Yes. However, one major threat that has not been addressed is the degradation of key intertidal habitats across the EAAF. The tidal flats of the Yellow Sea are set to be listed as Endangered on the Red List of Ecosystems, due to their decline in areal extent *and* their ongoing degradation caused by water extraction, overharvesting of finfish and shellfish, excessive pollution and resource extraction (Murray *et al.* in press).

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

The threats that are impacting this species are ongoing, and very likely to persist. For example, habitat loss in the Yellow Sea region that is caused by urban and industrial development is forecast to continue at a greater rate than at any point in the past (Ma *et al.*, in press). Similarly, habitat degradation throughout Asia is not slowing, as indicated by the IUCN listing of this ecosystem as Endangered (Murray *et al.* in press). Without significant international pressure and rapid implementation of conservation actions, we expect this species to continue to decline in Australia.

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?

Several threats that have not been highlighted in this consultation document are likely to continue to exert downward pressure on Eastern Curlew populations in Australia:

1. *Degradation of East Asian intertidal systems.* As already stated, intertidal ecosystems in Asia are declining in both area and quality. A recent assessment of the Yellow Sea tidal flats, the principal habitat for this species while on migration, indicate that it is Endangered under the Red List of Ecosystems criteria (Murray *et al.* in press).
2. *Sea Level Rise.* Research has shown that migratory shorebirds such as the Eastern Curlew, that rely solely on intertidal areas, are likely to significantly decline under all scenarios of Sea Level Rise (Iwamura *et al.* 2013).

3. *Climate Change*. The principal breeding regions of this species, the Arctic, is changing rapidly under climate change. For example, the wetlands that provide the resources required for breeding are changing rapidly and it has been suggested that these changes can impact migratory bird populations (Smith *et al.* 2005).

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?

Successful conservation of migratory shorebirds will require collaborative action across more than 24 range states that make up the East Asian-Australasian Flyway. Importantly, governments and NGOs that can assist conservation of the Eastern Curlew exist across the flyway, and effectively harnessing their work for conservation of Eastern Curlew (and all shorebirds) is required. Below we provide a list of organisations that we believe are involved or should be involved in recovery planning:

1. *East Asian-Australasian Flyway Partnership (EAAFP)*. Australia must continue to directly support (including financially) this network of governments, organisations and corporations that form the flyway partnership. This partnership provides a vital basis of conservation across the flyway and all efforts should be made to ensure it can continue to develop. Other global partnerships and agreements, such as the Africa-Eurasia Waterbird Agreement (AEWA) are proven conservation of migratory bird and the EAAFP should fulfil a similar role.
  2. *Governments of 24-26 nations*. Either through the EAAFP, or via other diplomatic pathways, governments of countries that are range states of the Eastern Curlew should be encouraged to enact conservation for this species.
  3. *Convention on Migratory Species (CMS)*. All signatories of the CMS and United Nations in the EAAF should be involved in conservation of migratory shorebirds.
  4. *NGOs across Asia*. A range of NGOs work on migratory shorebird conservation across Asia. These are Wetlands International, Birdlife International, IUCN, World Wildlife Fund, International Crane Foundation, Australian Wader Study Group (and state groups), Ramsar and many others.
- What threats are impacting on different populations, how variable are the threats and what is the relative importance of the different populations?

Please refer to the rest of our submission for consideration of the major threats to Australia's Eastern Curlew population

- 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.

The Eastern Curlew is already subject to a wide range of conservation actions in Australia and internationally. For example, much of their habitat occurs within coastal nature reserves, Ramsar sites and Internationally Important Wetlands. Below we provide a list of additional actions that would help recover the species.

1. *Collaborative Conservation.* The conservation of migratory shorebirds requires collaborative action with the ~24 countries that comprise the East Asian-Australasian Flyway. Although some collaborations already occur, including an international network of shorebird sites (managed by the EAAFP), more collaboration is required. Spending conservation funds in other countries is an option that can lead to better conservation outcomes, especially if actions are prioritised across the full flyway (Bull *et al.* 2013; Kark *et al.* 2009).
2. *Conserving migratory permeability.* With widespread losses of their principal habitat, encouraging a multitude of habitat conservation measures is a possible route to ensure continuing permeability of the flyway.
3. *Additional bilateral and multilateral policy.* Australia's bilateral agreements (JAMBA, CAMBA and ROKAMBA) have proved a useful mechanism for ensuring ongoing communications between key countries in the EAAF. Either encouraging other countries that are important for the Eastern Curlew migration, or strengthening existing agreements to enable increased collaborative conservation action would be a useful step.
4. *Increase research effort.* The listing of migratory shorebirds on the EPBC Act, though welcome, is coming after decades of suspected declines. Mobilising competitive funding for increased research on Australia's migratory shorebirds, now the fastest declining group of birds in Australia (Garnett *et al.* 2011; Szabo *et al.* 2012) would allow much-needed research into populations, habitats, threats and effective strategies to implement conservation actions.

For migratory shorebirds in the East Asian-Australasian Flyway research could profitably be focused on (i) expanding our understanding of habitat loss to migratory shorebirds across the full East Asian-Australasian Flyway, (ii) identifying and mapping other threats, such as hunting (Zockler *et al.* 2010), pollution (Liu and Diamond 2005) and habitat loss due to sea level rise (Galbraith *et al.* 2002; Iwamura *et al.* 2013) and (iii)

quantifying the effects of these threats on migratory populations through targeted studies on survivorship and population declines.

5. *Understanding and mitigating ongoing habitat loss.* Despite widespread suspected declines of migratory shorebirds due to habitat loss, methods have only recently been developed to identify and assess the status of key habitats (MacKinnon *et al.* 2012; Murray *et al.* 2014; Murray *et al.* 2012). Further work identifying habitats for shorebirds around Australia and across the flyway would better enable lucid decision making for habitat conservation. Key coastal habitats must be protected from known deleterious impacts such as tidal flat reclamation, degradation and dredging which are continuing to affect migratory shorebird habitats across Australia.

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

Australia's history of conserving species is littered with slow action that has resulted in species extinction (Martin *et al.* 2012). We are encouraged that the Commonwealth is taking action to assess the Eastern Curlew for listing as *Endangered* on the EPBC, and agree with its assessment.

## References

- Amano T., Szekely T., Koyama K., Amano H. & Sutherland W. J. (2010) A framework for monitoring the status of populations: An example from wader populations in the East Asian-Australasian flyway. *Biological Conservation* **143**, 2238-47.
- Bamford M., Watkins D., Bancroft W., Tischler G. & Wahl J. (2008) Migratory Shorebirds of the East Asian - Australasian Flyway: Population estimates and internationally important sites. Wetlands International - Oceania, Canberra, Australia.
- Bull J. W., Suttle K. B., Singh N. J. & Milner-Gulland E. J. (2013) Conservation when nothing stands still: moving targets and biodiversity offsets. *Frontiers in Ecology and the Environment* **11**, 203-10.
- Galbraith H., Jones R., Park R., Clough J., Herrod-Julius S., Harrington B. & Page G. (2002) Global climate change and sea level rise: Potential losses of intertidal habitat for shorebirds. *Waterbirds* **25**, 173-83.
- Garnett S., Szabo J. K. & Dutson G. (2011) The Action Plan for Australian Birds 2010. Collingwood, Australia.
- Gill J. A., Norris K., Potts P. M., Gunnarsson T. G., Atkinson P. W. & Sutherland W. J. (2001) The buffer effect and large-scale population regulation in migratory birds. *Nature* **412**, 436-8.
- IUCN. (2014) Guidelines for Using the IUCN Red List Categories and Criteria, Version 11.0. In: *Prepared by the Standards and Petitions Working Group of the IUCN SSC Biodiversity Assessments Sub-Committee in August 2008*.
- Iwamura T., Possingham H. P., Chadès I., Minton C., Murray N. J., Rogers D. I., Tremblay E. A. & Fuller R. A. (2013) Migratory connectivity magnifies the consequences of habitat loss from sea-level rise for shorebird populations. *Proceedings of the Royal Society B: Biological Sciences* **280**, 20130325.
- Kark S., Levin N., Grantham H. S. & Possingham H. P. (2009) Between-country collaboration and consideration of costs increase conservation planning efficiency in the Mediterranean Basin. *Proc. Natl. Acad. Sci. U. S. A.* **106**, 15368-73.
- Liu J. G. & Diamond J. (2005) China's environment in a globalizing world. *Nature* **435**, 1179-86.

- MacKinnon J., Verkuil Y. I. & Murray N. J. (2012) IUCN situation analysis on East and Southeast Asian intertidal habitats, with particular reference to the Yellow Sea (including the Bohai Sea). In: *Occasional Paper of the IUCN Species Survival Commission No. 47*. p. ii + 70 pp. IUCN, Gland, Switzerland and Cambridge, UK.
- Martin T. G., Nally S., Burbidge A. A., Arnall S., Garnett S. T., Hayward M. W., Lumsden L. F., Menkhorst P., McDonal E. & Possingham d.-M. H. P. (2012) Acting fast helps avoid extinction. *Conservation Letters*, no-no.
- Murray N. J., Clemens R. S., Phinn S. R., Possingham H. P. & Fuller R. A. (2014) Tracking the rapid loss of tidal wetlands in the Yellow Sea. *Frontiers in Ecology and the Environment* **12**, 267-72.
- Murray N. J., Ma Z. & Fuller R. A. (in press) Tidal flats of the Yellow Sea: a review of ecosystem status and anthropogenic threats *Austral Ecol.*
- Murray N. J., Phinn S. R., Clemens R. S., Roelfsema C. M. & Fuller R. A. (2012) Continental Scale Mapping of Tidal Flats across East Asia Using the Landsat Archive. *Remote Sensing* **4**, 3417-26.
- Nebel S., Porter J. L. & Kingsford R. T. (2008) Long-term trends of shorebird populations in eastern Australia and impacts of freshwater extraction. *Biological Conservation* **141**, 971-80.
- Smith L., Sheng Y., MacDonald G. & Hinzman L. (2005) Disappearing arctic lakes. *Science* **308**, 1429-.
- Szabo J. K., Butchart S. H. M., Possingham H. P. & Garnett S. T. (2012) Adapting global biodiversity indicators to the national scale: A Red List Index for Australian birds. *Biological Conservation* **148**, 61-8.
- Zockler C., Htin Hla T., Clark N. A., Syroechkovskiy E. E., Yakushev N., Daengphayon S. & Robinson R. (2010) Hunting in Myanmar is probably the main cause of the decline of the Spoon-billed Sandpiper. *Wader Study Group Bulletin* **117**.