



4<sup>th</sup> December 2015

The Director, Migratory Species Section  
Wildlife, Heritage and Marine Division  
Department of the Environment  
PO Box 787, Canberra ACT 2601  
E: [species.consultation@environment.gov.au](mailto:species.consultation@environment.gov.au)

Dear Director,

RE: SUBMISSION ON THE PROPOSED EPBC LISTING OF SIX MIGRATORY SHOREBIRD SPECIES/SUBSPECIES

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)*. Migratory shorebirds across the East Asian-Australasian Flyway (EAAF) are under severe pressure from habitat loss, degradation, hunting and other threatening processes. Our research on intertidal habitat losses from remote sensing and analyses of population data from across Australia indicate that these species are likely to be threatened when confronted with the listing criteria.

Our submission is structured as detailed point-by-point responses to the questions to stakeholders for each of the species/subspecies considered (see attached). As many of our points are relevant for all migratory shorebirds in the EAAF, we have minimised repetition by referring to similar points throughout the submission.

Please do not hesitate to contact either Dr Murray or Professor Kingsford via telephone or email for further information on this submission.

Yours faithfully,

**Nicholas Murray** *Research Associate*  
**Richard Kingsford** *Director*

On behalf of the UNSW Centre for Ecosystem Science |  
[www.ecosystem.unsw.edu.au](http://www.ecosystem.unsw.edu.au)

**Bar-tailed Godwit (*Limosa lapponica baueri*)**

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. The wealth of ongoing data captured by a range of government, private and non-government partners, such as by the AWSG and QWSG, is suitable for assessing the current population size in Australia. Although more survey data is always welcome, the citizen science datasets that are being used to assess population trajectories, as well as the large number of scientific publications on this species, is suitable for making a robust assessment.

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

Yes, we believe this is a fair estimate of the current size of the population in Australia. A recent analysis undertaken by N. Murray during his PhD at the University of Queensland (with R. Fuller and others) indicated that in 2012, the total population estimate was around 129,000 individuals for 16 sites in Australia and New Zealand. We understand that analyses undertaken by the UQ ARC shorebird project, including the forthcoming paper by Murray et al (in prep), supports the estimates made here.

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?*

Yes. See above.

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. Our analysis was completed within the UQ ARC shorebird project. Thus, our estimates will coincide with the estimates provided by Fuller et al at UQ.

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?*

We agree with the distribution as described in the nomination. However, the use of EOO and AOO for measuring the distribution of migratory birds should take into account that the majority of the flyway population stages in a very small region in East Asia. Therefore, to assess under Criterion 2 (which is mostly aimed at species withstanding catastrophic threats), it would be preferable to assess this criterion under the minimum occupied area within the annual cycle (staging sites only), rather than occurrences throughout the entire year.

An additional resource synthesising all banding data to identify movements of both subspecies of bar-tailed godwit is available at Wilson et al. (2007).

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

Unknown.

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

Yes. Our assessment of the principal habitat of this species (the Yellow Sea tidal flat ecosystem) in East Asia under the IUCN Red List of Ecosystems categories and criteria indicated that their primary habitat is Endangered owing to widespread declines in extent and biotic and abiotic functioning of the ecosystem (Murray et al. 2015). Indeed, the assessment shows that habitat loss and degradation are widespread and continuing across their full staging range (Murray et al. 2015). This suggests ongoing declines in the quality of habitat, and although the species clearly meets A2a thresholds, it could also be assessed under Criterion A2c (quality of habitat) and A2e (pollutants, introduced taxa). Refer to Murray et al (2015a) for further information on this listing under the Red List of Ecosystems.

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

Yes.

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

We expect that all of the threats listed will continue in the advice will continue into the future. Although some conservation action is being initiated for shorebirds in Asia, analyses by Ma et al. (2014) indicate that habitat losses in the region will continue into the future. In addition, the reduction in sediment discharge from major rivers across East Asia suggest that, even if habitat reclamation is stopped, erosion, compaction and subsidence will continue to reduce the area of habitat for this species (Murray et al. 2014, Murray et al. 2015). This process, when combined with sea level rise due to climate change (Iwamura et al. 2013), is a significant ongoing threat to all migratory shorebirds in the EAAF. Lastly, staging sites in this region will continue to be squeezed by the significant coastal migration of the China population in particular, with an 1800-km long coastal urban area forecast by 2030 (Seto et al. 2012). Our 2015 analysis of the performance of protected areas for migratory

shorebirds (Murray and Fuller 2015) shows that many protected areas are not adequately protecting intertidal habitat from threats.

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?*

Sutherland et al. (2012) is a useful “horizon scan” of potential threats to migratory shorebirds that could be considered in these assessments.

*Staging:* Refer to Murray et al 2015a, 2015b for detailed information on the threats that this species is exposed to while on migration in East Asia. In addition, habitats for shorebirds in the East Asia migratory bottleneck are also subject to severe pollution pressure (Keesing et al. 2011), experience extreme levels of human disturbance due to high population densities in coastal regions (MacKinnon et al. 2012), and suffer from widespread commercial harvesting of shorebird prey (An et al. 2007, Hong-Yan Yang et al. 2011). These threats have been suggested as a source of population decline in other species of shorebird (Amano et al. 2010, Wilson et al. 2011, MacKinnon et al. 2012), including the closely related black-tailed godwit in Europe (Gill et al. 2007, West et al. 2007).

*Breeding:* Arctic wetlands are under severe threat from climate change and widespread adjustments to arctic lake systems are occurring, evidenced by a pattern of increasing abundance of lakes in continuous permafrost zones and decreases in other zones (Smith et al. 2005, Avis et al. 2011). Climate change may also influence the timing of significant temperature-related events, such as the emergence of key food resources and the thawing of important breeding and staging habitats, both of which likely to influence the overall timing and success of migration for these two subspecies (Gill et al. 2014).

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?*

Conservation of migratory shorebirds requires collaborative action across more the full East Asian-Australasian Flyway. Thus, the Australian government should work closely with a range of organisations, governments and NGO's across the entire flyway, such as:

1. *Governments across the EAAF.* Bilateral and multilateral migratory bird agreements should be initiated with any countries that are currently not part of an agreement with Australia. Alternatively, informal networks between governments should be encouraged.
2. *East Asian-Australasian Flyway Partnership (EAAFP).* Australia should continue to support this network of governments, organisations and corporations. The partnership is critical for enabling conservation throughout the flyway and its continued operation is critical. Other global partnerships and agreements, such as the Africa-Eurasia Waterbird Agreement (AEWA), which is far better resourced than the EAAFP have proven highly effective for conservation of migratory shorebirds.

3. *NGO, particularly in Asia.* Many NGOs work on the conservation of shorebirds across Asia, and the Commonwealth government should seek ways to support their work. NGOs such as the Paulson Institute, Wetlands International, Birdlife International, IUCN, World Wildlife Fund, and many others should be involved in shorebird conservation efforts.
  4. *Universities across Asia.* Hundreds of researchers work on migratory shorebird conservation across Asia, and efforts to bring them together to develop effective conservation plans, gather knowledge on the movement of shorebirds and develop ongoing networks would be a fruitful exercise.
- *What threats are impacting on different populations, how variable are the threats and what is the relative importance of the different populations?*

NA

- *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.*

We believe migratory shorebirds in the EAAF are in peril. A key action should be the production of a flyway wide recovery plan supported by all relevant governments in the EAAF, which will include information on (i) protected areas, (ii) coordinated monitoring regimes, and (iii) adaptive management actions and targets. In addition, we suggest that:

- Preventing destruction at non-breeding sites should be added to the action list, as it is critical that the conservation actions are implemented across the full annual cycle of all shorebirds (Wilcove and Wikelski 2008);
- Monitoring of wetlands and intertidal habitats should be added to the survey and monitoring protocols.

Also refer to our submission on the Draft Wildlife Conservation Plan for Migratory Shorebirds.

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

We would be happy to discuss our submission and provide further detailed information, references and contacts if required.

**Bar-tailed Godwit (*Limosa lapponica menzbieri*)**

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. See response to bar-tailed godwit (*baueri*).

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

Yes. We do not know of any other sources of information on the population size of this subspecies. We expect that key organisations, such as the Global Flyway Network, will be useful for confirming these estimates.

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?

Yes. An analysis of 5 sites by Murray et al (in prep) indicated around 101,000 individuals present in 2012, which should coincide with the estimates provided by Fuller, Clemens et al at UQ. Note however, that our analysis is aimed at identifying drivers of population declines, so may deviate with theirs in some cases.

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. But see the new, highly relevant paper by Piersma et al. (In Press).

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, however, note our concerns above in applying EOO to shorebirds where the total population is restricted to just one part of the annual cycle in recent years. *L. l. menzbieri* are reduced to a small region of the Yellow Sea while staging on migration (Wilson et al. 2007, Gill et al. 2009, Conklin et al. 2010, Battley et al. 2012). This should be considered when assessing the EOO of this subspecies.

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

Unknown.

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

Yes. We agree the species is eligible for listing as critically endangered under criterion A2a. However, note our submission for *L. l. baueri* above regarding the recent assessment of the Yellow Sea tidal flats as Endangered, the principal habitat for the majority of the global population of this subspecies while on migration (Barter 2002, Wilson et al. 2007), the species could also be suitable for assessment under criterion A2a and A2e (Murray et al. 2015).

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

Yes.

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

See comments for *L. l. baueri*.

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?*

No. But see the new, highly relevant paper by Piersma et al. (In Press).

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.*

See comments for *L. l. baueri*.

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

A highly relevant publication has just been released that indicates the annual survival of this species is rapidly decreasing, and provides updated population

estimates (Piersma et al. In Press). They estimate that populations will halve from 2012 levels in three to four years.

Piersma T, Lok T, Chen Y et al. (In Press) Simultaneous declines in summer survival of three shorebird species signals a flyway at risk *Journal of Applied Ecology*.



**Red Knot (*Calidris canutus*)**

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. See response to bar-tailed godwit (*baueri*).

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

Yes. We do not know of any additional sources of information on the population size of this 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?*

NA

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, but see the new, highly relevant paper by Piersma et al. (In Press).

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, but see response to bar-tailed godwit (*baueri*).

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

Unknown.

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

Yes.

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

Yes.

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

See response to bar-tailed godwit (*baueri*).

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?

No.

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.

See response to bar-tailed godwit (*baueri*).

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

See comment above for *L. l. menzbieri*. The new paper by Piersma et al is highly relevant to this assessment.

Piersma T, Lok T, Chen Y et al. (In Press) Simultaneous declines in summer survival of three shorebird species signals a flyway at risk *Journal of Applied Ecology*.

**Great Knot (*Calidris tenuirostris*)**

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. See response to bar-tailed godwit (*baueri*).

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

Yes. We do not know of any additional sources of information on the population size of this 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?*

Yes.

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., but see the new, highly relevant paper by Piersma et al. (In Press).

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, see response to bar-tailed godwit (*baueri*).

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

Unknown.

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

Yes.

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

Yes.

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

See response to bar-tailed godwit (*baueri*).

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?

See response to bar-tailed godwit (*baueri*).

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.

See response to bar-tailed godwit (*baueri*).

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

See comment above for *L. l. menzbieri*. The new paper by Piersma et al is highly relevant to this assessment.

Piersma T, Lok T, Chen Y et al. (In Press) Simultaneous declines in summer survival of three shorebird species signals a flyway at risk *Journal of Applied Ecology*.

**Lesser Sand Plover (*Charadrius mongolus*)**

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. See response to bar-tailed godwit (*baueri*).

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

Yes. We do not know of any additional sources of information on the population size of this 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?

NA

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.

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, but see response to bar-tailed godwit (*baueri*).

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

Unknown.

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

Yes.

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

Yes.

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

See response to bar-tailed godwit (*baueri*).

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?

See response to bar-tailed godwit (*baueri*).

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.*

See response to bar-tailed godwit (*baueri*).

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

We would be happy to discuss our submission and provide further detailed information, references and contacts if required.

**Greater Sand Plover (*Charadrius leschenaultii*)**

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, see response to bar-tailed godwit (*baueri*).

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

Yes. We do not know of any additional sources of information on the population size of this 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?

NA

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.

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, but see response to bar-tailed godwit (*baueri*).

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

Unknown.

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

Yes.

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

Yes.

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

See response to bar-tailed godwit (*baueri*).

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?

See response to bar-tailed godwit (*baueri*).

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.

See response to bar-tailed godwit (*baueri*).

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

We would be happy to discuss our submission and provide further detailed information, references and contacts if required.



## References

- Amano, T., T. Szekely, K. Koyama, H. Amano, and W. J. Sutherland. 2010. A framework for monitoring the status of populations: An example from wader populations in the East Asian-Australasian flyway. *Biological Conservation* **143**:2238-2247.
- An, S. Q., H. B. Li, B. H. Guan, C. F. Zhou, Z. S. Wang, Z. F. Deng, Y. B. Zhi, Y. H. Liu, C. Xu, S. B. Fang, J. H. Jiang, and H. L. Li. 2007. China's natural wetlands: past problems, current status, and future challenges. *Ambio* **36**:335-342.
- Avis, C. A., A. J. Weaver, and K. J. Meissner. 2011. Reduction in areal extent of high-latitude wetlands in response to permafrost thaw. *Nature Geoscience* **4**:444-448.
- Barter, M. A. 2002. *Shorebirds of the Yellow Sea: Importance, threats and conservation status.*, Canberra, Australia.
- Battley, P. F., N. Warnock, T. L. Tibbitts, R. E. Gill, T. Piersma, C. J. Hassell, D. C. Douglas, D. M. Mulcahy, B. D. Gartell, R. Schuckard, D. S. Melville, and A. C. Riegen. 2012. Contrasting extreme long-distance migration patterns in bar-tailed godwits *Limosa lapponica*. *Journal of Avian Biology* **43**:21-32.
- Conklin, J. R., P. F. Battley, M. A. Potter, and J. W. Fox. 2010. Breeding latitude drives individual schedules in a trans-hemispheric migrant bird. *Nature Communications* **1**:67.
- Gill, J., R. Langston, J. Alves, P. Atkinson, P. Bocher, N. C. Vieira, N. Crockford, G. Gélinaud, N. Groen, and T. Gunnarsson. 2007. Contrasting trends in two Black-tailed Godwit populations: a review of causes and recommendations. *Bulletin of the Wader Study Group* **114**:43-50.
- Gill, J. A., J. A. Alves, W. J. Sutherland, G. F. Appleton, P. M. Potts, and T. G. Gunnarsson. 2014. Why is timing of bird migration advancing when individuals are not? *Proceedings of the Royal Society B: Biological Sciences* **281**:20132161.
- Gill, R. E., T. L. Tibbitts, D. C. Douglas, C. M. Handel, D. M. Mulcahy, J. C. Gottschalck, N. Warnock, B. J. McCaffery, P. F. Battley, and T. Piersma. 2009. Extreme endurance flights by landbirds crossing the Pacific Ocean: ecological corridor rather than barrier? *Proceedings of the Royal Society B-Biological Sciences* **276**:447-458.
- Hong-Yan Yang, Bing Chen, Mark Barter, Theunis Piersma, Chun-fa Zhou, Feng-shang Li, and Z.-w. Zhang. 2011. Impacts of tidal land reclamation in Bohai Bay, China: ongoing losses of critical Yellow Sea waterbird staging and wintering sites. *Bird Conservation International* **In press**.
- Iwamura, T., H. P. Possingham, I. Chadès, C. Minton, N. J. Murray, D. I. Rogers, E. A. Treml, and R. A. Fuller. 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.
- Keesing, J. K., D. Liu, P. Fearn, and R. Garcia. 2011. Inter- and intra-annual patterns of *Ulva prolifera* green tides in the Yellow Sea during 2007–2009, their origin and relationship to the expansion of coastal seaweed aquaculture in China. *Marine Pollution Bulletin* **62**:1169-1182.
- Ma, Z., D. S. Melville, J. Liu, Y. Chen, H. Yang, W. Ren, Z. Zhang, T. Piersma, and B. Li. 2014. Rethinking China's new great wall. *Science* **346**:912-914.
- MacKinnon, J., Y. I. Verkuil, and N. J. Murray. 2012. IUCN situation analysis on East and Southeast Asian intertidal habitats, with particular reference to the Yellow Sea (including the Bohai Sea). IUCN, Gland, Switzerland and Cambridge, UK.
- Murray, N. J., R. S. Clemens, S. R. Phinn, H. P. Possingham, and R. A. Fuller. 2014. Tracking the rapid loss of tidal wetlands in the Yellow Sea. *Frontiers in Ecology and the Environment* **12**:267-272.
- Murray, N. J., and R. A. Fuller. 2015. Protecting stopover habitat for migratory shorebirds in East Asia. *Journal of Ornithology*:1-9.

- Murray, N. J., Z. Ma, and R. A. Fuller. 2015. Tidal flats of the Yellow Sea: A review of ecosystem status and anthropogenic threats. *Austral Ecology* **40**:472-481.
- Piersma, T., T. Lok, Y. Chen, C. Hassell, H. Yang, A. Boyle, M. Slaymaker, Y. Chan, D. S. Melville, Z. Zhang, and Z. Ma. In Press. Simultaneous declines in summer survival of three shorebird species signals a flyway at risk *Journal of Applied Ecology*.
- Seto, K. C., B. Güneralp, and L. R. Hutyrá. 2012. Global forecasts of urban expansion to 2030 and direct impacts on biodiversity and carbon pools. *Proceedings of the National Academy of Sciences* **109**:16083-16088.
- Smith, L., Y. Sheng, G. MacDonald, and L. Hinzman. 2005. Disappearing arctic lakes. *Science* **308**:1429-1429.
- Sutherland, W. J., J. A. Alves, T. Amano, C. H. Chang, N. C. Davidson, C. Max Finlayson, J. A. Gill, R. E. Gill, P. M. González, T. G. Gunnarsson, D. Kleijn, C. J. Spray, T. Székely, and D. B. A. Thompson. 2012. A horizon scanning assessment of current and potential future threats to migratory shorebirds. *Ibis* **154**:663-679.
- West, A. D., M. G. Yates, S. McGroarty, and R. A. Stillman. 2007. Predicting site quality for shorebird communities: A case study on the Wash embayment, UK. *Ecological Modelling* **202**:527-539.
- Wilcove, D. S., and M. Wikelski. 2008. Going, Going, Gone: Is Animal Migration Disappearing? *PLoS Biol* **6**:e188.
- Wilson, H. B., B. E. Kendall, R. A. Fuller, D. A. Milton, and H. P. Possingham. 2011. Analyzing Variability and the Rate of Decline of Migratory Shorebirds in Moreton Bay, Australia. *Conservation Biology* **25**:758-766.
- Wilson, J. R., S. Nebel, and C. D. T. Minton. 2007. Migration ecology and morphometrics of two Bar-tailed Godwit populations in Australia. *Emu* **107**:262-274.