



To:
FAO Mrs D Haywood
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[Redacted]
Global Flyway Ecology
Groningen Institute for Evolutionary Life
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Gaast 21 January 2020

Dear Mrs. Haywood,

With this letter I want to express my concerns over the proposed development at the Land East of College Road, Campdown, Purbrook, Waterlookville.

The Global Flyway Network (GFN) has been made aware of the development and I am concerned over the loss of habitat for wintering waders and brent geese. The proposed mitigation plan to compensate for this loss seem insufficient. The area proposed is not adequate enough to mitigate the impacts arising from the proposed development

FYI I have also read the excellent and informed criticism by RSPB and support their conclusions. on the qualifying species using the land around the special Protection Areas of Chichester and Langstone Harbours.

The Global Flyway Network (GFN) therefore **objects** to the proposals for proposed housing development by Campdown, Crookhorn, Havant, planning application APP/19/01101.

I am making this objection based on our knowledge of the importance of SPA sites for maintaining wintering bird populations this area is used by Dutch, German, Belgium, Polish, Swedish & Finnish breeding populations, and therefore in the SPAs of concern to this proposal come from populations have a crucial flyway function.

Our science has shown many times now that the loss of wintering habitat will lead, on a one to one basis, to the loss of breeding birds. I attach a publication in which we summarized this knowledge for the case of planned wetland losses in China. The Chinese have revised their plan; we hope you do too.

Yours sincerely,

[Redacted Signature]

Global Flyway Network

Forum provides a platform for contributions from the wider community reporting particular aspects of wader/shorebird ecology and conservation, as well as previously unknown topics. These articles are subject to editor-only review. If you are interested in contributing to Forum, please contact the Editors-in-Chief at: editor@waderstudygroup.org.

Loss of habitat leads to loss of birds: reflections on the Jiangsu, China, coastal development plans

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Prompted by the realization that parts of the coast of southern Jiangsu Province, China, are under threat of reclamation, we here summarize evidence that loss of intertidal habitats around the Yellow Sea and at other parts along the Chinese and Korean coasts has already led to severe population declines of migratory shorebirds, including multiple endangered species. All the evidence currently at hand suggest that the plans to reclaim (develop) additional intertidal habitat in this region poses a substantial threat to the remaining shorebird populations. We recommend that new Environmental Impact Assessments are warranted before further reductions in the extent of mudflats take place.

Mudflats take time and effort to appreciate. Watching shorebirds of various shapes and sizes across the mudflats at low tide, birds that gather in impressive flocks when driven towards the boundaries of land and sea at high tide, helps people to acquire that appreciation (van de Kam *et al.* 2016). Yet, when they are seen wheeling in the airspace above coastal mudflats as they try to evade a hunting falcon, or when in some seasons they forage scattered thinly across vast mudflats, but are absent at other times of year, it is easy to get the impression that the loss of these mudflats would be inconsequential to the birds, as they are continuously on the move. Many people seem to believe that shorebirds using a particular site can simply move on to another if that site is developed, that they always have other places to go.

However, more than half a century of extensive dedicated

research on the regulation of migrating shorebird populations around the world (see summaries in Swennen 1976, Pitelka 1979, Evans *et al.* 1984, van de Kam *et al.* 2004 and citations below) has shown quite the opposite. Although hard to research, several landscape-scale experiments and before-and-after studies of the consequences of habitat loss have shown that coastal mudflats are filled to capacity (e.g. Burton *et al.* 2006, Kraan *et al.* 2009, Duriez *et al.* 2012). Hence, there is strong scientific evidence that shorebird populations are limited by the space and quality of particular coastal non-breeding areas; moreover, spatial limitation may even extend to the aggregate of all staging areas in an entire flyway (Piersma *et al.* 2016). Therefore, the loss of mudflats anywhere in a flyway will usually lead to a loss of the flyway's capacity to support shorebirds (Iwamura *et al.* 2013). So, generally the birds cannot simply 'go someplace else' without



Fig. 1. Schematic impression of the Yellow Sea as the main 'hub' in the East Asian-Australasian Flyway. (Prepared and provided by BirdLife International.)

negative survival consequences for them or for the birds already present there (Rakhimberdiev *et al.* 2015, Piersma *et al.* 2016).

Perhaps this should not come as a surprise. Breeding over extensive northern tundra and taiga habitat (Lappo *et al.* 2012), the shorebirds populating the coastal habitats around the world during the migration and winter seasons squeeze into narrow coastal areas that are 2–3 orders of magnitude smaller than the breeding areas. Not only are wetlands generally uncommon, and coastal wetlands in particular rare and small in extent (exacerbated by modern man's requirement for hard developed coastlines worldwide), the extent of wetland area is estimated to have reduced by 87% since the year 1700 (Davidson 2014). The long-term consequences for migrating shorebird populations, for which known causes of changes in population size are found mainly outside their remote Arctic breeding areas (Meltote 2013), can only be guessed, as comprehensive counts of their numbers on the coastal non-breeding grounds began no earlier than the 1960s (e.g. Smit & Wolff 1980, Prater 1981, Veitch & Habraken 1999).

The recognition that migrating shorebirds, and indeed other waterbirds, represent an internationally shared resource that is worth conserving, has led to several international agreements and appellations (e.g. Boere *et al.*

2006). This includes coastal areas being designated as Ramsar sites, Important Bird Areas, Man and Biosphere Reserves, World Heritage Sites, and Important Flyway Sites by the East Asian-Australasian Flyway Partnership. Some of these accolades offer various levels of legal protection under national and international frameworks (Boere & Piersma 2012). In view of the fact that the coastal intertidal areas of east Asia, particularly those in China and around the rest of the Yellow Sea, currently represent the largest global concern for safeguarding migrating shorebirds (e.g. Barter 2002, van de Kam *et al.* 2010, MacKinnon *et al.* 2012, Conklin *et al.* 2014, Ma *et al.* 2014, Xia *et al.* 2016; Fig. 1), it is heartening to see that the Government of China has taken steps towards formally protecting some of its key coastal areas as World Heritage Sites (<http://whc.unesco.org/en/tentativelists/6189/>). Nevertheless, many areas are still listed for reclamation. This *Forum* contribution was prompted by the realization that some of the intertidal habitats along the coastline of Jiangsu Province, including the offshore Dongsha Shoals (see Fig. 3), are still scheduled to be reclaimed. And, from the shorebirds' perspective, reclamation equals destruction. We believe that these areas are likely to be hugely important from an ecological perspective. Let us explain.

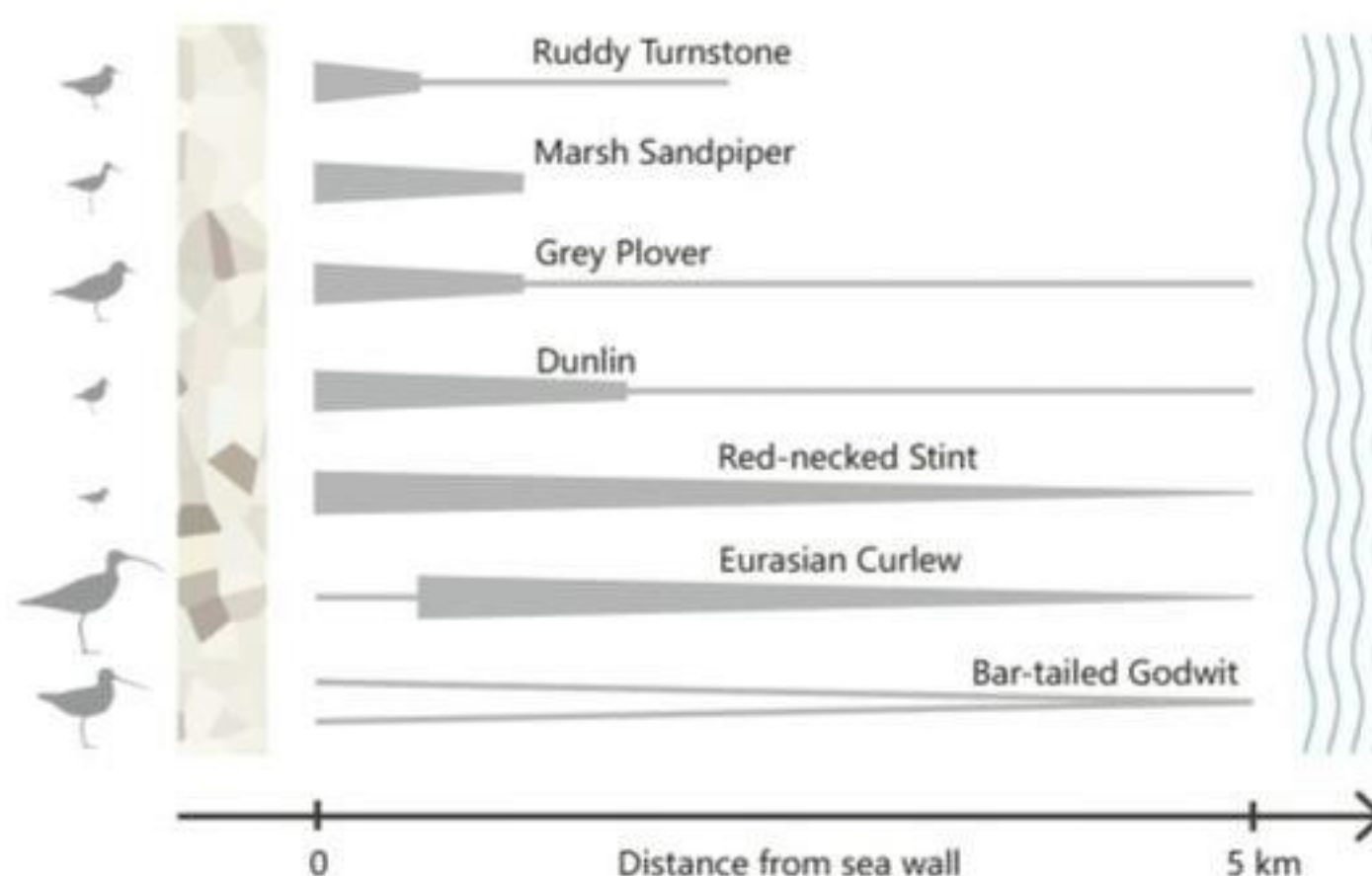


Fig. 2. A schematic view of the feeding shorebird distribution on the Yangkou intertidal muddy foreshore. Between high tide mark (bounded by sea wall in this area) and low tide line, species like Ruddy Turnstones *Arenaria interpres* and Dunlins *Calidris alpina* usually feed intensively in the upper zone ('zone specialists'), Red-necked Stints *Calidris ruficollis* and Eurasian Curlews *Numenius arquata* spread out across the whole stretch of mudflat ('zone generalists'), while Bar-tailed Godwits *Limosa lapponica* are usually seen feeding close to the water line ('tide-followers'). The thickness of the lines represents the relative accumulated number of feeding birds in the course of the tidal cycles. (Based on T. Mu & D.S. Wilcove in prep.)

Over the last decade, studies using ringing recoveries of all shorebird species (e.g. Iwamura *et al.* 2013), and the tagging of several species with satellite transmitters and geolocators (e.g. Gill *et al.* 2009, Battley *et al.* 2012, Minton *et al.* 2011, Lisovski *et al.* 2016a, 2016b), have established the key roles of the Yellow Sea and more southerly Chinese coastal areas as shorebird refueling areas during both northward and southward migration (Fig. 1). In addition, a series of recent analyses of shorebird count data has demonstrated overwhelmingly that the species that rely to the greatest extent on the Yellow Sea have shown the steepest population declines (Amano *et al.* 2010, Wilson *et al.* 2011, Clemens *et al.* 2016, Studds *et al.* 2017), suggesting that the cause is the shrinking coastal habitats of the Yellow Sea.

In addition, detailed demographic studies of the Red Knots *Calidris canutus*, Great Knots *Calidris tenuirostris* and Bar-tailed Godwits *Limosa lapponica* that spend the non-breeding season in Australia (Piersma *et al.* 2016) and of Bar-tailed Godwits from New Zealand (Conklin *et al.* 2016), show these three species have each experienced similar declines in survival during the period of the year when they migrate to the Arctic and return. This 'coincidence' can only be explained by their shared use of the Yellow Sea intertidal zones during the critical refuelling phases. Although they use quite different parts of the Yellow Sea coastline, the fact that they are so similarly affected is consistent with coastal wetlands being lost

rapidly along all the coasts of China and the Koreas (Yang *et al.* 2011, Ma *et al.* 2014, Murray *et al.* 2014, 2015, Wang *et al.* 2014, Piersma *et al.* 2016). Note that the mortality of these birds does not have to occur on the Asian staging sites; it could take effect as delayed, downstream carry-overs from inadequate refuelling in the Yellow Sea (Baker *et al.* 2004, Senner *et al.* 2015): undernourished birds being unable to survive the migrations to and from their Arctic breeding grounds.

One of the geomorphologically amazing (Chen *et al.* 2017), globally unique, yet ecologically very poorly studied coastal areas in China, is the complex of intertidal habitats along the Dafeng-Dongtai-Rudong coastline in southern Jiangsu Province, a complex that includes the Tiaozini mudflats along the mainland coast and the offshore Dongsha Shoals (32.4–33.4°N, 120.7–121.5°E; Kang *et al.* 2017; Xiong *et al.* 2017, see Fig. 3). Peng *et al.* (2017) summarized the importance of the intertidal areas along the mainland coast for migrating shorebirds and found this area to be the most important in the world during both north- and southward migration for Spoon-billed Sandpipers *Calidris pygmaea* (a 'Critically Endangered' species according to both the IUCN Red List of Threatened Species, Version 2017-1, www.iucnredlist.org, and China's Red List, Jiang *et al.* 2016) and Spotted (or Nordmann's) Greenshanks *Tringa guttifer* ('Endangered').

Work carried out in September–October 2016 by T. Mu and D.S. Wilcove on the spatial and temporal distribution

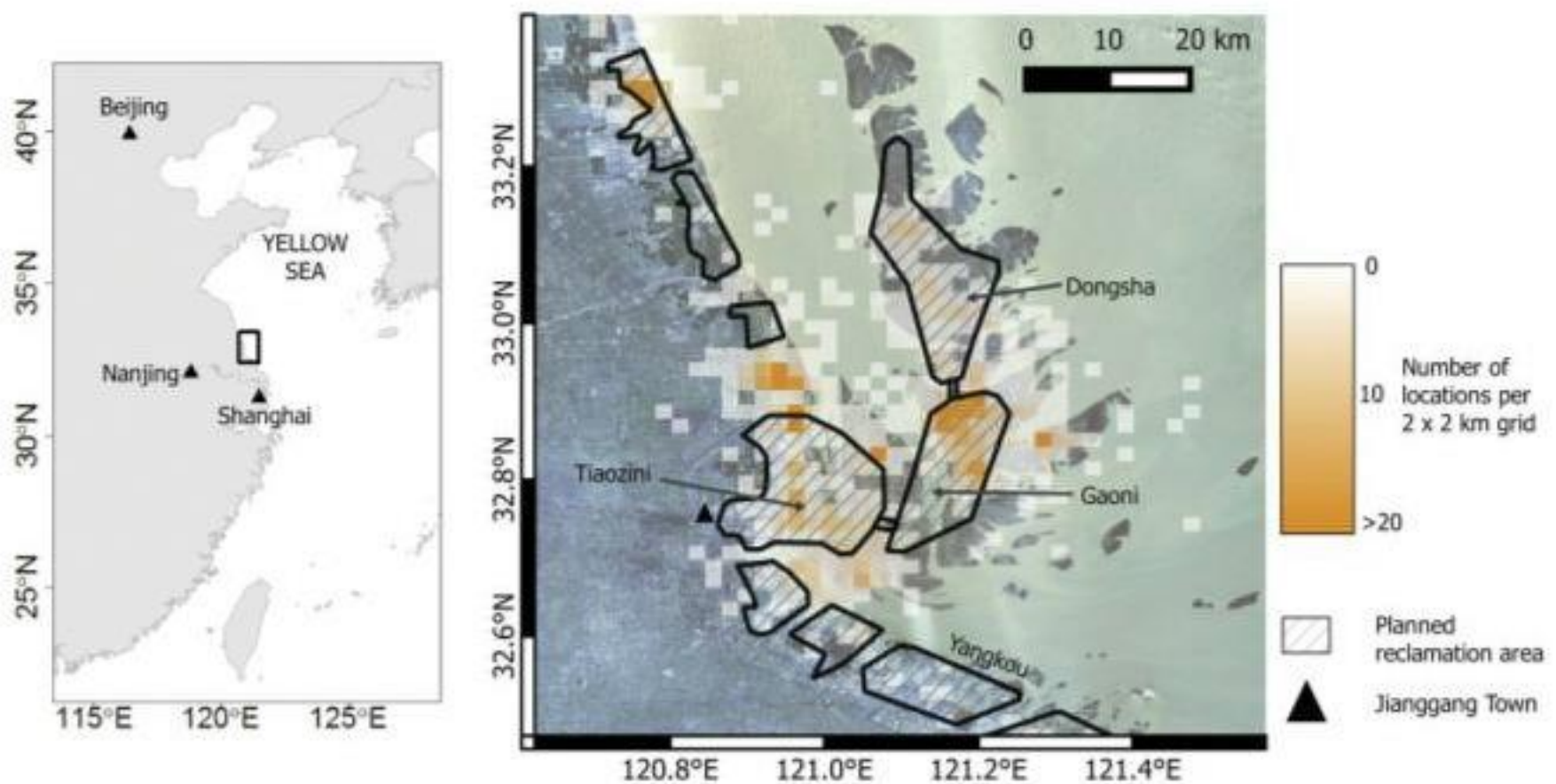


Fig. 3. Situation of the southern Jiangsu Province Tiaozini-Dongsha Shoals tidal flats north of Rudong (left) and the reclamation plans in this area for 2010–2020 (according to Zhang *et al.* 2011, the intertidal areas indicated in grey) combined with the density distribution of 15 staging, satellite-tagged female Bar-tailed Godwits in May 2015–July 2017 (right). White to orange coloured squares represent the number of locations of godwits in a 2 x 2 km area, obtained from Argos satellite tracking. A lack of grid squares indicates a lack of satellite locations, but of course does not mean that such areas were not visited by shorebirds. (Based on Y.-C. Chan, T.L. Tibbitts, T. Piersma *et al.* in prep.)

of different shorebird species feeding on the mudflat of the Yangkou foreshore at Rudong, showed that species with different feeding modes (i.e. generalists, zone specialists, and tide followers) have different vulnerabilities to environmental change (Fig. 2). Along this segment of the mainland coast, the upper intertidal zone provided disproportionately the largest feeding opportunities to most species (Fig. 2), yet it is also the area most vulnerable to land reclamation (Zhang *et al.* 2004). In fact, over the last decade, during the first phase of the coastal development programme in Jiangsu Province, 6,750 ha of the upper shore habitat at Tiaozini was converted before the consequences for migrating shorebirds and other forms of biodiversity could be assessed. The infrastructural works are likely to have negatively impacted shorebirds, including Spoon-billed Sandpipers and Spotted Greenshanks.

The importance of the offshore Dongsha Shoals to shorebirds remained largely unknown until satellite-tracking work by Global Flyway Network in 2014–2017. This work showed that the Tiaozini mudflats and Dongsha Shoals were used by no fewer than 15 of 35 (43%) tagged female Bar-tailed Godwits of the *menzbieri* population for several weeks during both northward and southward migration (Fig. 3). Based on a total population of about 146,000 birds (Wetlands International 2017), and assuming that the tagged birds are representative of this population, the Dongsha Shoals would provide critical staging habitat for at least $0.43 \times 146,000 \approx 63,000$ northward migrating Bar-tailed Godwits. This large number does not include

the equally numerous, and equally declining, *baueri* population, which stages in this area during northward migration (Battley *et al.* 2012, Conklin *et al.* 2016). Rather alarmingly, 52% of locations of tagged Bar-tailed Godwits using the Dafeng-Dongtai-Rudong coastline fell within the proposed reclamation areas (Fig. 3). Note that there are additional reports of a satellite-tracked Spotted Greenshank (tagged in Thailand; Yu & Gale 2017, pers. comm.) and Grey Plovers *Pluvialis squatarola* (tagged in South Australia; <http://www.vwsg.org.au/GP2016-news.html>, M. Christie pers. comm.) using the Dongsha Shoals. This area is clearly crucial habitat for many species of shorebirds.

Consequently, there is a lot to be lost if the reclamation plans of the Jiangsu Government are carried out as currently planned (Zhang *et al.* 2011). The world will lose one of its most ecologically important intertidal zones. Also, the loss of this area will harm populations of multiple rare species of shorebirds, some of which are already close to extinction.

All available evidence shows that the migrant shorebirds of the East Asian-Australasian Flyway need every hectare that remains of their East Asian intertidal staging areas during north- and southbound migration. Further land claims will threaten their long-term prospects. Clearly, before going ahead with any further reductions in the extent of the Tiaozini mudflats and the Dongsha Shoals, new and thorough Environmental Impact Assessments are warranted.

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