

Opportunities and challenges for the development of flyway-wide shorebird indicators

Tatsuya Amano¹

1 School of Biological Sciences, University of Queensland, Brisbane, Australia

*Tatsuya Anano, t.amano@uq.edu.au

Bird population indicators have been playing a critical role in informing scientific communities, decision-makers and the wider public about the status of biodiversity. To develop such indicators, however, we need to address various challenges, ranging from field surveys, data management and statistical analysis to dissemination. Failure at any stage of these processes could lead to misinformed decision-making based on unreliable indicators. In this presentation I will aim to summarise the opportunities and challenges for the development of shorebird indicators in the East Asian-Australian Flyway. I will first propose a framework for collecting data, developing indicators and informing decision-making. Then I will list the potential challenges in each of the processes, including (but not limited to) standardising survey methods, mobilizing and maintaining survey efforts, developing a system for centralising data, establishing statistical approaches, and identifying a mechanism for integrating developed indicators into the decision-making processes. The ultimate goal of this presentation is to start up a discussion among the speakers and audience on the proposed framework and challenges, and pave the way for the development and implementation of effective indicators.

Theme: Monitoring

Preferred option: Oral Presentation

Waterbird abundance changes at China coastal sites from 2008 to 2017

Nga-Yee Lai¹, Tatsuya Amano^{2,3}, China Coastal Waterbird Census Group,
Nicholas Murray⁴, Jennifer Gill¹

¹ School of Biological Sciences, University of East Anglia, Norwich, UK

² Conservation Science Group, Department of Zoology, University of Cambridge, Cambridge, UK

³ School of Biological Sciences, The University of Queensland, Brisbane, Australia

⁴ Centre for Ecosystem Science, University of New South Wales, Sydney, Australia

*Nga-Yee Lai, laingayee@gmail.com

Coastal development is a major threat to coastal waterbird species around the world; the large-scale coastal reclamation along the China coast and in the Yellow Sea Area is believed to be the main reason for recent declines in populations of waders and other waterbirds of the East Asian-Australasian Flyway (EAAF): the flyway with the highest number and abundance of threatened wader species of the four global waterbird migratory flyways. However, there is limited direct evidence of the relationship between tidal flat loss and waterbird abundance change along the China coast.

Using waterbird survey data collected by China Coastal Waterbird Census Group and remote sensing data on tidal flat area, I quantified the abundance change of 90 waterbird species and 9 species group between 2008 and 2017 at six coastal wetland sites along the China coast and estimated the rate of abundance change of each species. The relationship between the abundance changes at each site was tested with the percentage loss of tidal flat within 10km radius of each survey site between 2007 and 2016, which was estimated using remote sensing technique. Lastly, I tested the associations of the rate of abundance change of the 90 species using four species characteristics: mudflat-dependence, migratory status, body mass and breeding/resident range.

The rate of abundance changes of the 90 species studied varies between species and sites. All wader species combined, and in four species individually (Eurasian Curlew *Numenius arquata*, Kentish Plover *Charadrius alexandrinus*, Red Knot *Calidris canutus* and Whimbrel *Numenius phaeopus*), had greater rates of abundance decline in sites with more tidal flat loss between 2007 and 2016. Wintering mud-flat dependent species, non-mudflat dependent passage migrant species and species with smaller body sizes had the greatest abundance declines.

These results suggest that tidal flat loss on these key sites along the flyway appears to be linked to local abundance changes in several wader species and may therefore be contributing to the overall population declines of these species. Coastal protection in China is therefore crucial for conserving these waterbirds in China and EAAF, and the recent act of Chinese government toward coastal protection is an important step to stop the decline of the coastal waterbirds in EAAF.

Theme: Monitoring

Preferred option: Oral Presentation

Filling in the data gaps for migratory waterbirds in the East Asian-Australasia Flyway

Da-Li Lin^{1,2*}, An-Yu Chang¹, Allen Lyu³, Scott Pursner³, Yong-Lun Lin¹, Kun-Hai Lin⁴, Kung-Kuo Chiang⁵, Ruey-Shing Lin¹, Tatsuya Amano², Richard A. Fuller²

1 Endemic Species Research Institute, Council of Agriculture, Executive Yuan

2 School of Biological Sciences, The University of Queensland

3 Chinese Wild Bird Federation

4 Kaohsiung Wild Bird Society

5 Wild Bird Society of Taipei

*Da-Li Lin, thrush1250@gmail.com

Many species of migratory waterbirds which use the East-Asian Australasian Flyway have seen rapid population declines in recent years. However, because of the difficulty in collecting data in many parts of the region, it is difficult to find the causes for such declines. Therefore, it is necessary and urgent to launch monitoring programmes in order to fill in these data gaps. Taiwan is one of the most important stopover and wintering sites for migratory waterbirds along the EAAF. The Taiwan New Year Bird Count was launched in 2014 as a citizen science project to monitor the status and population trends for the wintering avifauna of Taiwan and its outlying islands. During the event, volunteer teams choose a date in late December or early January to survey for birds in circle sample areas whose radius are three kilometers. Organizers also ensure that all wetland hotspots are covered by the survey. In 2019, 1,365 participants observed 325 species from 312,948 individuals in 179 sample areas and accumulated 15,388 records. The datasets created from the results provide a highly synchronous spatial-temporal distribution map of Taiwan's wintering birds. This information is later shared with the International Waterbird Census to fill data gaps for species. Notably, the populations of Kentish Plover, Common Greenshank, and Long-toed Stint showed significant decreases from 2014 to 2019. During that same period, the loss of rice paddies may have contributed to the sharp decrease in the number of shorebirds which prefer freshwater wetland habitat in northeastern Taiwan. In conclusion, we suggest that launching a citizen science programme based on local networks, especially wild bird societies, is one of the most effective methods for filling in the data gaps regarding migratory species. The data collected can be used by scientists and policymakers to properly assess population trends and develop conservation goals and strategies.

Theme: Monitoring

Preferred option: Oral Presentation

Example:

Movement patterns of Arctic-breeding shorebirds during post-breeding and southbound migration

Richard B. Lanctot¹, Sarah Saalfeld¹, and Daniel Ruthrauff²

1 Migratory Bird Management, U.S. Fish and Wildlife Service

2 Alaska Science Center, U.S. Geological Survey

*Richard B. Lanctot, richard_lanctot@fws.gov

Shorebirds use coastal regions of the Arctic during post-breeding to acquire resources to migrate. Limited information is available on the inter-connectedness of breeding and stopover sites, as well as residency time and movements among stopover sites. Such information is needed to understand effects of climate change and development.

We deployed tracking devices on four shorebird species breeding at four sites in Alaska (Utqiagvik, Colville River, Prudhoe Bay, and Canning River) and one site in Canada (Cambridge Bay, Nunavut). In 2017, we deployed 1.2 g GPS archival tags on 57 Dunlin and 68 Semipalmated Sandpipers. In 2018, we deployed 4–5 g GPS satellite tags on 15 Pectoral Sandpipers and 13 American Golden-Plovers. All tracking devices were programmed to collect one GPS location every one to two days during southbound migration to wintering areas. Tags from 6 Dunlin and 1 Semipalmated Sandpiper were recovered a year later from three sites in Alaska. Dunlin relied on areas in northwestern Alaska much more than expected; prior information suggested all birds went to the Yukon Delta in western Alaska to stage. American Golden-Plovers and Pectoral Sandpipers moved east across Canada relying on several key sites in Nunavut (Victoria Island, Dewey Soper Migratory Bird Sanctuary) to stage for 1-2 weeks. Plovers continue to travel east crossing over the Atlantic Ocean to reach South America whereas Pectoral Sandpipers stayed within the Continental United States as they went south. We will provide more details on bird use of the Arctic Coast of Alaska and proposed oil development.

Theme: migration ecology

Preferred Option: Oral Presentation

Towards the development of the East Asian–Australasian Flyway shorebird indicators

Recent shorebird declines in Japan

Toshifumi Moriya¹ & Tatsuya Amano²

1 Japan Bird Research Association, Tokyo, Japan

2 School of Biological Sciences, University of Queensland, Brisbane, Australia

* Toshifumi Moriya, moriya@bird-research.jp

Since the 1970s, NGOs in Japan have been conducting monitoring surveys of shorebirds throughout the country. Since the winter of 1999, the project has been carried out by the Ministry of the Environment as a citizen science project called "Monitoring site 1000". The survey is conducted at approximately 150 sites across the country during spring migration, autumn migration, and wintering season, and the maximum number of individuals for each species during multiple surveys within a season is recorded. Currently, most shorebird populations in Japan are generally declining. In the early stages of the survey, reclamation and other developments were actively carried out mainly in coastal areas near large cities, and the consequent decrease in tidal flats and other habitats is considered to explain shorebird declines. However, even after 2000, when large-scale development decreased, shorebirds have still been decreasing in Japan. The declining trend includes species most commonly observed in tidal flats such as Dunlin, species that breed on sandy beaches such as Kentish Plover, and species that winter in paddy fields such as Common snipe. This presentation reports population trends of shorebirds in Japan based on the survey from 1975 to 2017, and describes habitat requirements and other species characteristics associated with declining trends.

Theme: Monitoring

Preferred Option: Oral Presentation

Shorebird population changes at stopover sites in the Yellow Sea

Xiaodan Wang¹, Ying Chen¹, David S Melville², and Zhijun Ma¹

1 Ministry of Education Key Laboratory for Biodiversity Science and Ecological Engineering, Coastal Ecosystems Research Station of the Yangtze River Estuary, Fudan University, Shanghai, 200433, China.

2 Global Flyway Network, 1261 Dovedale Road, RD 2 Wakefield, Nelson 7096, New Zealand.

*Xiaodan Wang, xiaodanfudan@126.com

Many shorebirds in the East Asian-Australasian Flyway have suffered rapid population decline. This is mainly due to habitat loss at key stopover sites in the Yellow Sea. However, the evidences for shorebird population decline mainly came from nonbreeding sites. Shorebird population changes in the Yellow Sea are still largely unexplored. Here we compared shorebird population changes at key stopover sites in the Yellow Sea at different periods, analyzed the spatial differences of population changes and their relationship with habitat condition. We found population changes varied among species and are not consistent among stopover sites. We highlighted the importance of high-quality refueling sites for population maintenance of migratory shorebirds.

Theme: migration ecology

Preferred Option: Oral Presentation