

The Yellow Sea – a race against time

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Recent studies have established the Yellow Sea, between the Korean peninsula and the Chinese east coast north of Shanghai, as by far the most important northward migration staging area for waders along the East Asian–Australasian Flyway. Unfortunately many of the most significant sites are threatened. There is an urgent need for further research and conservation action.

THE CHALLENGE

Until recently, the major unsolved problem in the East Asian–Australasian Flyway has been identification of the important staging areas used during northward migration by the estimated 5,000,000 migratory waders of 60 species in the region. We knew a good deal about the distribution of waders in the non-breeding season and broadly where they breed, but very little about where they stage in large numbers during migration.

This issue is particularly acute in our flyway because it contains more than a third of the world's human population living in 24 countries, many of which are among the fastest growing economies in the world, with a seemingly insatiable appetite for land and resources. All this is not good news for wetlands, with the intertidal areas of east Asia being amongst the most threatened globally (Melville 1997).

We thought that a visit during the 1996 northward migration to Chongming Dao, a large island in the Yangtze estuary, might begin providing answers. Many Australian bands had been recovered there and the indications were that the extensive intertidal areas at the eastern end of the island supported very large numbers of waders. Not so! It seems that the area rarely holds more than 15,000 waders at peak times. We were beginning to realise the limitations of relying on band recoveries and flag sightings to identify key staging areas. Band recoveries are good at locating hunting activity and flag-sightings at pin-pointing affluent telescope-owning birdwatchers, but they can be misleading when trying to find important migration sites.

So, we were little wiser, other than that we had learnt the important lesson that there is no substitute for on-ground surveys to locate important staging areas.

A FORTUNATE COINCIDENCE

In the mid-1990s, Jim Wilson, a renowned wader buff, arrived in Australia accompanying his wife, a Norwegian diplomat. Jim, with time on his hands, immediately began asking what he could do to help. He has a long history of studying birds on migration and has been involved in a number of expeditionary activities in the East Atlantic Flyway.

One of the tasks Jim undertook was a desk study in an attempt to identify potentially fruitful areas to search for the missing migrants – particularly “long jumpers” such as Great Knot *Calidris tenuirostris*, Red Knot *C. canutus* and Bar-

tailed Godwit *Limosa lapponica*. From an investigation of data on departure and arrival times, population sizes, counts, leg-flag sightings and band recoveries of these three species in the Yellow Sea, Japan and Sea of Okhotsk, he was able to show that there is a period of three to four weeks during northward migration when they “go missing”. After poring over maps in the National Library in Canberra, he decided that they were probably using the very extensive mudflats in the northern Yellow Sea during this time and suggested that these areas may be the final staging site before the birds reach the breeding grounds (Wilson & Barter 1998). (See Fig. 1 for more information about the location of the Yellow Sea).

But how could we get to these seemingly inaccessible areas?

THE SECOND COINCIDENCE

In 1997, Environment Australia commenced funding a training programme for staff at the Chinese Shorebird Network Sites aimed at giving Site staff the skills to study and manage waders using the local wetlands. This programme, organised by Wetlands International – China, and involving training in wader ecology, surveying, identification and counting, always finished with a complete count of the region thus providing the opportunity we needed to collect data in the northern Yellow Sea.

Starting at Chongming Dao, we worked our way around the Yellow Sea coast in a broadly clockwise direction to the border with North Korea – visiting five Chinese Shorebird Network Sites over the 1997–2000 period. As a nice touch, Jim Wilson joined us in two of these years. More recently, we have been surveying for waders at other promising locations on the Chinese side of the Yellow Sea.

THE OUTCOME

As predicted, we discovered enormous numbers of waders just about everywhere!

Based on the data collected by ourselves and the South Koreans in recent years, we estimate that 2,000,000 migratory waders use the Yellow Sea during northward migration (i.e. 40% of the Flyway total!) and about 1,000,000 during southward passage (many use a different route at this time).

So far we have discovered nine Megasites (i.e. >100,000 birds at any one time), but there will undoubtedly be more found in the future as only about 60% of the Chinese coastline has been covered so far, and none of the coast of North Korea.



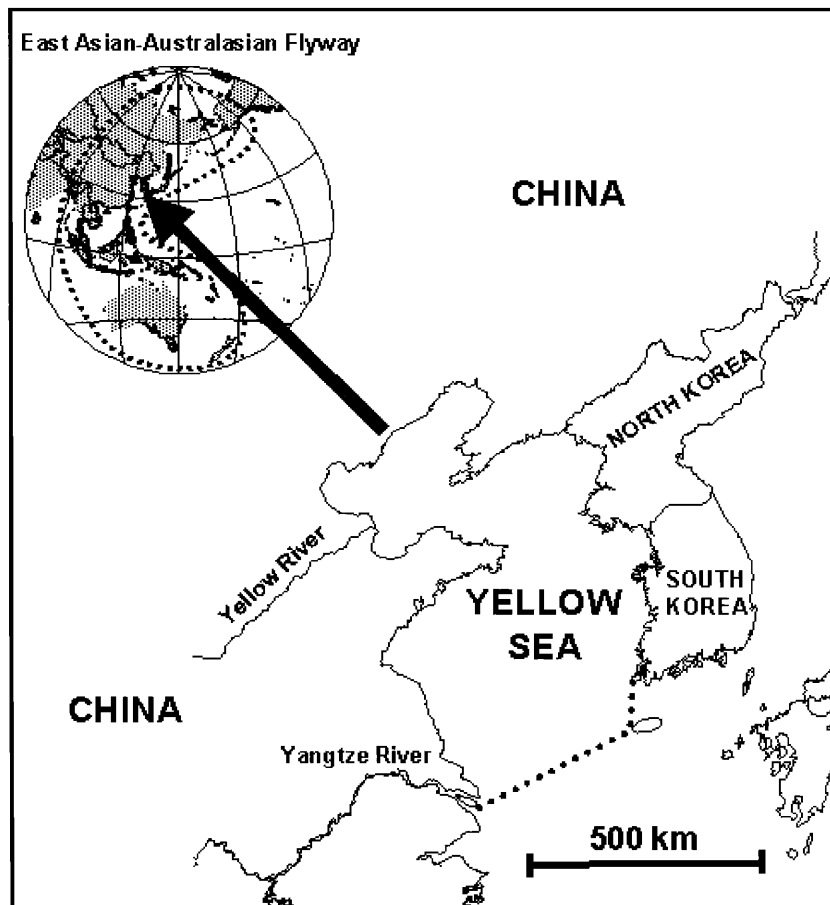


Fig. 1. Location of The Yellow Sea in the East Asian–Australasian Flyway.

At least 36 species (60% of the Flyway total) occur in internationally important numbers at one or more sites. To date, we have identified 27 internationally important sites.

The extreme importance of the Yellow Sea is demonstrated by the fact that it supports more than 30% of the estimated Flyway breeding populations of 18 wader species during northward migration; for six of these species the region carries almost the whole Flyway breeding population at this time.

The detailed results can be found in Barter (2002).

So, we have been successful in finding the single most important staging region in the East Asian–Australasian Flyway for migratory waders!

A SERIOUS PROBLEM

During our surveys we have also had the opportunity to assess threats to wader habitat and recently studies have been published on their magnitude (Moore *et al.* 2001, Yuan *et al.* 2001). There are many serious problems. Some of these are:

- loss, to date, of 40% of the intertidal areas existing in the mid-twentieth century, with another 43% planned for reclamation;
- the drying up of the Yellow River, the major sediment-source for the Yellow Sea, due to excessive water extraction for up-stream agriculture and industry;
- heavy pollution and numerous algal red tides;
- unsustainable harvesting of marine resources, including

shellfish; and

- significant human disturbance of feeding and roosting areas.

The deleterious effects of these threats can be expected to be especially acute on northward migration when waders are working to a very tight schedule, particularly as it is believed that most fly non-stop from the Yellow Sea to the breeding grounds.

UNFINISHED BUSINESS

Our main achievements, so far, are to identify the great importance of the region and the very significant threats to its continuing use by waders, but we need much more information if we are to secure the future of the Yellow Sea for waders. There is now an urgent need for researchers to move into the Yellow Sea to collect the data necessary to underpin effective conservation action.

Some important research topics are:

- provenance of the main species and populations passing through the Yellow Sea;
- understanding how different races use the Yellow Sea, e.g. *rogersi* and *piersmai* Red Knot, *menzbieri* and *baueri* Bar-tailed Godwit, *arctica*, *kistchinski* and *sakhalina* Dunlin, and the NE and NW Australia Great Knot populations;
- study of migration phenology and energetics; for some



species the Yellow Sea appears to be the only staging region between the non-breeding and breeding areas, thus providing a particularly good opportunity to study birds arriving after a long flight (up to 8,000 km) and preparing for the critical non-stop flight into the breeding grounds (up to 5,500 km);

- effects of significant habitat loss on a species, e.g. the South Korean bay which has had a one-day count of 86,000 Great Knot (30% of the breeding population) is currently being reclaimed and the dyke is due to close in 2006;
- studies of species, such as Kentish Plover, that breed in large numbers around the Yellow Sea coastline.

This is just a selection – there are many more potential topics!

ANYBODY INTERESTED?

What the Yellow Sea needs is a burst of expeditionary activity analogous to that which occurred in the 1970s and 1980s in the East Atlantic Flyway, when visits to Iceland, Norway, Greenland, Morocco and Mauritania led to a significant improvement in knowledge of how waders use that flyway.

There are some excellent study sites in both China and South Korea, with plenty of birds, good accessibility and reasonable accommodation. The challenge will be to find suitable research partners in those countries. Fortunately, there are a number of universities on both sides of the Yellow Sea that have been involved in, or have indicated an

interest in, studying waders. Other potential partners are Wetlands International – China and the National Bird Banding Centre of China. There are very active NGOs in South Korea and similar groups are starting up in China.

A very important objective of any joint activity must be the training of locals so that they can continue the good work.

Anybody interested in exploring opportunities should contact me and I will attempt to identify a way forward.

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