

# TIDAL FLATS TURNED INTO FATAL SHORES

The world's greatest travellers, migratory shorebirds, are threatened by coal ports and heavy industry.

Story by TIFFANY INGLIS and DANNY ROGERS

**The air is salty. The ocean rolls in and then gently retreats. Underfoot is soft sediment with the muted shimmer of a tin roof. A crab emerges, hovers at the edge of its hole. There seems to be little other life around.**

This is a tidal flat. And despite its sparse appearance and ethereal quiet, it is one of our planet's most productive ecosystems. Like rainforests and coral reefs, tidal flats support an exceptional diversity of wildlife.

Bristleworms, clams and crabs are some of the many species that live in tidal flats. Not always visible, they burrow deep into the sediment – a mix of sand, mud and nutrients, carried in by the sea and washed off the land.

These animals are specialised – they can

live only in tidal flats. When the tide is in, they are submerged and cool. They have a bewildering range of tentacles, siphons and claws to extract food from the water and sediment. When the tide is out, they need to bury themselves to avoid exposure to the air, the sun and foraging shorebirds.

In Australia, one such large and productive tidal flat is Roebuck Bay near Broome in Western Australia. Every day, the tide rises by up to nine metres and then slowly recedes to reveal a vast array of life.

But not all tidal flats are equally productive. It takes special conditions to create truly diverse tidal flats. Tidal areas such as Roebuck Bay have a good mix of sediments, suitable currents and flat topography. There are only a few areas like this in the world.

## Migratory shorebirds

Tidal flats provide a source of food for those with the tools to access it. Highly specialised birds travel immense distances to feed on the plethora of worms, clams and crustaceans. The distances travelled are amazing. They migrate each year from breeding grounds in the Arctic tundra to non-breeding grounds in Australia and New Zealand, where they moult, feed and rest before they head north again.

Migratory shorebirds, also called waders, may travel up to 26,000 km each year. Often the birds fly for days on end without stopping. Some of these birds weigh as little as 25 grams – a similar weight to two 50-cent coins.

To fly such long distances they need to build up huge fat reserves. Before their long



Provided they have tidal flats to forage on, shorebirds can make a living near large human populations. However there are plans to reclaim these tidal flats at Song Do, South Korea



migratory flights shorebirds feed frantically, almost doubling their weight. For many species, tidal flats are the only habitats that provide enough food. Over the non-breeding season, shorebirds forage widely on tidal flats with specialised bills. Great knots, sandpipers and plovers dig out the life hidden in the sediment. The birds are camouflaged and blend into the subdued coastal tones.

On the way to Australia and back, shorebirds stop on tidal flats in Southeast Asia, the Philippines, China, Korea and Japan and other countries. The route the birds take is known as the East-Asian Australasian Flyway (EAAF). This Flyway is made up of over 20 countries and is one of eight flyways around the world. Scientists have come to realise that tidal flats form the basis of an international shorebird 'super-highway'.

## A hub in the Yellow Sea

One of the main pit-stops for shorebirds along the Flyway is the Yellow Sea, a vast expanse of tidal flats between China and the Republic of Korea. It is used by at least one million birds as a staging site on their journey south and some two million individuals on the journey north. It is vital for their survival. If shorebirds are unable to rest and feed before the next section of their journey, they are likely to die en route.

***In China and the Republic of Korea, large-scale land reclamation projects have destroyed almost 50 per cent of tidal flats in the Yellow Sea, mostly in the past 30 years.***

In the Yellow Sea, people share tidal flats with shorebirds. Fishers use traditional methods to extract shell-fish. Simple tools, such as hoes, are used to dig the animals out, with little impact on shorebirds feeding nearby.

But the Yellow Sea tidal flats are under attack. Land reclamation has increased at a rapid rate. With nearly 45 per cent of the world's population living in the Flyway, land is a precious resource. To make new land, governments 'reclaim' tidal flats.

## Land reclamation is land destruction

Land reclamation is a misleading phrase. It is not the process of 'reclaiming' or bringing dry land back. Land reclamation is a change of habitats. Tidal flats are not land. They are



Red Knot – threatened by reclamation projects at Caoofedien, China

coastal areas that are part sea and part land. Reclamation changes tidal flats into dry land that is more suitable for human use. The conversion of tidal flats into land is no less destructive than clearing a rainforest or draining a wetland.

In China and the Republic of Korea, large-scale land reclamation projects have destroyed almost 50 per cent of tidal flats in the Yellow Sea, mostly in the past 30 years. Sea walls and dykes are built around tidal flats and filled in to extend the coastline. The newly made land is used for houses, factories and infrastructure, to develop industry, expand ports and create energy facilities, including wind farms.

Land reclamation of tidal flats in the Yellow Sea continues. In the Republic of Korea, the Government forecasts that by 2011 approximately 75 per cent of tidal flats will have been reclaimed. The situation in China is no better.

The impact this has had on shorebirds is immense. Of 54 migratory shorebird species that use the Flyway regularly, about 30 are dependent on tidal flats at some time. And of those species that occur in Australia, five are now classed as threatened (under the national Environment Protection and Biodiversity Conservation Act 1999). At least nine other species are in decline. Land reclamation destroys the habitat of migratory shorebirds.

## Shorebird studies

In Australia, the Australasian Wader Studies Group (AWSG), a part of Birds Australia, carries out population counts of shorebirds on a regular basis. Since the early 1980's the group has collected data on the numbers of migratory shorebirds that visit Australia. The data set is now long enough to

reveal strong trends.

For 25 years, the AWSG has closely monitored the population sizes of seven migratory shorebird species. It is now clear that significant declines have occurred in four of these species, including the Eastern Curlew and Curlew Sandpiper. The AWSG believe that declines are likely in other shorebird species, but that changes are too hard to record because few sites have been monitored over a long enough period of time.

"It is so sad to know that the habitats these birds use - tidal flats - are being destroyed," says Ken Gosbell, chair of the AWSG. "Time and again I have seen how the amazing story of shorebird migration inspires people."

The AWSG, with Birds Australia, WWF Australia and the Australian Government, recently established the Shorebirds 2020 project. It encourages members of the community to take part in annual counts of shorebird numbers around Australia.

"It is really important to collect data so that we have concrete evidence that this loss is happening," says Gosbell.

In 2004, the AWSG also set up the MYSMA project – Monitoring Yellow Sea Migrants in Australia. Shorebird numbers are counted in northern Australia over summer (when the birds arrive to spend their 'winter' in the Southern Hemisphere). The AWSG have counted fewer shorebirds since data collection began. The numbers of Great Knot have significantly declined and a major drop was witnessed in 2007 and 2008.

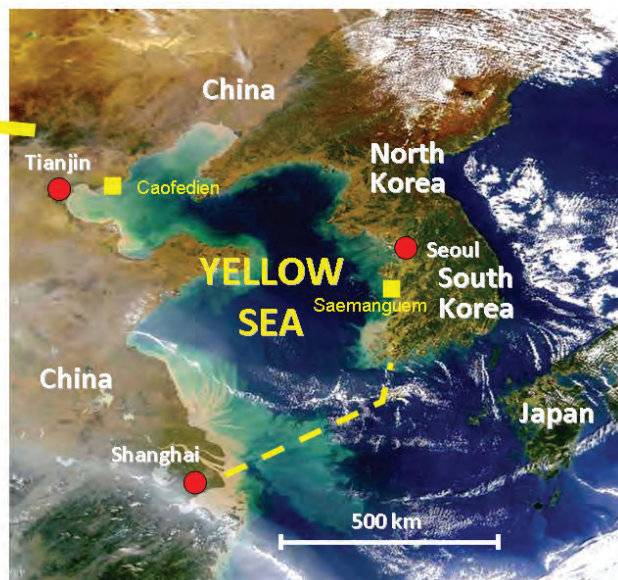
## Saemangeum – a tragedy

From 2006 to 2008 the AWSG teamed up with Birds Korea, a non-government organisation that works to conserve birds and their habitats. With volunteers in other



The East-Asian Australasian Flyway comprises a myriad of migratory pathways from arctic breeding grounds to non-breeding grounds in the southern hemisphere. Most of these pathways converge on the Yellow Sea; its tidal flats are critical fuelling sites for many species of migratory shorebird

Source: AWSG



countries of the Flyway, the organisations ran a special monitoring program.

In 2006, the government of the Republic of Korea finished the construction of a 33-kilometre seawall on the southwest coast. The wall isolated 401 square kilometres of tidal flats (roughly seven times the size of Port Jackson) from the ocean and destroyed the most important shorebird site within the Yellow Sea. 'Saemangeum', once a fertile and vast tidal flat, is now being turned into land for industry and agriculture.

The AWSG and Birds Korea wanted to record the impact of the Saemangeum seawall on shorebird numbers in the Flyway. The results were staggering. The study revealed a decline of 137,000 shorebirds from Saemangeum on their migration north to breed. And between 2006 and 2008, the numbers of nineteen of the most numerous shorebird species dropped. The hardest hit was the Great Knot, an elegant species that breeds in the tundra of Siberia.

***The conversion of tidal flats into land is no less destructive than clearing a rainforest or draining a wetland***

Back in Australia, the MYSMA project also recorded declines in shorebird numbers after 2006. It is estimated that the global population of the Great Knot could have declined by 20 per cent due to one single land reclamation project: Saemangeum.

## Port development in China

A new shorebird threat has recently emerged. This year, the largest Chinese port to

be built to-date, Caofedien, will be completed in Bo Hai Bay in the Yellow Sea. Over 40 square kilometres of tidal flats will be reclaimed.

Dependent on these tidal flats is the Red Knot. Population counts of the shorebird in 2009 recorded roughly 50,000 individual Red Knots in Caofedien. It is thought that up to three-quarters of the Flyway population of Red Knot are dependent on the Caofedien tidal flats during their migration north.

The port of Bo Hai Bay is under development to receive shipments of Australian coal and ore. Australian ships will dock at the core of what was once a Red Knot hotspot.

## Bound by law

Australia has a responsibility to protect migratory shorebirds and the tidal flats they use. At the international level, Australia has signed the Ramsar Convention, or what is officially known as the Convention on Wetlands of International Importance especially as Waterfowl Habitat. As a member, Australia is obliged to protect Australian wetlands that are recognised as internationally important. This involves the development of a detailed management plan to state clearly what needs to be done to maintain a healthy wetland.

Australia has also signed a number of international agreements with other countries (bilateral agreements) that outline how we will work together to protect migratory birds. JAMBA, CAMBA and ROKAMBA are 'Migratory Bird Agreements' we have with Japan, China and the Republic of Korea. The protection of migratory birds and their habitats is pivotal to the agreements, as is the need to share information.

At a national scale, all the birds listed under the Migratory Bird Agreements are also


protected as matters of national significance under the Environment Protection and Biodiversity Conservation Act 1999. Within Australia, this is a powerful law that protects a variety of species and ecosystems from destruction if they are listed as nationally significant. Australian companies or individuals that undertake developments that impact on listed species (including migratory shorebirds) could face serious penalties.

## What can we do?

Tidal flats need urgent protection. Non-government organisations continue to raise awareness about shorebirds and lobby governments to better manage our tidal flats. But the biggest gains will be when tidal flat reclamation in important shorebird habitats is stopped.

It is time to recognise the value of tidal flats – all the values, especially their use by migratory shorebirds. It is imperative the Australian Government works with the governments of China and the Republic of Korea to better manage tidal flat areas in the Yellow Sea; encourage industry to include shorebirds as a priority when assessing development sites; and raise public awareness about the need to protect tidal flats and migratory shorebirds into the future.

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The development of tidal flats and compensation of their loss with other environmental projects is not sustainable. Any investment in development projects within the Yellow Sea region should be carefully considered. You need to ask: What will be lost for an economic gain? Is the loss irreplaceable? 

*Danny Rogers is chairman of the Australian Waders Study Group's (AESG) scientific committee. Ken Gosbell, chair of the AWSG, contributed to this article.*

## Useful websites

- The Australasian Wader Studies Group [www.awsg.org.au](http://www.awsg.org.au)
- Shorebirds 2020 [www.shorebirds.org.au](http://www.shorebirds.org.au)
- Birds Korea [www.birdskorea.org](http://www.birdskorea.org)