

ASPECTS OF SHOREBIRD MIGRATION IN THE KIMBERLEY

On 2 November 2005, Grant Pearson spoke to the Society on the importance of some of the Kimberley wetlands in shorebird migrations. Grant is currently Principal Technical Officer and Centre Manager at the WA Wildlife Research Centre, Department of Conservation and Land Management. He has been involved in the research and management of wetlands and waterbirds since 1973, including shorebird research around Broome and Eighty Mile Beach. Grant has also worked at Camballin, Lake Gregory, sections of King Sound, and ephemeral wetlands east of Broome.

The Kimberley region is included in one of the ten identified global flyways – the East Asian–Australasian flyway. Other flyways are the Indian, Mediterranean, East African, East Atlantic, West Atlantic, Interior American, Patagonian, West Pacific and East Pacific flyways.

Roebuck Bay is a wintering site for birds using the East Asian–Australasian flyway. This flyway includes non-breeding migratory birds that migrate from the Arctic and sub-arctic areas including parts of Alaska, to Asia and Australasia. There are 90 species of shorebirds, 55 of them migrants, with a range of migratory strategies – from multiple short hops, to very long-distance jumps. A race of Bar-tailed Godwits, *Limosa limosa baueri*, is believed to make the 11,000 km southward migration to the southern wintering refuges in Eastern Australia and New Zealand in one flight.

As well as the other sites listed previously, the two main Kimberley Wetlands, Roebuck Bay and Eighty Mile Beach, have a most important role in shorebird migration. There are very significant shorebird numbers in these two areas, including (estimated figures) Great Knots 380,000; Bar-tailed Godwits 325,000; Red necked Stints 315,000; Black winged Stilts 266,000; Red Knots 220,000; and many others in the realm of tens of thousands in number.

Roebuck Bay is possibly the richest tidal mudflat globally, with an intertidal width that can extend for several kilometres. This intertidal zone contains about 200 species of macrofauna, with a very rich bivalve content. This is particularly important for molluscan shorebirds such as Knots and Great Knots. The area is attracting increasing interest from researchers.

Eighty Mile Beach has fewer fauna species than Roebuck Bay – about 112. It has an unusual formation consisting of extensive mudflats up to five km wide along a high impact line of seashore. There is a strong connection between the Mandora Marshes and the freshwater wetlands east of the fore dunes.

Roebuck bay and Eighty-mile Beach are especially important as they contain excellent conditions for migrating birds. Both are remote and relatively undisturbed by humans, with easily accessible food sources that are plentiful, uncontaminated and diverse. They are amongst the most important shorebird sites in the world. Globally, there are about a dozen intertidal mudflats that provide support for significant numbers of shorebirds. Outside Australia, these include the Persian Gulf, the Indian Ganges and Brahmaputra Delta, the northern Yellow Sea mudflats, the Alaskan Copper River delta, James Bay and Bay of Fundy in Canada, the Guyanan soft shores, the bays of Tierra del Fuego, the Archipelago dos Bijagos in Guinea -Bissau, large estuaries in the UK, and the Waddensea area of northern Europe.

Shorebird sites must provide abundant, high-energy food to replenish fat and muscle lost by the birds during long flights. The area must be geographically strategically placed for migration. Breeding success in their northern breeding grounds can depend upon minimal disturbance of wintering roost sites by human inhabitants.

Roebuck Bay and Eighty Mile Beach are comparable with significant northern hemisphere shorebird sites, including the Netherlands Waddensea and the Alaskan Yukon Kuskokwim Delta.

Waddensea has a similar sand flat sediment structure to the Yukon site. There are very low numbers of invertebrate species, but very high densities. There is extensive human impact on the area from commercial shellfisheries, and some species of invertebrates (e.g. the reef forming polychaete Sabellaridae sp.) have been lost. Large budget research is ongoing in this area.

The Yukon Kuskokwim Delta is a significant water bird refuge and contains an enormous density (but low diversity) of bivalves, which provide a rich food source for migrating shorebirds.

Each year, around four million birds migrate through the flyway between the Arctic and Australia. Amongst the long-distance migratory birds, Bar-tailed Godwits are believed to fly from the Yukon area to eastern Australia and New Zealand in one flight of about 11,000 km. Eastern Curlews have been satellite tracked at 5–6000 km on their northward migration from Australia. Currently, studies are underway to determine if Sharp-tailed Sandpipers fly non-stop to Roebuck Bay and Eighty Mile Beach – a distance of about 8000 km.

Some interesting points: shorebirds have the capacity to shrink their internal organs in preparation for migration; they probably fly for 2–3 days without stopping;

the birds 'refuel' at the Yellow Sea or North Korea and finish their flight in Siberia after approximately 10,000 km of flying. The birds then replenish for their eventual return journey, with Red Knots, for example, able to gain 4gms per day, to a total of 105-160 gms. This replenishing is essential as many birds arrive at their destination below fat free weights, having consumed muscle tissue for energy.

Concerns for management include maintenance of conditions of low disturbance to minimise impact on breeding potential. The effects of human impacts, such as disturbance, on our shorebird sites may be realised at great distances away from Australia; there is potential for industrial developments to impact poorly on shorebird areas.

Future plans include: progress towards a marine conservation reserve at Roebuck Bay; development of a Management Plan for the Bay; protection of the conservation values of Eighty Mile Beach; and promoting marine conservation reserve status for Eighty Mile Beach.

With many thanks to Grant Pearson for use of his notes
Chris Brenton

Further reading:

Life along land's edge: Wildlife on the shores of Roebuck Bay, Broome by Danny I Rogers, Theunis Piersma, Marc Lavaleye, Grant B Pearson & Petra de Goeij. Department of Conservation and Land Management, Kensington (WA), 2003. 'Energy sources of the mudflats of Roebuck Bay and the Eighty Mile Beach', a summary of a talk presented by Dr Andrew Storey, *Boab Bulletin*, No 65, December 2004, pp. 5-6.