MIGRATORY SHOREBIRDS IN DARWIN HARBOUR, NORTHERN TERRITORY

INTERIM REPORT 2

REPORT TO THE NORTHERN TERRITORY GOVERNMENT

31 JANUARY 2014

Amanda Lilleyman, Michael J. Lawes and Stephen T. Garnett

Research Institute for the Environment and Livelihoods, Charles Darwin University, Darwin 0909, Northern Territory

Lilleyman, A., Lawes, M.J. and Garnett, S.T. 2014. Migratory shorebirds in Darwin Harbour, Northern Territory. Interim Report 2. Report to the Department of Business, Northern Territory Government

31 January 2014

TABLE OF CONTENTS

BACKGROUND

This project assesses the importance of Darwin Harbour for migratory shorebirds protected under the Environmental Protection and Biodiversity Conservation Act 1999. This final report identifies the work that has been done to date, the future of the project and the expected output from the research that will be done at East Arm Wharf.

This study of migratory shorebird ecology and biology in the Darwin Harbour region will identify important roosting and feeding grounds that require ongoing environmental protection to ensure the migratory shorebirds that visit and inhabit Darwin are protected from the effects of proposed coastal development. The research output from this project will contribute to the overall understanding of the biology and ecology of migratory shorebirds that spend the non-breeding season in Australia and will assist planners and managers in protecting species and habitat.

To date, there is limited information on the abundance, diversity and distribution of migratory shorebirds that use Darwin Harbour in the non-breeding season. Population estimates exist from different sources and are not provided over a temporal scale (Table 1). This project will address this knowledge gap by building a database of shorebird movement and habitat use for the region.

Table 1. Population estimates for shorebirds in the Northern Territory[a] (Chatto 2003), in the East Asian-Australasian Flyway[b] (Department of the Environment Water Heritage and the Arts 2009), the 0.1% national threshold for site significance[c] (Department of the Environment Water Heritage and the Arts 2009), maximum count for species at East Arm Wharf, and the number of counts that exceeded the 0.1% threshold. Taxonomy and species order follows Christidis and Boles (2008).

Shorebird	Scientific name	Estimate of shorebirds in the Northern Territory[a]	EAAF estimate[b]	0.1% threshold[c]	Maximum count at EAW	No. counts at EAW > EPBC threshold
Pacific Golden Plover	*Pluvialis fulva*	200	100000	100	32	0
Grey Plover	*Pluvialis squatarola*	5400	125000	125	8	0
Lesser Sand Plover	*Charadrius mongolus*	39000	140000	40	300	1
Greater Sand Plover	*Charadrius leschenaulltii*	40300	110000	100	210	1
Oriental Plover	*Charadrius verenus*	130	70000	70	25	0
Black-tailed Godwit	*Limosa limosa*	44000	160000	160	7	0
Bar-tailed Godwit	*Limosa lapponica*	53000	325000	325	55	0
Whimbrel	*Numenius phaeopus*	5100	100000	55	69	2
Eastern Curlew	*Numenius madagascariensis*	6800	38000	38	101	5
Terek Sandpiper	*Xenus cinereus*	15000	60000	50	20	0
Common Sandpiper	*Actitus hypoleucos*	180	25000 - 100000	50	3	0
Grey-tailed Tattler	*Tringa brevipes*	16000	50000	40	10	0
Common Greenshank	*Tringa nebularia*	7600	60000	100	112	3
Marsh Sandpiper	*Tringa stagnatilis*	12100	100000 - 1000000	1000	250	0
Wood Sandpiper	*Tringa glareola*	40	100000 - 1000000	100	2	0
Ruddy Turnstone	*Arenaria interpres*	5000	35000	35	1	0
Asian Dowitcher	*Limnodromus semipalmatus*	190	24000	24	3	0
Great Knot	*Calidris tenuirostris*	122000	375000	380	100	0
Red Knot	*Calidris canutus*	24200	220000	220	150	0
Sanderling	*Calirdis alba*	890	22000	320	1	0
Red-necked Stint	*Calidris ruficollis*	44400	325000	160	68	0
Sharp-tailed Sandpiper	*Calidris acuminata*	20100	160000	180	200	1
Curlew Sandpiper	*Calirdris ferruginea*	17800	180000	180	18	0
Broad-billed Sandpiper	*Calidris falcinellus*	2000	25000	25	6	0

PROGRESS SO FAR

2013

September:

- Charles Darwin University Animal Ethics Committee has approved the methods and use of animals for this project (A13014 from August 2013 to August 2017).
- Northern Territory Parks and Wildlife Commission has given approval to take wildlife for commercial purposes, granted under the Territory Parks and Wildlife Conservation Act 2006 (permit number: 48170 from September 2013 to August 2017). Additionally, the Northern Territory Parks and Wildlife Commission has given approval to take wildlife for commercial purposes for macroinvertebrates (permit number: 48045, from July 2013 to June 2014).
- The Australian Bird and Bat Banding Scheme (ABBBS) have given approval to implement a project on protected fauna, including the trapping, banding and tracking of shorebirds.
- The Australasian Wader Studies Group has expressed support for this research.
- Darwin Port Corporation (northern territory government) has approved for research on migratory shorebirds to be conducted at east arm wharf.

October:

- Engagement with Northern Territory Government and Larrakia Nation Aboriginal Corporation under the Darwin Harbour marine rangers program through the biodiversity impact mitigation and offsets strategy (BIMOS).

November:

- Undertook training with the Australasian Wader Studies Group on capture and handling techniques used in migratory shorebird research.

December:

- Co-ordinated and hosted a Shorebirds and I-Tracker workshop with the Northern Australia Indigenous Land and Sea Management Alliance (NAILSMA) as part of training for Larrakia Rangers.

THE FUTURE OF THE PROJECT

In order to meet the aims of this project, I will undertake trapping and tagging of migratory shorebirds to track movements within Darwin Harbour. I will capture shorebirds on the high tide using mist-nets positioned on the incoming tide. Mist-netting of shorebirds will be done at night because shorebirds can easily see and avoid mist-nets during the day. All captured birds will be measured for wing length, bill length, bill to head length, tarsus length, aged from moult and position in moult cycle. Birds will be photographed, ringed with a metal band in accord with the Australian Bird and Bat Banding Scheme (ABBBS), have a plain yellow flag and blue flag applied to the left tibia or have a unique alpha-numeric code-engraved yellow flag and a plain blue flag applied to the tibia. Selected individuals will have tracking devices applied to them. Tracking of shorebirds is widely used in biological and ecological surveys, mostly to understand movement at a local-scale and migration at a global-scale. In the first season (January to April 2014) shorebirds will be captured and leg-flagged; systematic searches for the leg-flagged birds after release will enable me to build a database on shorebird movement between roosting and feeding sites.

I will mount VHF tracking devices on selected individual birds (see Table 2 for leg-flag and device allocation by species). I aim to use radio-telemetry to track between 50 and 100 birds over the two migratory seasons. The devices will be glued on to the skin and trimmed feathers on the rump of the bird. I will use two types of radio-tracking devices, which are small and vary in size (18 x 15 x 8 mm with a 190 mm whip tail, 4.5 g; 30 x 12 x 12 mm with a 230.5 mm whip tail, 8 g) and programmed frequency (150.100 - 150.200 MHz, SirTrack Limited, Havelock North, New Zealand). The local-scale movements of these birds will then be tracked in the Harbour using hand-held radio receivers (Yagi directional three-element antenna, 145 - 155 MHz, SirTrack ultra receiver, 150 – 154 MHz) and an array of automatic receivers set up at strategic high points. This will enable detection of birds at a range of 1 – 3 kilometres. Automatic receivers will scan continuously for tagged birds and log the time and direction of the reading. These data will be downloaded periodically from the field stations onto a computer.

Table 2. Shorebird species leg-flags and tracking device allocation. Numbers of leg-flags and devices used on shorebird species in this study are limited by ethical clearance, commonness and abundance of species in the study area and conservation status.

Species	Plain leg-flags	Engraved leg-flags	VHF transmitters
Pacific Golden Plover	50	-	-
Grey Plover	50	-	-
Terek Sandpiper	50	-	-
Ruddy Turnstone	50	-	-
Sanderling	50	-	-
Red-necked Stint	50	-	-
Lesser Sand Plover	50	-	-
Greater Sand Plover	-	300	20
Black-tailed Godwit	-	50	-
Bar-tailed Godwit	-	100	20
Whimbrel	-	50	10
Eastern Curlew	-	50	20
Grey-tailed Tattler	50	-	-
Common Greenshank	-	50	10
Great Knot	-	300	20
Red Knot	-	100	-
Sharp-tailed Sandpiper	-	50	-

TIMELINE OF RESEARCH ACTIVITIES FOR 2014

February:

- Purchase telemetry equipment: tracking devices, receivers, antennae
- Purchase leg-flags

March:

- Catch shorebirds at East Arm Wharf and apply leg-flags and tracking devices to birds.
- Track shorebirds using handheld receiver.

April-July

- Continue tracking shorebirds using the handheld receiver.
- Determine local-scale movement of shorebirds and perform another catch of shorebirds if necessary.

August-September:

- Catch shorebirds at East Arm Wharf and apply leg-flags and tracking devices to birds.
- Track shorebirds using handheld receiver and set up automatic receivers in the Darwin Harbour region.

October-December:

- Track shorebirds using handheld receiver and set up automatic receivers in the Darwin Harbour region.

February-December:

- Continue to count shorebirds weekly at East Arm Wharf