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## **2009 REPORT NORTH WEST AUSTRALIA**



Image: Ian Southey

Another successful year has finished for the GFN/AWSG collaborative North West Australia colour-banding project. Volunteer participation was high with both experienced local people contributing heavily and novices being introduced to the wonders of shorebird research, mostly via the Broome Bird Observatory's guests.

In addition to the regular colour-banding and scanning activities I led the catching for a team of New Zealand researchers doing 2 projects looking at 'Strategies to overcome feather wear in migratory birds' and 'Capture Myopathy in migratory shorebirds'. During the year 15 cannon net catches were attempted with only one failing to catch any birds. In the 14 other captures 2386 (2026 new and 360 retraps) shorebirds (18 species) and 71 (61 new and 8 retraps) terns (4 species) were caught. Of these 337 (266N 71R) were Bar-tailed Godwit, 723 (583N 140R) Great Knot and 142 (128N 14R) Red Knot. And of these the numbers colour-banded are shown in Table 1. All the sites are on the northern shores of Roebuck Bay 17° 58' 44"S 122° 19' 30"E.

Table 1.

DATE	SITE	BTG	RK	GK	TOTAL
22/02/2009	SBO	20	1	13	<b>34</b>
24/02/2009	ER	16	0	17	<b>33</b>
25/02/2009	NB	0	0	1	<b>1</b>
7/06/2009	RP	0	46	0	<b>46</b>
14/06/2009	CS	0	3	2	<b>5</b>
28/06/2009	2D	47	0	0	<b>47</b>
5/07/2009	WS	16	14	0	<b>30</b>
10/10/2009	2DOG	17	1	5	<b>23</b>
17/10/2009	CS	0	0	45	<b>45</b>
16/11/2009	ER	0	28	0	<b>28</b>
<b>TOTALS</b>		<b>116</b>	<b>93</b>	<b>83</b>	<b>292</b>

This years catching was very successful for shorebirds in general but less so than previous years for the target species. The godwit and knot during the dry season were generally in a single flock and did not frequent the accessible northern beaches as predictably as they have done in most years. It is unknown if this is due to increasing human induced disturbance or to suitable areas of water being available to them in the saltmarsh areas located behind the mangroves that fringe the east of the bay. It is also possible that increasing disturbance during the dry season means birds choose to roost at Bush Point in the south of the bay. We do get resightings of colour banded birds there when we visit. There is also the possibility that a natural redistribution of immature birds to Bush Point occurs during the dry season. Counts show that the difference in total bird numbers between the summer and winter counts at the 3 principal count sites in NWA differs. 80 Mile Beach and the northern shores of Roebuck Bay have approximately 7 times the number of birds during the summer counts but Bush Point only has two to three the number of birds. The 292 colour-banded birds bring the total birds with individual colour-band combinations to 1,576. These marked birds have now yielded a total, over four years, of 9546 re-sightings of individually marked birds locally and internationally.

Table 2 shows the resighting totals for 2009 month by month. Tables 4 to 10 at the end of the document show the species breakdown and re-sighting locations and percentages in more detail.

Table 2.

<b>NUMBER OF MARKED BIRDS RE-SIGHTED BY MONTH</b>		
<b>Year</b>	<b>Month</b>	<b>Number</b>
2009	1	18
2009	2	338
2009	3	183
2009	4	66
2009	5	219
2009	6	87
2009	7	86
2009	8	39
2009	9	243
2009	10	951
2009	11	197
2009	12	634
2009	<b>TOTAL</b>	<b>3061</b>

### **Example Life Histories and sightings from the flyway.**

In addition to the science that will come from this project one of the joys of the work is to see the 'life histories' of the birds building up over the years. It was known from small numbers of band recaptures that birds returned to the same non-breeding areas but it was only assumed that they used the same staging areas each year on migration as little catching is done on most of these sites. With individually marked birds it can be shown that they do indeed use the same areas year after year and therefore while they are adaptable animals they need protection of the mudflat areas in the Yellow Sea as they use them every year. Below is a Bar-tailed Godwit that is regularly seen on the 'western' roosts of Roebuck Bay that uses Yalu Jiang on the China/North Korean border as its favoured staging site on northward migration.

## *Summary of sightings*

### **Bar-tailed Godwit**

#### **Banding/Recapture**

**1BRYR**

27/08/2006 Quarry Beach, Broome (-18.00, 122.37) Australia  
07322064 (1BRYR) Aged 3+

#### **Resighting**

**1BRYR**

12/10/2006 Nicks Beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Sex M Alice Ewing

18/10/2006 Wader Spit, Roebuck Bay, Broome (-17.98, 122.33) Australia  
Sex M Alice Ewing

24/02/2007 Two Dog Hermit beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Sex M Chris Hassell

25/02/2007 Two Dog Hermit beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Sex M Chris Hassell

**06/05/2007 YJNNR SITE 2 (39.83, 124.08) China (mainland)  
Sex M Bai QingQuan**

15/09/2007 Nicks Beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Chris Hassell & Adrian Boyle

15/09/2007 Simpson's Beach, Broome (-17.99, 122.21) Australia  
Clare Morton

01/10/2007 Quarry Beach, Broome (-18.00, 122.37) Australia  
Alice Ewing

03/10/2007 Quarry Beach, Broome (-18.00, 122.37) Australia  
Sex M Alice Ewing

14/12/2007 Simpson's Beach, Broome (-17.99, 122.21) Australia  
Clare Morton

16/02/2008 Stilt Viewing, Roebuck Bay, Broome (-17.98, 122.33) Australia  
Sex M Chris Hassell & Adrian Boyle

29/02/2008 Two Dog Hermit beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Sex M Chris Hassell

29/02/2008 Two Dog Hermit beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Chris Hassell

27/03/2008 Two Dog Hermit beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Chris Hassell & Rob Berry

**26/04/2008 Yalu Jiang National Nature Reserve (39.80, 124.00) China (mainland)  
Bai Qing Quan**

05/09/2008 Quarry Beach, West Australia  
Chris Hassell

18/10/2008 Two Dog Hermit beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Alice Ewing

**11/04/2009 Yalu Jiang Ashponds (39.86, 124.19) China (mainland)  
Bai Qing Quan & Shao Feng**

**10/05/2009 Yalu Jiang Ashponds (39.86, 124.19) China (mainland)  
Bai Qing Quan**

09/09/2009 Nicks Beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Sex M Chris Hassell

15/10/2009 Wader Spit, Roebuck Bay, Broome (-17.98, 122.33) Australia  
Sex M Chris Hassell

02/12/2009 Simpson's Beach, Broome (-17.99, 122.21) Australia  
Adrian Boyle & Maurice O'Connor

31/12/2009 Wader Beach, Roebuck Bay, Broome (-17.98, 122.33) Australia  
Matt Slaymaker

09/01/2010 Boiler, Roebuck Bay Australia  
Matt Slaymaker

01/02/2010 Simpson's Beach, Broome (-17.99, 122.21) Australia  
Grant Morton & Clare Morton

03/02/2010	Simpson's Beach, Broome (-17.99, 122.21) Australia Grant Morton & Clare Morton
04/02/2010	Simpson's Beach, Broome (-17.99, 122.21) Australia Grant Morton & Clare Morton
17/02/2010	Simpson's Beach, Broome (-17.99, 122.21) Australia Grant Morton & Clare Morton
19/02/2010	Simpson's Beach, Broome (-17.99, 122.21) Australia Sex M Grant Morton & Clare Morton
20/02/2010	Simpson's Beach, Broome (-17.99, 122.21) Australia Sex M Grant Morton & Clare Morton
21/02/2010	Simpson's Beach, Broome (-17.99, 122.21) Australia Sex M Grant Morton & Clare Morton
22/02/2010	Two Dog Hermit beach, Roebuck Bay, Broome (-18.00, 122.37) Australia Sex M Theunis Piersma & Petra de Goeij
18/03/2010	Simpson's Beach, Broome (-17.99, 122.21) Australia Grant Morton & Clare Morton
<b>18/04/2010</b>	<b>Yalu Jiang Site 2 (39.83, 124.08) China (mainland)</b> <b>Jimmy Choi</b>

It is known from satellite tracking work that birds travel at considerable speeds for days at a time when on their migratory flights. But it is not always necessary to spend the enormous sums of money that brilliant technology requires. Below is a fantastic example of an individually marked Great Knot seen at a roost in Roebuck Bay and then seen at Yalu Jiang 6400km away 137 hours later. It is not too far-fetched to say that the bird migrated within a few hours of its Roebuck Bay sighting flew at approximately 55km/hr for 116 of those hours and fell asleep when it arrived and was seen by Jimmy Choi soon after that. It took Jimmy ages to see the combination as the bird was sound asleep on one leg which seems reasonable after an undertaking like that!

## *Summary of sightings*

### **Great Knot**

#### **Banding/Recapture**

**1LYRL**

12/08/2007 Richards Point, Roebuck Bay, Broome (-18.00, 122.37) Australia  
06289994 (1LYRL) Aged 3+

#### **Resighting**

**1LYRL**

18/08/2007 Campsite Beach, Roebuck Bay, Broome (-17.98, 122.31) Australia  
Chris Hassell & Adrian Boyle

27/08/2007 Campsite Beach, Roebuck Bay, Broome (-17.98, 122.31) Australia  
Chris Hassell

28/11/2007 Beaches, Crab Ck Rd, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Sue Rice

18/12/2007 Boiler, Roebuck Bay Australia  
Chris Hassell & Adrian Boyle

- 15/02/2008 Eagles Roost, Roebuck Bay, Broome (-17.92, 122.58) Australia  
Theunis Piersma & Chris Hassell
- 6/02/2008 Stilt Viewing, Roebuck Bay, Broome (-17.98, 122.33) Australia  
Chris Hassell & Adrian Boyle
- 03/03/2009 Two Dog Hermit beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Chris Hassell
- 25/10/2009 Stilt Viewing, Roebuck Bay, Broome (-17.98, 122.33) Australia  
Chris Hassell & Matt Slaymaker
- 09/12/2009 Boiler, Roebuck Bay Australia  
Chris Hassell
- 20/02/2010 Two Dog Hermit beach, Roebuck Bay, Broome (-18.00, 122.37) Australia  
Chris Hassell & Birgetta Hansen
- 23/03/2010 **Stilt Viewing, Roebuck Bay, Broome (-17.98, 122.33) Australia**  
**Chris Hassell**  
**SEEN AT YJ 904AM ON 29TH**
- 29/03/2010 **Dandong, Liaoning, Yalu Jiang National Nature Reserve (39.85, 124.18) China (mainland)**  
**Jimmy Choi**  
**SEEN AT ROEBUCK BAY 4PM ON 23RD**

As with last year I was pleased with the number of Red Knot colour-banded, only 10 fewer than 2008, this species is relatively difficult to catch at Roebuck Bay. An excellent catch of 46 birds was made in the mid-dry season and some of these birds moved to NZ. Many sites in New Zealand are 'well-watched', unlike Victoria where little resighting work is done, and so the results may be biased towards these well-watched sites in New Zealand. The connection between Roebuck Bay and New Zealand in relation to the two Red knot populations occurring in the East Asian-Australasian Flyway (*rogersi* and *piersmai*) is still not well understood despite the amount of research done at both locations and in Victoria, south east Australia. But gradually it is piecing it together; see the paper by Rogers *et al* elsewhere in this report.

## **Bohai Sea**



Image: A. Boyle

During May 9 to May 29 GFN, represented by Adrian Boyle and I, were at the 3 study sites of PhD student Miss Yang Hong-Yan near Nan Pu Development City, situated on the edge of Bohai Bay, 190 km south east of Beijing China 39° 03' 48"S 118° 13' 03"E. The main aim of our field work was to find colour banded and flagged birds with attention particularly focused on Red Knots.

The area we were working in was, like much of the Yellow Sea coast, under a lot of pressure from development with large areas of mudflats destroyed and covered in industry and much more planned. Enormous mud flat areas have been changed to industrial sites very close-by and 2 ports and a new highway are being developed.

This is of concern as from our work there we have found it to be of great importance to many species. However the tidal flats that do remain in the area support huge numbers of birds with our colleagues Miss Yang Hong-Yan and Mr. Chen Bing counting up to 50,000 Red Knot at the three study sites during the peak time. Other outstanding records were tens of thousands of Curlew Sandpipers a feeding flock of 450 Asian Dowitchers and a roost of 5000 Broad-billed Sandpipers. The reason for the huge numbers of birds here may be due to the destruction of nearby mudflats. The importance of this site in the East Asian-Australasian Flyway is not in doubt. It meets Ramsar status on many levels. Its central role in the flyway is also highlighted by the number of countries birds represented here. We have seen flags from 12 banding locations in the EAAF, New Zealand, Tasmania, Victoria, South Australia, North West Australia, Northern Territory, Sumatra Thailand, Chongming Dongtan, Kamchatka, Chukotka and the Relict Gulls from Western China.

We saw 74 individually colour-banded Red Knot, from a marked population of 312. That is 23.72% and is quite remarkable; remember we didn't mark them here! We marked them in Roebuck Bay 6500km to the south.

Interestingly the birds seemed to be doing well with the abdominal profiles (fat deposits) of birds being at 4 and 5 (on a scale of 1-5) but we are sure they are down to the minimum area such large numbers of birds would need for successful fuelling. After speaking with our hosts Yang Hong-Yan and Chen Bing it seems that almost zero Red Knots use this area on southward migration so it is still a mystery on where they stop on their journey south.

Our total of plain flag, engraved flag and colour-band sightings are shown in the table below. These are not necessarily 865 individuals of course, as with the plain flags we can't say for sure if we see the same ones day in-day out although due to the number of new colour band birds we were seeing up to our last field visit we are almost certainly seeing new plain flags each day. See Table below.

FLAGGED AT AND TYPE OF MARK	NUMBER OF SIGHTINGS	KNOWN INDIVIDUAL BIRDS
CHONGMING DONTANG, CHINA ELF	12	1
CHONGMING DONTANG, CHINA PLAIN	49	
CHUKOTKA, EASTERN SIBERIA	1	
KAMCHATKA, EASTERN RUSSIA	2	
KING ISLAND, TASMANIA ELF	1	1
NEW ZEALAND COLOUR BAND	36	26
NEW ZEALAND ELF	55	22
NEW ZEALAND PLAIN	45	
NORTHERN TERRITORY	2	
NORTH WEST AUSTRALIA COLOUR BAND	139	76
NORTH WEST AUSTRALIA ELF	51	14
NORTH WEST AUSTRALIA PLAIN	216	
NORTH WEST AUSTRALIA TRACKING 2000	22	3
QUEENSLAND PLAIN	1	
SOUTH AUSTRALIA	13	
SUMARTRA	4	
THAILAND	23	
UNKNOWN	1	
VICTORIA	186	
<b>TOTAL</b>	<b>859</b>	<b>143</b>

The romance of bird research in China



Image: C. Hassell

## Introducing the local workers to their birds



Image: C. Hassell

### **Local movements**

A surprising aspect of the project so far has been the movement of birds between Roebuck Bay and 80 Mile Beach and the use of 80 Mile Beach itself. 80 Mile Beach starts 133km south west of the northern shores of Roebuck Bay and stretches for 220km. We originally thought there was little mixing between the two sites but colour-band resightings show that not to be the case, particularly for Red and Great Knot with 13% of our marked population of these species having been seen at 80 Mile Beach. Most, but not all of these, have been marked as first year birds and move in their second year of life (particularly Red Knot) during the months of September and October. Most seem to stay at 80 Mile Beach once they 'adopt' it as 'home' but some return to Roebuck Bay and some move on to New Zealand. Once they are at 80 Mile Beach it is difficult to interpret how they use the beach. Due to logistics and expense we only visit about 3 times a year for dedicated re-sightings work and 3 times a year for population monitoring when we get incidental resightings. The data we do collect shows very little consistency in bird's habits, they don't appear to roost opposite where they forage as would be expected. In Roebuck Bay the majority of resightings are undertaken at high tide roosts with little done while the birds forage on the mudflats. At 80 Mile Beach we are able to do a reasonable amount of scanning of birds as they feed during the last part of an incoming tide and as they pre-roost on the mud. The birds sometimes then take long southward movements to their final roosting site but this is not consistent day to day month to month or year to year. In Roebuck Bay birds are generally faithful to the beaches they roost on and they are usually either 'eastern birds' or 'western birds' and this is shown in

their resighting history day to day, month to month and year to year. There is more mixing on the lower tides and nearly all birds move to Crab Creek in the far north east of the bay before moving back to their favoured roosts. This is a maximum movement one-way of 9km. Birds at 80MB move 40 to 50km between foraging and roosting sites despite the apparent suitability of the beach adjacent to their foraging areas for roosting. Yet another example of how gathering good data raises as many questions as it answers!

Why did the birds below stay at 10-15km, on a higher tide than the previous day, when the beach at that point is far narrower than the beach they chose just the day before? Note the sightings from previous visits as well. All scans are conducted on very similar tide heights.

## *Summary of sightings*

### **Red Knot**

#### **Banding/Recapture**

**1BLBR**

26/07/2008 Wader Spit, Roebuck Bay, Broome (-18.00, 122.37) Australia  
05251435 (1BLBR) Aged 1  
NO BLOOD

#### **Resighting**

**1BLBR**

01/08/2008 Quarry Beach, Broome (-18.00, 122.37) Australia  
Chris Hassell

09/08/2008 Wader Beach, Roebuck Bay, Broome (-17.98, 122.33) Australia  
Chris Hassell

13/02/2010 80 Mile Beach 30-35KM (19.44, 121.24) Australia  
Grant Morton ... & Petra de Goeij

**11/04/2010 80 MILE BEACH 5-10KM SOUTH Australia**  
**Chris Hassell & Maurice O'Connor**  
**PMAI**

**12/04/2010 80 Mile Beach 45-50KM (19.52, 121.14) Australia**  
**Chris Hassell & Maurice O'Connor**  
**PMAI**

**12/04/2010 80 Mile Beach 50-55KM South (-19.54, 121.10) Australia**  
**Chris Hassell & Maurice O'Connor**  
**PMAI**

**13/04/2010 80 Mile Beach 10-15KM South (-19.26, 121.37) Australia**  
**Chris Hassell & Maurice O'Connor**

## *Summary of sightings*

### **Red Knot**

#### **Banding/Recapture**

**2LLBY**

05/07/2009 Wader Spit, Roebuck Bay, Broome (-18.00, 122.37) Australia  
05254365 (2LLBY) Aged 1  
NO BLOOD

#### **Resighting**

**2LLBY**

09/11/2009 80 Mile Beach 55-60KM South (-19.57, 121.07) Australia  
Nik Ward & Roz Jessop

**12/04/2010 80 Mile Beach 50-55KM South (-19.54, 121.10) Australia**  
**Chris Hassell & Maurice O'Connor**  
**SUBSP?**

**13/04/2010 80 Mile Beach 10-15KM South (-19.26, 121.37) Australia**  
**Chris Hassell & Maurice O'Connor**  
**ROG?**

# Summary of sightings

## Red Knot

### Banding/Recapture

2LRLR

05/07/2009 Wader Spit, Roebuck Bay, Broome (-18.00, 122.37) Australia  
05254372 (2LRLR) Aged 1

### Resighting

2LRLR

29/11/2009 80 Mile Beach 20-25KM (19.37, 121.31) Australia  
Chris Hassell

30/11/2009 80 Mile Beach 55-60KM South (-19.57, 121.07) Australia  
Chris Hassell

01/12/2009 80 Mile Beach 55-60KM South (-19.57, 121.07) Australia  
Adrian Boyle ... & Kim Onton

12/04/2010 80 Mile Beach 50-55KM South (-19.54, 121.10) Australia  
Chris Hassell & Maurice O'Connor  
SUBSP?

13/04/2010 80 Mile Beach 10-15KM South (-19.26, 121.37) Australia  
Chris Hassell & Maurice O'Connor  
SUBSP?

## Tables

Table 4.

SEEN OR UNSEEN?			
SPECIES	N	SEEN?	%
Bar-tailed Godwit	81	no	13%
Bar-tailed Godwit	550	yes	87%
<b>TOTAL</b>	<b>631</b>		<b>100%</b>

Table 5.

STATUS OF MARKED BIRDS			
SPECIES	N	STATUS	%
Bar-tailed Godwit	81	NOT SEEN	13%
Bar-tailed Godwit	23	SEEN AT 80MB	4%
Bar-tailed Godwit	503	SEEN AT RB	80%
Bar-tailed Godwit	24	SEEN OS	4%
<b>TOTAL</b>	<b>631</b>		<b>100%</b>

Table 6.

SEEN OR UNSEEN?			
SPECIES	N	SEEN?	%
Red Knot	105	no	24%
Red Knot	324	yes	76%
<b>TOTAL</b>	<b>429</b>		<b>100%</b>

Table 7.

SPECIES	N	STATUS	%
Red Knot	105	NOT SEEN	24%
Red Knot	57	SEEN AT 80MB	13%
Red Knot	160	SEEN AT RB	37%
Red Knot	107	SEEN OS	25%
<b>TOTAL</b>	<b>429</b>		<b>100%</b>

Table 8.

<b>SEEN OR UNSEEN?</b>			
<b>SPECIES</b>	<b>N</b>	<b>SEEN?</b>	<b>%</b>
Great Knot	79	no	12%
Great Knot	581	yes	88%
<b>TOTAL</b>	<b>660</b>		<b>100%</b>

Table 9.

<b>STATUS OF MARKED BIRDS</b>			
<b>SPECIES</b>	<b>N</b>	<b>STATUS</b>	<b>%</b>
Great Knot	79	NOT SEEN	12%
Great Knot	85	SEEN AT 80MB	13%
Great Knot	457	SEEN AT RB or CW	69%
Great Knot	39	SEEN OS	6%
<b>TOTAL</b>	<b>660</b>		<b>100%</b>

NOT SEEN = marked bird not seen since banding.

SEEN AT 80MB = seen at 80 Mile Beach 165 to 220KM south west of Roebuck Bay.

SEEN AT RB = seen in Roebuck Bay including Bush Point.

SEEN OS = seen overseas in either New Zealand, China, Korea or Taiwan.

SEEN CW = seen at Coconut Well Beach 25KM north west of Roebuck Bay.

With long term research projects such as individual colour-marking of individual birds the results improve with each year of the project. This shows in Table 10 below, the comparison of the individual birds seen or unseen during 2007, 2008 and 2009.

Table 10

**Results at end 2007**

<b>SEEN OR UNSEEN?</b>			
<b>SPECIES</b>	<b>N</b>	<b>SEEN?</b>	<b>%</b>
Bar-tailed Godwit	98	no	29.34
Bar-tailed Godwit	236	yes	70.66
<b>TOTAL</b>	<b>334</b>		<b>100</b>

**Results at end 2008**

<b>SEEN OR UNSEEN?</b>			
<b>SPECIES</b>	<b>N</b>	<b>SEEN?</b>	<b>%</b>
Bar-tailed Godwit	85	no	18%
Bar-tailed Godwit	395	yes	82%
<b>TOTAL</b>	<b>480</b>		<b>100%</b>

**Results at end 2009**

<b>SEEN OR UNSEEN?</b>			
<b>SPECIES</b>	<b>N</b>	<b>SEEN?</b>	<b>%</b>
Bar-tailed Godwit	81	no	13%
Bar-tailed Godwit	550	yes	87%
<b>TOTAL</b>	<b>631</b>		<b>100%</b>

<b>SEEN OR UNSEEN?</b>			
<b>SPECIES</b>	<b>N</b>	<b>SEEN?</b>	<b>%</b>
Great Knot	93	no	28.01
Great Knot	239	yes	71.99
<b>TOTAL</b>	<b>332</b>		<b>100</b>

<b>SEEN OR UNSEEN?</b>			
<b>SPECIES</b>	<b>N</b>	<b>SEEN?</b>	<b>%</b>
Great Knot	102	no	18%
Great Knot	452	yes	82%
<b>TOTAL</b>	<b>554</b>		<b>100%</b>

<b>SEEN OR UNSEEN?</b>			
<b>SPECIES</b>	<b>N</b>	<b>SEEN?</b>	<b>%</b>
Great Knot	79	no	13%
Great Knot	581	yes	87%
<b>TOTAL</b>	<b>660</b>		<b>100%</b>

<b>SEEN OR UNSEEN?</b>			
<b>SPECIES</b>	<b>N</b>	<b>SEEN?</b>	<b>%</b>
Red Knot	77	no	36.84
Red Knot	132	yes	63.16
<b>TOTAL</b>	<b>209</b>		<b>100</b>

<b>SEEN OR UNSEEN?</b>			
<b>SPECIES</b>	<b>N</b>	<b>SEEN?</b>	<b>%</b>
Red Knot	90	no	28%
Red Knot	236	yes	72%
<b>TOTAL</b>	<b>326</b>		<b>100%</b>

<b>SEEN OR UNSEEN?</b>			
<b>SPECIES</b>	<b>N</b>	<b>SEEN?</b>	<b>%</b>
Red Knot	105	no	25%
Red Knot	324	yes	75%
<b>TOTAL</b>	<b>429</b>		<b>100%</b>

## **Acknowledgments.**

I would like to thank my local Broome volunteer team for all their skill and hard work during cannon net catches and the numerous people throughout the EAAF for sightings of my birds. In particular I would like to thank Adrian Boyle for constant help and ideas in all aspects of field work, Alice Ewing for a huge set of sightings during October and Clare and Grant Morton for resightings throughout the year. I also thank Liz Rosenberg for editing and Danny Rogers and Liz Rosenberg for comments on this report.

And especially to Heather Gibbs for design and constant updating of the database to meet my every whim.



Image: Don Hadden