Wader Breeding Success in the 2010 Arctic Summer, based on Juvenile Ratios of Birds which Spend the Non-breeding Season in Australia

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Introduction

This paper gives the results for 2010/2011 of the "percentage juvenile sampling" based on catches carried out in south-east Australia (SEA) and in north-west Australia (NWA) during the November 2010 to March 2011 wader non-breeding season. This is the time when wader populations in Australia are relatively stable with all juvenile birds having arrived and before northward migration of adults has commenced.

This type of data has now been systematically collected over 33 seasons for some species in SEA and for 13 years in NWA. Since 2000 the results have been published annually in Arctic Birds and in Stilt (Minton *et al*. 2000, 2009). The long series of data now enables each year's activity to be seen in context and periods of above or below average breeding success to be identified. Productivity is a key parameter to monitor, especially at a time when many wader populations in the East Asian–Australasian Flyway are declining rapidly (Stroud et al. 2006).

Methods

Data was collected in 2010/2011 in the usual way (Minton *et al.* 2005). All birds included in the analysis were caught by cannon-netting, generally at the same range of sites each year. The timing of catches is also similar in most years, although in this last season the main catching in NWA was carried out in the second half of February/early March rather than the usual November/early December period. Also the results of Ruddy Turnstone* catching in King Island in the period 5–12 April are included in the SEA analysis because no adult birds had yet departed and because King Island birds were a significant part of the sample in other recent years. The percentage of juveniles in these catches is an indication (an index, not necessarily an absolute measurement for the whole population) of breeding success in the previous Arctic summer (in this case 2010).

Based on percentages of juveniles and deviation of this parameter from the species-specific long-term average we use a 6-grade scale (excellent, very good, good, average, poor, very poor) to evaluate breeding success in 2010. When the figure is close to average but not on it and not different enough to be called good or poor then we suggest to indicate which side of average it was (e.g., below average). Obviously where we put the assessments in brackets this is because either this year's sample is too small to be confident or because there isn't a previous history of data to compare with.

* – scientific names are given in tables

Results and Discussion

The data is presented in the usual format in a range of tables (Tables 1 to 4).

South-east Australia (SEA)

In SEA it was not possible, for the first time ever, to obtain samples of Curlew Sandpiper and Sharp-tailed Sandpiper. Sampling of Red-necked Stints was also reduced from most recent years. This is attributed to exceptional circumstances whereby regular heavy rainfall across the whole of inland Australia occurred in almost every month from April 2010 up to the present time (May 2011). The result of this was that there were large numbers of ephemeral wetlands across inland Australia providing extremely suitable wader habitat. It appears that Sharp-tailed Sandpipers, which prefer inland freshwater habitats if available, and many Curlew Sandpipers and Red-necked Stints stopped off at these locations during southward migration across the continent in August/October 2010. They therefore never reached the main catch sampling sites along the Victorian coast. Small waders have often been reported using temporary inland wetlands but most of these normally dry up during the hot December to February period each year and such waders then continue their journey on to the coastal non-breeding areas. Because of the continuing inland rains this did not happen in the 2010/2011 period.

Good catching success was however achieved on those species which are strongly coastal in their habitat preference. It is particularly pleasing that some small catches of Red Knot were obtained in the sampling season for the first time since 2006/07. This was mainly because numbers increased as a result of a very good breeding season (*rogersi* subspecies from Chukotka in north-east Siberia).

The results in Table 1 show that most of the wader populations in SEA had a second successive good/very good breeding season during the Arctic summer of 2010. It was pleasing that Red-necked Stints had an improved breeding season. Although the percentage juvenile figure was only marginally above the average for the last 12 years this was the first time since the 2003 breeding season that this has occurred. Only Bar-tailed Godwit had a poor breeding year. The population in SEA is mainly the *baueri* subspecies, which breeds in Alaska where conditions may well have been markedly different from those of northern Siberia during the 2010 Arctic summer.

North-west Australia (NWA)

The results for NWA wader populations are given in Table 2. There is nothing in the data to suggest that this year's sampling being rather later in the non-breeding season has had any significant effect on the juvenile percentage figures.

As in SEA Red-necked Stint and Curlew Sandpipers were rather harder to come by as numbers were reduced, probably again caused by some birds moving inland to feed in the extensive freshwater habitats present this year. A similar reason probably accounts for a complete lack of Sharp-tailed Sandpipers on the shore and, for the first time ever, no Sharp-tailed Sandpipers being cannon-netted either at Roebuck Bay, Broome, or at 80 Mile Beach.

All the Arctic-breeding waders for which adequate samples were obtained in NWA had average or above average breeding success in 2010. Great Knot and Bar-tailed Godwit (*menzbieri* subspecies) had excellent breeding outcomes. Unfortunately insufficient Sanderling and Ruddy Turnstone were caught for any measure of their breeding success this year.

Waders breeding at slightly lower latitudes in Siberia also had very good breeding success. Only the most southerly breeders of those regularly monitored – Greater Sand Plover – had a poor breeding outcome. This suggests that weather conditions (early snowmelt, above average temperatures, no late snowfall at the time of chick hatching etc.) and predation pressures (high lemming numbers, low numbers of adult predators) may have been favourable for wader breeding success over wide areas of northern and central Siberia during the 2010 June/July breeding season.

Conclusion

It is particularly pleasing to have now had two successive good breeding seasons in the Arctic, in 2009 and 2010. With so many wader populations in marked decline in the East Asian–Australasian Flyway this will be of particular benefit in trying to make good some of the losses. Hopefully wader migration patterns within Australia will return to normal in the 2011/2012 season thereby enabling population counts to be more realistic indicators of population trends.

Monitoring of the juvenile content of wader populations in SEA and NWA will be continued in the 2011/2012 season.

Acknowledgements

All members of the Victorian Wader Study Group and participants in the NWA Australasian Wader Study Group Wader Expeditions are thanked for their enormous efforts in the field in collecting this data during the 2010/2011 non-breeding season in Australia. The physical effort of making catches and the need to band and process birds within a reasonable time scale after capture mean that large teams are necessary for cannon-netting operations. This is especially so in NWA where protective shade has to be erected to keep birds cool in the generally hot and sunny conditions.

Heather Gibbs is thanked for typing this year's update of Tables 1 to 4.

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Table 1. Percentage of juvenile/first year waders in cannon-net catches in south-east Australia in 2010/2011

Species	No. of catches		Total caught	Juv./1st year		Long term median* % juvenile (years)	Assessment of 2010 breeding success
	Large (>50)	Small (<50)		No.	%		
Red-necked Stint *Calidris ruficollis*	6	5	1219	249	**20.4**	14.1 (32)	Good
Curlew Sandpiper *C. ferruginea*	0	0	0	0	**(-)**	10.6 (31)	-
Bar-tailed Godwit *Limosa lapponica*	3	0	284	29	**10.2**	19.4 (21)	Poor
Red Knot *C. canutus*	0	4	63	49	**77.8**	52.1 (17)	Very good
Ruddy Turnstone *Arenaria interpres*	1	17	446	114	**25.6**	9.8 (20)	Very good
Sanderling *C. alba*	1	0	70	15	**21.4**	12.6 (19)	Good
Sharp-tailed Sandpiper *C. acuminata*	0	0	0	0	**(-)**	11.6 (29)	-
All birds cannon-netted in period 15 November to 28 February except for Red-necked Stint, Ruddy Turnstone, and Sanderling, for which catches up to 25 March are included. * Does **not** include the 2010/2011 figures							

Table 2. Percentage of juvenile/first year waders in cannon-net catches in north-west Australia in 2010/2011

Species	No. of catches		Total caught	Juv/1st year		Assessment of 2010 breeding success
	Large (>50)	Small (<50)		No.	%	
Great Knot *Calidris tenuirostris*	8	4	1166	279	**23.9**	Excellent
Bar-tailed Godwit *Limosa lapponica*	3	5	365	78	**21.3**	Excellent
Red-necked Stint *C. ruficollis*	2	4	432	80	**18.5**	Average
Red Knot *C. canutus*	2	7	210	34	**16.2**	Average
Curlew Sandpiper *C. ferruginea*	0	6	82	20	**24.4**	Good
Ruddy Turnstone *Arenaria interpres*	0	4	4	1	**(-)**	-
Sanderling C. *alba*	0	3	3	1	**(-)**	-
Sharp-tailed Sandpiper *C. acuminata*	0	0	0	0	**(-)**	-
Non-arctic northern migrants						
Greater Sand Plover *Charadrius leschenaultii*	4	6	586	100	**17.1**	Poor
Terek Sandpiper *Xenus cinereus*	1	6	151	38	**25.2**	Very good
Grey-tailed Tattler *Heteroscelus brevipes*	1	10	130	41	**31.5**	Very good
Broadbilled Sandpiper *limicola falcinellus*	0	2	29	17	**58.6**	Very good
All birds cannon-netted in period 1 November to mid-March						

Table 3. Percentage of first year birds in wader catches in south-east Australia 1998/1999 to 2010/2011

Species	**98/99**	**99/00**	**00/01**	**01/02**	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	***Average (12 yrs)***
Ruddy Turnstone *Arenaria interpres*	6.2	29	10	9.3	17	6.7	12	28	1.3	19	0.7	19	26	*13.2*
Red-necked Stint *Calidris ruficollis*	32	23	13	35	13	23	10	7.4	14	10	15	12	20	*17.0*
Curlew Sandpiper *C. ferruginea*	4.1	20	6.8	27	15	15	22	27	4.9	33	10	27	(-)	*17.6*
Sharp-tailed Sandpiper *C. acuminata*	11	10	16	7.9	20	39	42	27	12	20	3.6	32	(-)	*20.0*
Sanderling *C. alba*	10	13	2.9	10	43	2.7	16	62	0.5	14	2.9	19	21	*16.3*
Red Knot *C. canutus*	(2.8)	38	52	69	(92)	(86)	29	73	58	(75)	(-)	(-)	78	*53.1*
Bar-tailed Godwit *Limosa lapponica*	41	19	3.6	1.4	16	2.3	38	40	26	56	29	31	10	*25.1*
All birds cannon-netted between mid November and 25 March (except Sharp-tailed Sandpiper and Curlew Sandpiper to end February only). Averages (for previous 12 years) exclude figures in brackets (small samples) and **exclude** 2010/2011 figures														

Table 4. Percentage of first year birds in wader catches in north-west Australia 1998/1999 to 2010/2011

Species	**98/99**	**99/00**	**00/01**	**01/02**	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**	***Average (12 yrs)***
Red-necked Stint *Calidris ruficollis*	26	46	15	17	41	10	13	20	21	20	10	17	18	*21.3*
Curlew Sandpiper *C. ferruginea*	9.3	22	11	19	15	7.4	21	37	11	29	10	35	24	*19.0*
Great Knot *C. tenuirostris*	2.4	4.8	18	5.2	17	16	3.2	12	9.2	12	6	41	24	*12.2*
Red Knot *C. canutus*	3.3	14	9.6	5.4	32	3.2	(12)	57	11	23	12	52	16	*20.2*
Bar-tailed Godwit *Limosa lapponica*	2.0	10	4.8	15	13	9.0	6.7	11	8.5	8	4	28	21	*10.0*
Non-arctic northern migrants														
Greater Sand Plover *Charadrius leschenaultii*	25	33	22	13	32	24	21	9.5	21	27	27	35	17	*24.2*
Terek Sandpiper *Xenus cinereus*	12	(0)	8.5	12	11	19	14	13	11	13	15	19	25	*13.4*
Grey-tailed Tattler *Heteroscelus brevipes*	26	(44)	17	17	9.0	14	11	15	28	25	38	24	31	*20.4*
All birds cannon-netted in the period 1 November to mid-March. Averages (for previous 12 years) exclude figures in brackets (small samples) and **exclude** 2010/2011 figures														