

WADER BREEDING SUCCESS IN THE 2016 ARCTIC SUMMER, BASED ON JUVENILE RATIOS OF BIRDS WHICH SPEND THE NON-BREEDING SEASON IN AUSTRALIA

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INTRODUCTION

One thing which banders in Australia look forward to greatly each year is the return of the northern hemisphere migrants – adults first followed a few weeks afterwards by the juvenile birds. There is eager anticipation to know what sort of breeding season each species has had during the arctic summer. Sometimes there is a fair correlation between each species e.g. the majority having had a ‘good’ year or a ‘bad’ year. But nearly always there are some marked differences of a few species from the norm. These variations will be the result of differences in weather conditions and/or predation levels in the respective breeding areas of each population.

The percentage of juveniles in the populations of waders which we cannon net in the November to March period is the best measure we can make of their relative breeding success. It needs to be recognised, however, that this data is collected, on average, some six months after the end of the arctic breeding season (June/July). Since this time birds will have made their southward migration during which juvenile birds would be expected to suffer higher mortality. The percentage juvenile figures measured will not be the same therefore as they would have been if measured immediately after the birds had fledged in late-July. However, by collecting such data in a standard manner each year (cannon netting samples of each species at a variety of locations) comparisons between years and between species can be made. But because of potential non-homogeneity in the distribution of adult and juvenile/first year birds in their non-breeding areas, the figures should more correctly be considered an index of breeding success rather than an absolute measure.

‘Percentage juvenile’ data has been collected by the VWSG since the 1978/79 breeding season in south-east Australia (SEA) and since the 1998/99 non-breeding season in north-west Australia (NWA). So there is a long history of ‘breeding success’ data against which to compare each new year’s results.

This paper presents the data collected during the 2016/17 non-breeding season in Australia. A range of species is covered, with birds being caught in two widely separated regions of Australia, some 3000km apart. Data is thus available on some species from two widely separated non-breeding areas. In many cases the breeding location of the population of each species in each of these non-breeding areas is now known from banding, flagging, geolocator and satellite transmitter studies. This will permit, in due course, further analyses of possible reasons for the recorded variations in annual breeding success.

METHODS

Samples were caught at the usual range of locations in both NWA and SEA. Only birds caught by cannon netting are included in the figures.

RESULTS & DISCUSSION

The 2016/17 data is presented in the usual format in Tables 1-4.

In south-east Australia, good samples of Red-necked Stint, Curlew Sandpiper, Ruddy Turnstone and Sanderling were obtained but only modest numbers of Red Knot and Bar-tailed Godwit and only a handful of Sharp-tailed Sandpiper. The scarcity of Sharp-tailed Sandpiper in the sampling coastal areas was caused by much suitable inland habitat being available, created by favourable rains over the winter months.

Bar-tailed Godwit and Red Knot are always difficult to catch in good numbers but the samples obtained are considered sufficient to classify breeding success. The standout result was the 46.7% juvenile Curlew Sandpipers. A similar exceptionally high figure was obtained from north-west Australia and a similar figure was even reported from India. Curlew Sandpipers must therefore have had a breeding bonanza in the arctic summer of 2016 over a significant proportion of their breeding range. The figure means that nearly half the population in Australia during the non-breeding season was birds in their first year of life. A 40% juvenile ratio means that there were 1.3 juveniles still alive six months after the end of the breeding season for every adult breeding pair – a phenomenal reproduction rate for an arctic breeding wader! And quite unprecedented in any species monitored here in Australia over the last 39 years.

This statement might look peculiar if taken against the data for Red Knot, also included in Table 1. However, in the case of Red Knot the majority of young birds do not cross the Tasman Sea during their first year of life to join the large populations of adults in New Zealand. Instead the birds remain in south-east Australia, thus augmenting the juveniles figures, before crossing to their long-term non-breeding area in New Zealand at the beginning of their second year. Bar-tailed Godwit show the same behaviour but not to quite the same magnitude. Thus the norms to which we compare percentage juvenile figures are higher than might be expected in these two species, especially in the Red Knot.

Ruddy Turnstone and Red-necked Stints which spend the non-breeding season in south-east Australia also had an excellent breeding season in the 2016 arctic summer. However, Bar-tailed Godwit percentage juvenile figures were below average. Although the sample was small, it appears Sharp-tailed Sandpipers did not breed well either.

North-west Australian wader populations also had a much better breeding year in the 2016 arctic summer compared with the previous year. Again Curlew Sandpipers and Ruddy Turnstone stood out, as in south east Australia. Unfortunately Great Knot had another relatively poor breeding year. Red-necked Stint populations wintering in north-west Australia appear to have had a poorer arctic breeding season than those wintering in south-east Australia.

A feature of the north-west Australian data is that all three species which have breeding areas slightly below the arctic region had particularly poor breeding outcomes. This is especially unfortunate for Greater Sand Plovers and Terek Sandpipers which have now had two consecutive poor breeding seasons.

CONCLUSION

The improvement for most wader populations in their breeding success in the arctic summer of 2017, compared with the 2016 arctic summer, is very pleasing to note. However it will require many more good breeding seasons to restore the worst of the population losses which have been recorded in The East Asian-Australian Flyway in the last 20 years.

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Table 1. Percentage of juvenile (first year) waders in cannon-net catches in south-east Australia 2016/2017.

Species	No. of catches			Juveniles		Long term median* % juvenile (years)	Assessment of 2016 breeding success
	Large (>50)	Small (<50)	Total caught	No.	%		
Red-necked Stint <i>Calidris ruficollis</i>	4	4	2671	837	31.3	17.0 (38)	Very Good
Curlew Sandpiper <i>C. ferruginea</i>	1	3	344	164	47.6	10.6 (37)	Exceptional
Bar-tailed Godwit <i>Limosa lapponica</i>	0	1	24	3	12.5	16.5 (27)	Below Average
Red Knot <i>C. canutus</i>	0	2	31	28	90.3	65.5 (20)	Very Good
Ruddy Turnstone <i>Arenaria interpres</i>	1	18	506	145	28.6	10.5 (26)	Very Good
Sanderling <i>C. alba</i>	1	0	143	25	17.5	12.6 (25)	Good
Sharp-tailed Sandpiper <i>C. acuminata</i>	0	1	13	1	(7.7)	14.8 (34)	(Very Poor)

All birds cannon-netted in the period 2th November to 25th March except Sharp-tailed Sandpiper and Curlew Sandpiper to end February only and some Ruddy Turnstone and Sanderling to early April and one Sanderling catch in late April (2015) .

*Does not include the 2016/2017 figures.

Table 2. Percentage of juvenile (first year) waders in cannon-net catches in north-west Australia in 2016/2017.

Species	No. of catches		Total caught	Juveniles		Assessment of 2016 breeding success
	Large (>50)	Small (<50)		No.	%	
Great Knot <i>Calidris tenuirostris</i>	5	7	553	50	9.0	Below Average
Bar-tailed Godwit <i>Limosa lapponica</i>	1	5	182	20	11.0	Average
Red-necked Stint <i>C. ruficollis</i>	3	6	390	67	17.2	Average
Red Knot <i>C. canutus</i>	1	5	97	21	21.6	Good
Curlew Sandpiper <i>C. ferruginea</i>	1	7	149	60	40.3	Exceptional
Ruddy Turnstone <i>Arenaria interpres</i>	0	5	25	9	36.0	Very Good
Non-arctic northern migrants						
Greater Sand Plover <i>Charadrius leschenaultii</i>	4	6	715	87	12.4	Very Poor
Terek Sandpiper <i>Xenus cinereus</i>	0	7	120	7	5.8	Very Poor
Grey-tailed Tattler <i>Heteroscelus brevipes</i>	1	10	228	33	14.5	Below Average

All birds cannon-netted in period 1 November to mid-March

Table 3. Percentage of juvenile birds in wader catches in south-east Australia 1998/1999 to 2016/2017.

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	11/12	12/13	13/14	14/15	15/16	16/17	Average (19yrs)
Ruddy Turnstone <i>Arenaria interpres</i>	6.2	29	10	9.3	17	6.7	12	28	1.3	19	0.7	19	26	10	2.4	38	17	2.3	28.6	14.0
Red-necked Stint <i>Calidris ruficollis</i>	32	23	13	35	13	23	10	7.4	14	10	15	12	20	16	22	17	19	6.0	31.3	16.9
Curlew Sandpiper <i>C. ferruginea</i>	4.1	20	6.8	27	15	15	22	27	4.9	33	10	27	(-)	4	3.3	40	5.1	1.9	47.6	15.7
Sharp-tailed Sandpiper <i>C. acuminata</i>	11	10	16	7.9	20	39	42	27	12	20	3.6	32	(-)	5	18	19	16	8.9	-	18.0
Sanderling <i>C. alba</i>	10	13	2.9	10	43	2.7	16	62	0.5	14	2.9	19	21	2	2.8	21	14	6.8	17.5	14.5
Red Knot <i>C. canutus</i>	(2.8)	38	52	69	(92)	(86)	29	73	58	(75)	(-)	(-)	78	68	(-)	(95)	(100)	(100)	90.3	58.1
Bar-tailed Godwit <i>Limosa lapponica</i>	41	19	3.6	1.4	16	2.3	38	40	26	56	29	31	10	18	19	45	15	26.7	12.5	24.0

All birds cannon-netted between 15th November and 25th March, except Sharp-tailed Sandpiper and Curlew Sandpiper to end February only and some Ruddy Turnstone and Sanderling to early April and one Sanderling catch in late April (2015). Averages (for previous 18 years) exclude figures in brackets (small samples) and exclude 2016/2017 figures

Table 4. Percentage of first year birds in wader catches in north-west Australia 1998/1999 to 2016/2017

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	11/12	12/13	13/14	14/15	15/16	16/17	Average (18yrs)
Red-necked Stint <i>Calidris ruficollis</i>	26	46	15	17	41	10	13	20	21	20	10	17	18	24	15	19	10	11.1	17.2	19.6
Curlew Sandpiper <i>C. ferruginea</i>	9.3	22	11	19	15	7.4	21	37	11	29	10	35	24	1	1.9	23	18	0.7	40.3	16.7
Great Knot <i>C. tenuirostris</i>	2.4	4.8	18	5.2	17	16	3.2	12	9.2	12	6	41	24	6	6.6	5	6	5.7	9.0	11.3
Red Knot <i>C. canutus</i>	3.3	14	9.6	5.4	32	3.2	(12)	57	11	23	12	52	16	8	1.5	8	13	2.7	21.6	16.1
Bar-tailed Godwit <i>Limosa lapponica</i>	2.0	10	4.8	15	13	9.0	6.7	11	8.5	8	4	28	21	8	7.6	17	5	10.3	11.0	10.8
Non-arctic northern migrants																				
Greater Sand Plover <i>Charadrius leschenaultii</i>	25	33	22	13	32	24	21	9.5	21	27	27	35	17	19	28	21	20	10.5	12.4	22.7
Terek Sandpiper <i>Xenus cinereus</i>	12	(0)	8.5	12	11	19	14	13	11	13	15	19	25	5	12	15	12	9.2	5.8	13.4
Grey-tailed Tattler <i>Heteroscelus brevipes</i>	26	(44)	17	17	9.0	14	11	15	28	25	38	24	31	20	18	16	19	8.9	14.5	19.8

All birds cannon-netted in the period 1 November to mid-March. Averages (for previous 18 years) exclude figures in brackets (small samples) and exclude 2016/2017 figures