

WADER CONFERENCE : LIVERPOOL POLYTECHNIC 21-24 August 1975

This conference for those people actively working on waders is to be held between 21st and 24th August. It is open to all and it is hoped that as many amateurs as possible will be able to attend. An outline of the sessions is set out below to give some idea of the content.

21st August assemble during the evening

22nd August A.M. Winter Feeding Ecology, including talks from specialists from The Netherlands.

P.M. Breeding biology and feeding during the breeding season. Including several basic talks on British populations (Curlew, Ringed Plover, Redshank) the details of which have not been presented before. Also breeding of Stints in Finland.

23rd August A.M. Carry capacity and numbers. Summaries of local and national studies which tie in with migration/population studies.

P.M. Geographical variation, including talks on Dunlin, Ringed Plover and Tringa sp. which should have relevance for ringers.

24th August will be spent on the Ribble looking at the research areas and even birds.

If you would like to attend the conference please contact Dr.W.G.Hale (Liverpool Polytechnic, Department of Biology, Byron Street, Liverpool L3 3AF) for further details of the programme and prices (which are very reasonable).

Notes on the Weights and Biometrics of Purple Sandpiper in Eastern Scotland.

Norman Atkinson, Ron Summers and Mike Nicoll.

The Purple Sandpiper Calidris maritima is one of the poorer ringed of the wader species. Only 735 had been ringed in Britain up until 1973 (Spencer, 1975). Difficulty in capture and their sparse distribution are presumably the causes of this situation. As a result, little is known about the migrations of this species.

In 1967 we found that small samples could be caught by torch light on the Isle of May Bird Observatory despite various encounters with Grey Seals, but attempts to repeat these successes on the mainland shores usually ended in failure. As a result we have continued to visit the Isle of May on a regular basis and 234 have now been ringed. In late 1972 the May R.G. acquired a cannon net and it was found that about 10% of the 3000-4000 Purple Sandpipers present on the east coast were in cannon-nettable sites at some part of the year. In the succeeding 2 years 152 were ringed. This gives a combined total of 386 to the end of 1974.

.../

The following article is a presentation of an initial analysis of our data collected between 1967 and May 1974.

### Recoveries

There are four foreign ringing recoveries. Two ringed in September 1969 on the Isle of May were recovered on the Norwegian breeding grounds, one in July 1970 was shot with its young, and the other in June 1974. One ringed in August 1968 at Revtangen (on the Norwegian coast) was controlled in December 1973 on the Isle of May. A pullus ringed in Norway in June 1949 was recovered in Aberdeenshire in Jan. 1950.

### Weight

The birds were weighed to the nearest gm. at the time of capture. The seasonal changes can be seen in table 1. Both adults and first year birds show a relatively stable weight through late autumn, winter and early spring. First year birds are slightly lighter, but this is not a significant difference for the months of December ( $t = 0.79$  p 70.1) and March ( $t = 1.65$  p 0.1) when good samples of both age groups were obtained. In early May there is a sharp increase in weight presumably due to fat deposits for migration to the breeding grounds. The main exodus is not until 10 - 25 May so the weights attained prior to departure may be in excess of that seen on the 4 - 6th. It is of interest that the first years also prepare for migration, bearing in mind there is a summering population.

	ADULT				FIRST YEAR			
	Mean	SD	Range	n.	Mean	SD	Range	n.
Oct	64.1	5.2	54-77	49	59.1	4.3	55-67	7
Dec	63.5	7.2	52-73	60	62.3	7.1	52-77	32
March	64.8	8.1	51-81	58	61.6	6.4	52-73	23
Apr	62.7	6.9	53-85	72	64.1	6.2	53-75	16
May (4-6th)	74.4	9.6	63-92	23	80.0		68-90	3

TABLE 1 The mean weights (gms.) of adult and first year Purple Sandpiper in eastern Scotland. Standard deviations, ranges and sample sizes are also given.

### Biometrics.1. Bill Length

In all months the frequency distributions for bill lengths were bimodal, centred consistently on 25-26 mm. and 29-30 mm. for adults and on 26 mm and 28-30 mm. for first year birds. The data for all months has therefore been lumped (Fig.1.). This bimodality is known to be due to sexual dimorphism (Witherby et al. 1943) and this was confirmed in a collected (under licence) sample where males had a bill length of  $26.4 \pm 2.7$  (range 23-30, n = 9) and females  $30.2 \pm 2.0$  (range 28-34, n = 12). However, analysis of the data in figure 1 by the graphical inflexion method gave some interesting and conflicting results. Figure 2 shows the percentage cumulative frequency (PCF) curve for adults (kinked line) and the calculated population lines for the "males" (left) and "females" (right). The line for the "males" shows a normal distribution with a mean of 25.4 and SD of 1.1.

This mean (25.4) lies within the 95% confidence limits of the mean in the collected sample (24.3 - 28.6), but the SD (1.1) is approximately half of that of the collected sample. The variance ratio ( $F = 6.0$ ) shows that the standard deviations are significantly different ( $p = 0.001$ ).

The population line for the "females" was even more puzzling as it was found to be skewed to the right, though where the curve does pass through the 50% mark (29.9 mm.) it is close to the mean in the collected sample (30.2 mm.).

Graphical analysis of the first year bills gave similar results with calculated means of 25.5 and 29.7 mm. for "males and females" respectively. Also the "males" appeared to be normally distributed whilst the "females" were skewed.

There are two possible explanations for this situation.

(1) The distributions for both males and females could be skewed towards their upper end (Fig 3a). The tail in the male distribution being masked by the females so that the distribution appears normal in the graphical analysis. (2) There are 2 populations involved with small-billed birds in the majority. (Fig 3b). The slight peak at 34 mm. in figure 1 may represent females of a different population.

#### Biometrics.2. Wing length

Before describing the wing lengths, any decrease in wing length in the inter-moult period, as found in the Knot (Pienkowski and Minton, 1973), must be accounted for. All birds measured twice within this period were examined. These included birds from mid October (80% have completed moult by this date) to May. As yet, we have no birds which have been measured before and after the breeding season. 8 of the 21 birds increased in length, 7 remained constant and 6 decreased (Fig 4). It therefore appears that the wing length remains constant between October and May, the deviations being due to measuring variability. What then is the reason for the difference between the Purple Sandpiper and Knot? Perhaps it is related to differences in mobility, which possibly results in abrasion of the wing tips. Knots carry out regular winter movements (Minton 1971) whilst our data suggest that Purple Sandpipers remain on a limited stretch of coastline throughout the non-breeding season, and are not very prone to flight.

When frequency distributions for wing length in the different months were drawn, no bimodality was apparent so the data are described by a single mean (Table 2). The consistency of the means between October and May supports the conclusion that wing lengths do not decrease. However, the mean length in August is 3-4 mm. less, suggesting that there is wear due to migration, but larger samples are required to confirm this. Certainly at this time the wing tips are abraded.

The wing lengths of first year birds are 2-3 mm. shorter. This difference was significant for the 3 months that were tested;  $t = 2.44$   $p = 0.05$  for December;  $t = 3.70$   $p = 0.001$  for March; and  $t = 2.83$   $p = 0.01$  for April.

**TABLE 2** The mean wing lengths (mm.) (maximum chord) of adult and first year Purple Sandpipers in eastern Scotland.

	ADULT				FIRST YLAR			
	Mean	SD	Range	n	Mean	SD	Range	n
Aug	127.3	2.1	125-131	6	Insufficient data			
Oct	130.6	3.1	123-136	42	Insufficient data			
Dec	130.2	3.7	123-140	60	128.3	3.8	121-136	32
Mar	132.3	4.5	122-141	58	128.9	3.4	122-136	23
Apr	130.3	3.7	124-141	72	127.5	2.8	123-132	16
May	131.7	4.3	125-136	23	Insufficient data			

### Biometrics.3. Comparisons with other areas

Because of the problems of comparing present day data on maximum wing chords of fresh birds with past published data where the type of measurement taken and condition of the bird are not stated, no conclusions could be made. Bill measurements, however, are standard and useful comparisons can be made.

Løvenskjold (1954) gives a list of measurements for Spitsbergen - breeding birds (Fig 5 (2)) whose average for males ( $28.2 \pm 1.9$ ,  $n = 20$ ) and females ( $32.1 \pm 1.3$ ,  $n = 24$ ) differ significantly from our Scottish data (Fig 5 (1)) ( $t = 2.1$   $p = 0.05$  for males and  $t = 5.4$   $p = 0.001$  for females). It can be concluded that Spitsbergen birds do not winter in eastern Scotland. Little can be made of Ogilvy and Taylor's (1977) Spitsbergen data for they give a single mean  $\pm$  SD for a sample which, judging from Løvenskjold's (1954) data, would have been bimodal. Less complete data are available for the breeding birds of Iceland (Timmermann, 1938) and Canada (Godfrey 1966) Fig 5(5) and (3)) but it would appear that neither formed major components of the eastern Scottish population.

Salmonsén (1950) gives no bill lengths for Greenland breeding birds but the wing length data he quotes for various populations suggests that Greenland birds are very slightly smaller than Scandinavian breeders. His statement though, that 'bill length is a reliable sexual characteristic, being 32 mm. and over in females while practically all males in all populations have bills shorter than this measurement,' requires modification in light of the more recent data.

The Fair Isle (north Scotland) data (Fig 5 (6)) is of interest as it suggests that these birds belong to the long-billed Icelandic-breeding population.

Morrison and Wilson (1972) caught birds on the coast of Iceland in May (Fig 5 (7)) and pointed out the similarity between their and Timmermann's (1938) data.

The birds caught by the 1974 Oxford-Varangerfjord Expedition were caught in Aug/Sept and several were in moult (Fig 5 (4)). They may not have originated from the local population in northern Norway.

Summary

Norwegian breeding birds are known to occur in eastern Scotland and they probably form the bulk of this population. The possibility of other populations being present cannot be excluded, though neither Canadian, Icelandic, nor Spitsbergen birds will form a major component of the eastern Scottish populations. Wing lengths remain constant between October and May. First year birds are 2-3 mm. shorter in the wing. Weight is stable through late autumn, winter and early spring. Both adults and first years put on weight for migration in early May and departure occurs in mid May.

Acknowledgements

We should like to thank other Tay R.G. members who helped in the trapping sessions. Also, thanks go to R. Broad of Fair Isle B.O. and K. Lessels of the Oxford-Varangerfjord Expedition for access to Fair Isle and Norwegian data respectively.

References

- Godfrey, W.L. 1966 The Birds of Canada. Ottawa
- Lóvenskjöld, H.L. 1954 Studies of the avifauna of Spitsbergen. Norsk Polarinstitutt Skrifter 103 : 62-69
- Minton, C.D.T. 1971 Wash Wader Ringing Group Report, 1970
- Morrison, R.I.G. & Wilson, J.R. 1972 Cambridge Iceland Expedition 1971 Report. Cambridge
- Ogilvy, M.A. & Taylor, R.J.F. 1967 Summer records from West Spitsbergen 1964. Ibis 109 : 299-309
- Pienkowski, M.W. & Minton, C.D.T. 1973 Wing length changes of the Knot with age and time since moult. Bird Study 20:63-68.
- Salomonsen, F. 1950 The Birds of Greenland, Kobenhaven
- Spencer, R. 1973 Report on Bird-ringing for 1971. Bird Study 20 : Special Supplement
- Timmermann, G. 1938 Die Vogel Islands Reykjavik
- Witherby, H.F., Jourdan, F.C.R., Ticehurst, N.F., & Tucker, B.W. 1943 The Handbook of British Birds London