

Arenaria interpres and Purple Sandpipers showed little change in numbers, amounting to the variation one might expect between observers counting on the same day (Table 1). In Angus only one observer counted on both days (B-D Table 2). Numbers of Oystercatchers and Purple Sandpipers fell whilst those of Knots *Calidris canutus* increased. The Oystercatchers may have gone to nearby fields, but the change in numbers of Purple Sandpipers and Knots was more than would be expected from errors in counting, so must be due to movements from neighbouring shores.

CONCLUSIONS

Repeat counts of waders along short sections of rocky coast in Orkney and Angus have shown and measured the extent of the problem in attempting to obtain estimates of the numbers of waders on rocky shores at low tide. Imprecise and inaccurate results can result if waders occur at shore levels where the observer is not walking, if waders are bunched into large mixed-species flocks, and if an observer is inexperienced. Also several species (Oystercatcher, Lapwing, Golden Plover, Redshank and Curlew) alternate between rocky shores and fields, making it difficult to get representative data. This problem has been noted before (da Prato & da Prato 1979a; Summers & Buxton 1983). Day to day, and presumably week to week, variations in numbers are also greatest in those species which use inland fields, but can affect species like the Purple Sandpiper which is restricted to the shore. This paper has tended to emphasise some of the problems associated with counting rocky shores. However, day to day variations

associated with short-distance movements along the shore can be overcome by surveying a long section of coastline, preferably by a team working simultaneously. Standardised techniques should yield comparable results from different sections of coastline.

REFERENCES

- Atkinson, N.K. 1971. Purple Sandpipers and Turnstones in Angus. *Tay Ringing Group Report* 1971:7.
- Atkinson, N.K., Summers, R.W., Nicoll, M. & Greenwood, J.J.D. 1981. Population, movements and biometrics of the Purple Sandpiper *Calidris maritima* in eastern Scotland. *Ornis Scand.* 12: 18-27.
- da Prato, E.S. & da Prato, S.R.D. 1979a. Wader counting on rocky shores of East Lothian. *Scottish Birds* 10: 184-186.
- da Prato, E.S. & da Prato, S.R.D. 1979b. Counting wintering waders on rocky shores in East Lothian, Scotland. *Wader Study Group Bull.* 25: 19-23.
- Summers, R.W., Atkinson, N.K. & Nicoll, M. 1975. Wintering wader populations on the rocky shores of eastern Scotland. *Scottish Birds* 8: 299-308.
- Summers, R.W. & Buxton, N.E. 1983. Winter wader populations on the open shores of northern Scotland. *Scottish Birds* 12: 206-211.
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LATE RINGING TOTALS FOR 1983

The following ringing totals were received too late for inclusion in the listing in *Bulletin* 40. This listing covers the period January - December 1983, as did that in *Bulletin* 40. Totals in brackets are pulli (chicks), where these were reported separately from fully-grown birds.

| | | A | B | C | D |
|----------------------|--------------------------------|--------|--------|----|----|
| Oystercatcher | <i>Haematopus ostralegus</i> | | 1 | | |
| Little Ringed Plover | <i>Charadrius dubius</i> | | 19(1) | | |
| Ringed Plover | <i>Charadrius hiaticula</i> | (1) | 2 | | |
| Kentish Plover | <i>Charadrius alexandrinus</i> | 6(1) | | | |
| Grey Plover | <i>Pluvialis squatarola</i> | | | 23 | |
| Lapwing | <i>Vanellus vanellus</i> | | 41(52) | | |
| Knot | <i>Calidris canutus</i> | | | 3 | |
| Little Stint | <i>Calidris minuta</i> | | 13 | | |
| Temminck's Stint | <i>Calidris temminckii</i> | | 1 | | |
| Curlew Sandpiper | <i>Calidris ferruginea</i> | | 2 | | |
| Dunlin | <i>Calidris alpina</i> | 28(21) | 11 | 11 | |
| Ruff | <i>Philomachus pugnax</i> | | 48 | 1 | |
| Common Snipe | <i>Gallinago gallinago</i> | | 147 | 1 | |
| Black-tailed Godwit | <i>Limosa limosa</i> | | 28 | 51 | |
| Bar-tailed Godwit | <i>Limosa lapponica</i> | | | 1 | |
| Whimbrel | <i>Numenius phaeopus</i> | | 1 | | |
| Curlew | <i>Numenius arquata</i> | | | 8 | |
| Spotted Redshank | <i>Tringa erythropus</i> | | 12 | | |
| Redshank | <i>Tringa totanus</i> | | 7(1) | 14 | |
| Greenshank | <i>Tringa nebularia</i> | | 49 | | |
| Green Sandpiper | <i>Tringa ochropus</i> | | 25 | | |
| Wood Sandpiper | <i>Tringa glareola</i> | | 27 | | |
| Common Sandpiper | <i>Actitis hypoleucos</i> | | 22 | | |
| Spotted Sandpiper | <i>Actitis macularia</i> | | | | 55 |

A = Paul E. Jonsson: Foteviken Bay and Falsterbo Peninsula, SW Scania, Sweden; B = OAG Münster: Sewage farms of Münster, Federal Republic of Germany; C = Office National de la Chasse (Section Oiseaux d'eau): Baie de l'Aiguillon, Vendée, France; D = Lewis W. Oring: Little Pelican Is., Leech Lake, Minnesota, U.S.A.