

## WADER MIGRATION IN THE UPPER FORTH ESTUARY

by I R Taylor

### Introduction

This paper describes the migrations of ten species of wader through a study area in the upper Forth estuary. The species examined are those that occurred in the study area only on passage; species that neither bred nor wintered in the area. The migrations of a few of these have been described from sites in Northumberland (Brady 1949, Evans 1966) but for most the only other published information is from sites far to the south of the Forth; in Cambridge (Nisbet 1957), Leicestershire (Mason 1969) and South Glamorgan (Ingram 1945).

The paper is concerned mainly with the timing of the migrations and these are compared with the timings recorded at the study sites mentioned above. Detailed observations of timing often reveal the passages of different populations of single species and subsequent ringing may determine their origins. Different populations may also move through the country by different routes. Studies from as many sites as possible throughout the country, although repetitive, may thus be very valuable in the understanding of these movements.

Observations of migration in progress are, of course, rare and this study like the previous ones relies on counting birds resting or feeding at a particular site. This method has many drawbacks. The absence of a species on the ground does not necessarily mean the absence of migration over the study area; the feeding habitat may simply be unsuitable. Similarly the total numbers involved in a movement cannot be safely deduced from the numbers on the ground. However, despite the difficulties these studies do provide useful preliminary information for subsequent intensive ringing studies.

### Study area and methods

The study area consisted of a number of permanent, shallow pools in fields on the south side of the Forth estuary, north of Grangemouth (Figure 1). The Forth at this point forms extensive mudflats which support large populations of migrant and wintering waders. The study pools were within a few hundred yards of these flats, separated from them by a protective embankment. Most of the species included in the study fed only on the pools but a few also fed on the flats. Tidal variations in the numbers of these species on the pools were eliminated as much as possible by counting at high tide.

Counts were made by moving systematically from pool to pool trying as far as possible to leave the birds undisturbed. However when other bird watchers were present the birds were nearly always frightened from one pool to the next and in these cases counts were also made of birds in transit. These were subsequently added to or subtracted from the total counts depending upon the direction of their movement.

In the case of the Whimbrel the counts were of birds actually on passage and flying over the area. They rarely settled in the study area. These counts would obviously be time dependent but all visits to the study area lasted approximately two hours so there was little bias through inconsistency.

The observations were made over a period of six years, from 1964 to 1970, excluding 1968, during which a total of 337 visits were made to the study area.

## Results

### Oystercatcher Haematopus ostralegus

A few birds were recorded in spring but there was no evidence of a regular passage (Table 1). Andrew (1959) found no regular spring passage through Midlothian and suggested that the birds entered the Forth area through the Forth/Clyde valley. From the present study this does not seem to be the case. Brady similarly found no spring passage through Northumberland and both Nisbet and Mason found them scarce in Cambridge and Leicestershire respectively.

Autumn passage was well pronounced starting in early July and reaching a peak during the first half of August. Few birds were seen after the end of August (Table 1). Andrew recorded a similar passage time through Midlothian but in Northumberland Brady recorded an additional movement in September. It is possible that these late birds move directly down the east coast and do not come west into the Forth area.

### Ringed Plover Charadrius hiaticula

The Ringed Plover was one of the few species that showed a marked spring passage through the area. Most of this took place during the first half of May, when large flocks of up to 100 birds were regularly seen, but a small number were still passing through up to the beginning of June (Table 1). Brady, Nisbet, Evans and Mason all recorded a passage in May. However Brady and Nisbet also recorded an apparently smaller passage occurring mostly in late March, which was absent in the present study.

The autumn passage occurred mostly during the second half of August although a few birds were moving through as early as the beginning of July (Table 1). Numbers were nearly always much less than those recorded during the spring passage but it is impossible to be certain whether the total number of birds involved was actually less or whether they simply moved through more quickly. Brady, Nisbet and Mason all recorded an additional passage during late September not recorded in this study.

Evans (1966) suggested that the birds involved in the May and August passages bred in either Iceland or Greenland. Recent evidence supports this view. A sample of Ringed Plovers caught at Fife Ness on 18th August 1973 had wing lengths corresponding to those of arctic breeding birds (Summers 1974). During the summer of 1974 a number of Ringed Plovers were marked with plumage dye and colour rings in N.E. Greenland. Several of these were subsequently sighted on passage through the British Isles during late August and early September. Also 2 birds found in Greenland were wearing British rings; one had been caught on passage through Britain in late May, the other in late August (Green 1974).

### Whimbrel Numenius phaeopus

There was a distinct spring passage usually involving only a small number of birds during the first half of May (Table 1). Nisbet recorded a passage through Cambridge at almost exactly the same time but Mason found the movements through Leicestershire to be much earlier, mostly during April. Brady described them as common in small numbers during May in Northumberland.

Autumn passage started in early August and reached a peak during the second half of the month. There was then a rapid decline in numbers throughout September by the end of which most of the passage was over (Table 1). This agrees closely with the movements noted by Mason but rather surprisingly they do not agree with Brady's observations in Northumberland. He stated that the passage there reached a peak at the end of July. Nisbet found whimbrels to be very rare in Cambridge during autumn.

Month	Number of Counts	Oyster-catcher	Ringed Plover	Whimbrel	Black-tailed Godwit	Common Sand-piper	Spotted Redshank	Green-shank	Little Stint	Curlew Sandpiper	Ruff
February	8	0	0.38(3)	0	0	0	0	0	0	0	0.13(1)
March	9	0	0.44(4)	0	0.22(2)	0	0	0	0	0	0.11(1)
	4	0.50(2)	1.00(4)	0	0	0	0	0	0	0	4.50(18)
April	11	0	2.27(25)	0	0	0	0	0	0	0	0
	8	0.38(3)	0.88(7)	0	0	0	0	0	0	0	0
May	17	0	48.06(817)	1.00(17)	0	0.18(3)	0	0	0	0	0
	9	0	7.67(69)	0	0	0	0	0	0	0	0
June	18	0.06(1)	4.33(78)	0.17(3)	0	0	0	0	0	0.06(1)	0
	9	0.33(3)	0	0	0	0	0	0	0	0	0
July	26	1.35(35)	1.20(31)	0	0.46(12)	1.30(34)	0	0.08(2)	0	0	0.15(4)
	23	6.00(138)	2.35(54)	0	0.91(21)	2.17(50)	0	0.39(9)	0	0	0.87(20)
August	26	7.04(183)	1.19(31)	0.46(12)	0.50(13)	0.31(8)	0	1.96(51)	0	0	2.42(63)
	43	1.09(47)	15.80(679)	1.33(57)	1.72(74)	0.19(8)	0.72(31)	1.56(67)	0.21(9)	2.19(90)	8.14(350)
September	22	0.23(5)	0.36(8)	0.59(13)	1.23(27)	0.05(1)	0.27(6)	0.86(19)	0.77(17)	2.31(51)	6.77(149)
	16	0.13(2)	0	0.25(4)	3.31(5)	0	0.31(6)	0.50(8)	0.81(13)	2.44(39)	2.38(38)
October	18	0	0	0	1.00(18)	0	0.28(5)	0.05(1)	0.33(6)	0.72(13)	3.28(59)
	15	0	0	0	0.07(1)	0	0.27(4)	0	0.07(1)	0.47(7)	0.40(6)
November	11	0	0	0	0	0	0	0	0	0	0.27(3)

Table 1. Counts of Waders in the Study Area

The figures in brackets show the totals counted on all visits; the open figures show the mean number recorded per visit. The period from mid-November to mid-February has been omitted in the table as there were no sightings of any of the species during this time. For each month the upper figures refer to the first fifteen days and the lower figures the remainder.

Black-tailed Godwit Limosa limosa

There was no regular spring passage through the study area. Autumn passage was prolonged, starting at the beginning of July and continuing until mid October. Maximum numbers were recorded during the last two weeks of August and first two weeks of September (Table 1). This is about a month later than the main movements through Cambridge recorded by Nisbet. In Leicestershire Mason noted peak movements during August.

Common Sandpiper Tringa hypoleucos

There was no regular spring passage. Nisbet and Mason recorded spring movements during May in Cambridge and Leicestershire and Ingram noted a late April passage in Glamorgan.

Autumn passage began at the beginning of July and reached a peak during the second half of the month. There was a rapid decline in numbers during August and only one bird was recorded in September (Table 1). The passage through Cambridge recorded by Nisbet also started early in July but reached a peak somewhat later, in the first half of August, and continued into early October. Ingram also found an early August peak in Glamorgan but Mason found a peak in late August in Leicestershire.

Spotted Redshank Tringa erythropus

There was no spring passage. Autumn passage started about mid August and extended to the end of October. Maximum numbers were recorded during the second half of August (Table 1). Nisbet found an early September peak in Cambridge.

Greenshank Tringa nebularia

There was no spring passage. Nisbet and Mason found very small numbers in their study areas during May. Autumn passage started in early July and reached a peak in late August. Most birds had passed through by the end of September (Table 1). Nisbet and Mason also found late August peaks.

Little Stint Calidris minuta

There was no spring passage. Autumn passage stretched from mid August to mid October with peak numbers occurring during September (Table 1). This agrees closely with the movements recorded by Nisbet and Mason.

Curlew Sandpiper Calidris ferruginea

No spring passage. Autumn passage extended from mid August to the end of October with maximum numbers during August and September (Table 1). Nisbet recorded peak numbers during early September in Cambridge and Mason described a late September peak in Leicestershire.

Ruff Philomachus pugnax

Spring passage occurred almost entirely during the second half of March (Table 1). Nisbet recorded two passages, one during late March, the other in early May. Mason did not record a spring passage in Leicestershire. Autumn movements began in early July and extended into early November. Peak numbers occurred from mid August to mid September (Table 1). This agrees exactly with Nisbet's observations from Cambridge and with Mason's records from Leicestershire.

Overland movements of waders from the Forth

Using radar, Evans (1968) studies the overland passage of waders departing from Aberlady Bay in the Forth and found that they used three separate pathways. One of these was in a S.S.W. direction leading to the Ayrshire coast. During the course of the present study overland migration from the Forth around Grangemouth was regularly seen and heard from July to September. The direction was always approximately S.W. which would take the birds across central Scotland to the Ayrshire coast.

In late July and August Oystercatchers were seen using this route more frequently than any other species. Most of the movements occurred between about 8 o'clock in the evening and 7 in the morning. The birds were usually in flocks of between 20 and 70 individuals, frequently adopting a V formation and usually very noisy. Thus they were often heard flying over Falkirk (approx. 4 km S.W. of the Forth) during the hours of darkness. Such flights took place on dark overcast nights as well as on clear, light nights.

During September flocks of Curlews and Golden Plovers were frequently seen flying inland along the route and Richards (1965) observed influxes of these species to the Ayrshire coast during this month. Most of the movements of these species were at the same time of the day as those of the Oystercatcher and they were often heard flying over at night.

Six other species were seen flying inland but in much smaller numbers than those described above. Whimbrel and Ringed Plover were seen mostly in August. Greenshank, Bar-tailed and Black-tailed Godwits and Knot were seen during both August and September.

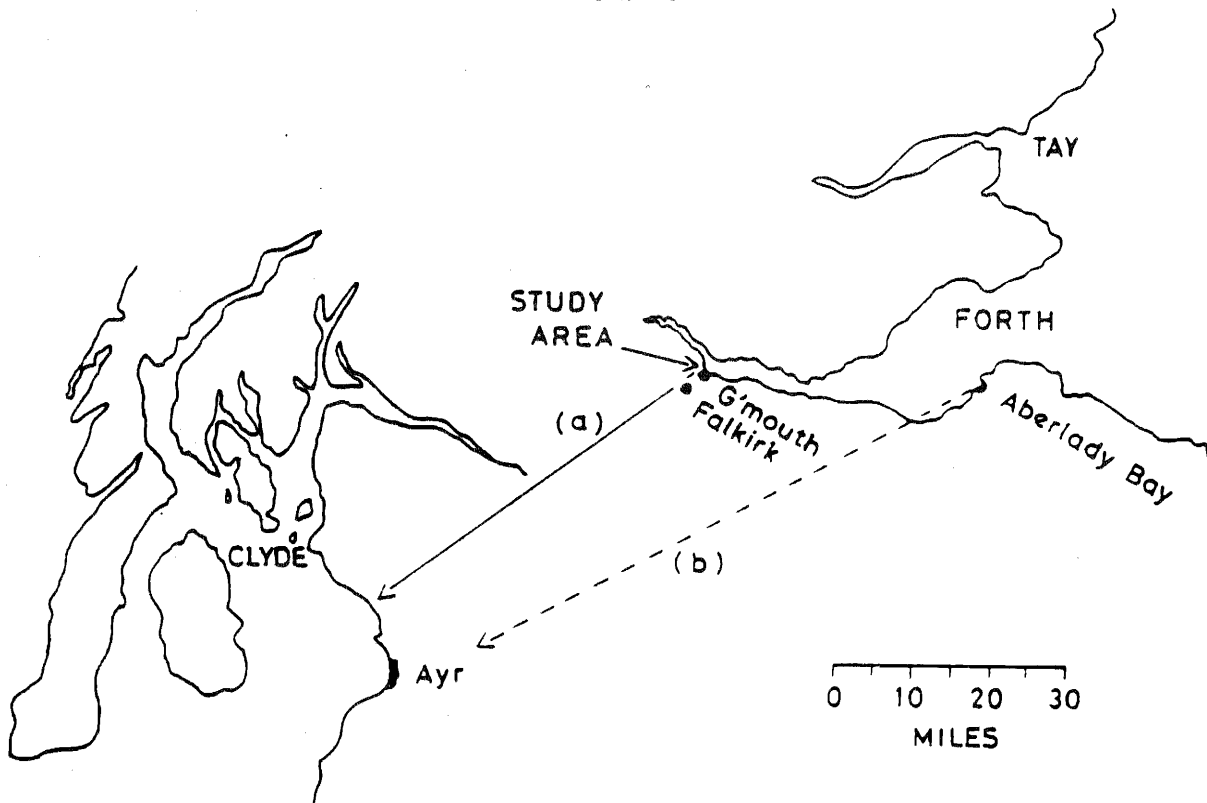


Figure 1. The position of the study area and the overland migration route from the upper Forth to the Ayrshire coast (a). The overland route from Aberlady to the Ayrshire coast recorded by Evans is also shown (b).

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1978 CAMBRIDGE NORWEGIAN EXPEDITION

During June and July 1978, a party of seven undergraduates from Cambridge University and one student from the Duncan Jordanstone College of Art, Dundee will be going to the Hardangervidda in southern Norway to study Purple Sandpipers Calidris maritima, Dotterels Eudromias morinellus and Dunlins Calidris alpina. As many adults and chicks as possible will be caught and ringed and in addition Purple Sandpipers and Dotterels will be colour-ringed. Detailed observations of these two species will be made in order to complement the work of Bengtson in Svalbard and Nethersole-Thompson in Scotland, both of whom were working with birds of a limited population.

Both projects are designed to link in with long-term studies presently being conducted by the Tay Ringing Group in east Scotland ; a Purple Sandpiper recovery from Finse on the Hardanger Plateau indicates that at least some of the birds wintering on the east coast of Scotland are probably from the Plateau population and it is hoped to confirm this with more definite evidence. In addition it will be interesting to compare the measurements of the breeding population with those obtained from wintering birds.

If any colour-ringed birds are seen we would be grateful if details could be sent to : A.J. Prater, BTO, Beech Grove, Tring, Herts, England.

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