

# WSG PROJECT ON THE MOVEMENT OF WADER POPULATIONS IN WESTERN EUROPE : EIGHTH PROGRESS REPORT

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## INTRODUCTION

As it is well over a year since an extensive progress report was published in the Bulletin, a brief resumé of the aims of the project is appropriate. In view of the increasing pressures on coastal shorebird habitats in western Europe, and the need to conserve networks of sites used by these birds, the Nature Conservancy Council (NCC) and the European Economic Community (EEC) Environment Programme have commissioned a research programme from Durham University, to be carried out in cooperation with the Wader Study Group.

The overall aims of the research programme are as follows:

1. To examine and analyse the evidence for movements of waders between different estuaries in western Europe, using existing data derived from recaptures of ringed birds, observations of colour-marked birds and measurements of birds caught for ringing studies.
2. To co-ordinate studies on the turnover and throughput of waders in western European estuaries, by devising dye-marking schemes for use in different sites, and by organizing an observer network to make systematic records of arrivals and departures of colour-marked birds.
3. To define the relative importance of different factors, in particular of weather conditions, of food resources and availability, and of bird social behaviour, in determining the numbers of each bird species present on an estuary.

This study involves the integration of intensive studies, especially at Teesmouth (and particularly relevant to item 3 above), with several existing extensive surveys and some new ones coordinated by the project team (see Evans 1980, Pienkowski 1980). The existing extensive surveys include (i) the national counts coordinated internationally by the International Waterfowl Research Bureau (eg in Britain, the Birds of Estuaries Enquiry); and (ii) the recoveries of national bird-ringing schemes, gathered centrally by Euring (the recoveries resulting from ringing in Britain and Ireland also being supplied directly by the British Trust for Ornithology (BTO)). Two further extensive surveys have been undertaken by WSG as part of the present project. One is the collection and computerization at Durham of the records of wader ringers throughout western Europe. This will allow incorporation, in this and future cooperative analyses, of information on catch totals, local recaptures and measurements of birds caught. The other is the visible marking programme, and associated network of observers, which is providing crucial information on within-year movements and the timing of these.

In this report, we first review the state of these various aspects of the project; second, give an example of some of the provisional results integrating these aspects; and third, outline work for the coming season, especially insofar as it relates to most project participants.

## PROGRESS IN ASSEMBLING THE DATA

### A. Ringing recoveries

The final magnetic tape detailing recoveries of waders ringed in Britain and Ireland was received from the BTO about two weeks before the writing of this report (July 1983). This completes our data-set of recoveries of British- and Irish-ringed shorebirds of the study species, from the start of ringing in 1909 up to and including 1981. Some minor sorting and checking remain to be done for some species to ensure no duplication between these records and those received earlier. However, since the magnetic tape was received, a start to some analyses has been possible, as reported below. We await the final magnetic tape, requested some months ago, from Euring but this is expected shortly. Receipt of this tape will allow the use by the project of as many recoveries from other European ringing schemes as have been computerized. Unfortunately, computerization has not been as systematic in most countries as in, for example, the Netherlands scheme and the British and Irish scheme. Therefore, not all records will be available for the other countries.

### B. Wader ringers' records

As explained in earlier reports, details of catch totals, of measurements of birds caught and of recaptures near the ringing site (which are not gathered centrally by most national ringing schemes) are essential to an assessment of the extent to which networks of sites are used by individual birds. Therefore, the present project involves the collection of original ringing (and recapture) data from individual ringers and groups, and transfer of this to computer files. The sites for which such information has been received are plotted on Figure 1. The clustering of points in various areas reflects the regional activities of particular ringers or groups. The extent to which the data available for each group have been transferred to computer files varies. For some groups, the task is complete; others are involved in checking the accuracy of the transferred data from print-outs supplied by us; whilst some (particularly those with large data-sets) are still involved also in recoding data from field records. The transfer of data to the computer and subsequent checking is being speeded by support from the Community Programme of the British government's Manpower Services Commission. This is funding the employment of one full-time and two part-time additional helpers. (This is in addition to the data punching personnel whose work is provided under the EEC contract by the University of Durham). This additional assistance will also allow us to arrange for the recoding of data by those few remaining groups who have not themselves been able to do this (see final section of this report).

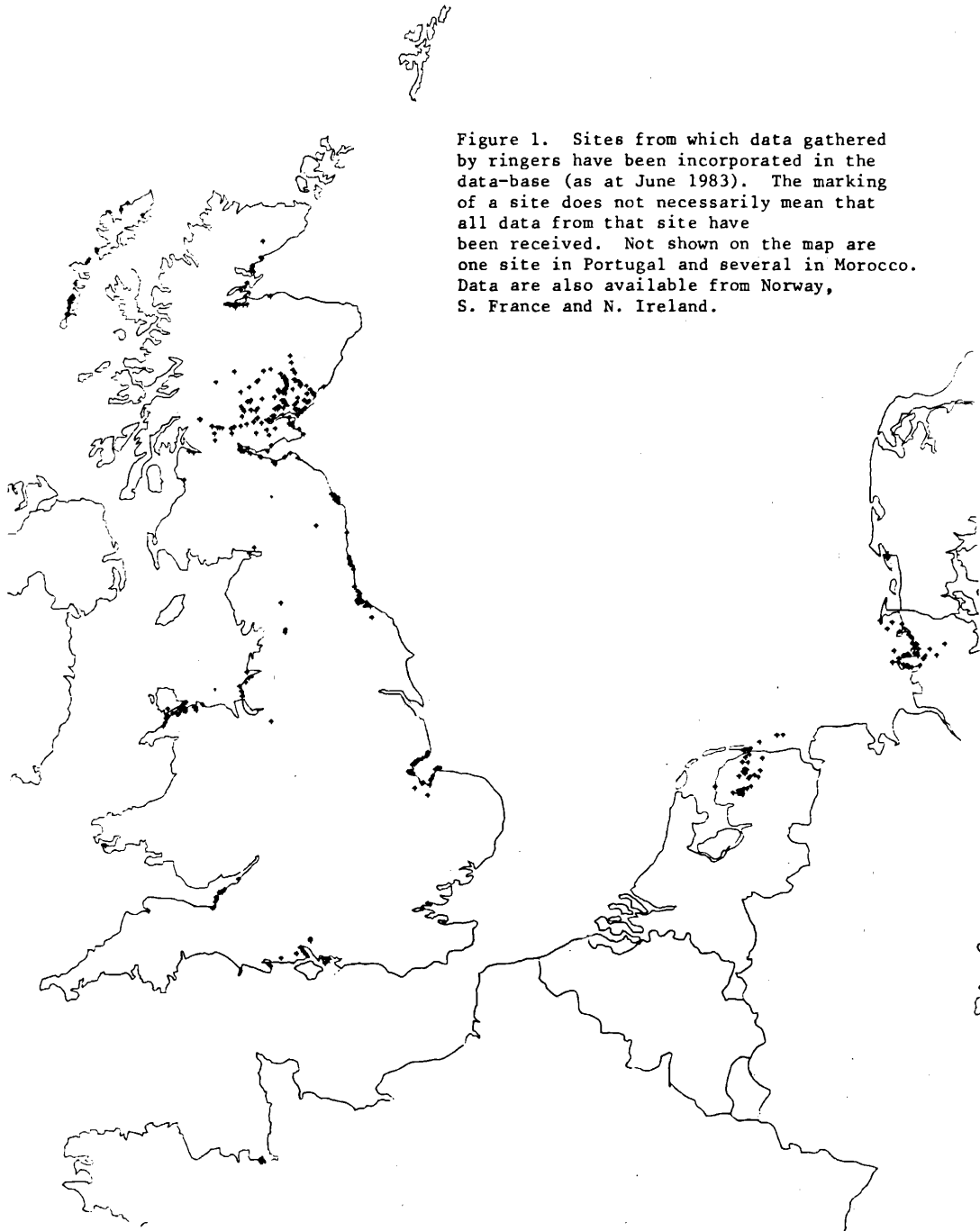


Figure 1. Sites from which data gathered by ringers have been incorporated in the data-base (as at June 1983). The marking of a site does not necessarily mean that all data from that site have been received. Not shown on the map are one site in Portugal and several in Morocco. Data are also available from Norway, S. France and N. Ireland.

### C. Visible marking programme

As in previous years, some of the time of the project personnel has been spent in coordinating for Europe the use of the limited number of colour-dye and other marks available, to allow concurrent work by researchers at particular sites, as well as in the areas of interest to the present project. The project continued to receive relevant information from related studies in return for acting as a 'clearing-house' for sightings for all.

Numerous examples of maps resulting from this aspect of the study have been shown in previous progress reports. In respect of the latest season of marking, the seventh progress report (Pienkowski & Pienkowski 1982) included summaries of the first results of marking in NW Wales and the Netherlands in autumn 1982. Further observations received later in the winter confirm the general pattern shown then. Further maps are included later in this report.

### D. Analysis

Computer programs for the analyses of these and other data have been further developed, notably for partly automated map production. Some examples of such maps are used in this report.

These automated analysis techniques have aided a rapid first look at some of the ringing recoveries recently received from the BTO. A combination of this preliminary investigation with results from other aspects of the project, including the dye-marking, formed a major part of a recent progress report on the project to the commissioning bodies, NCC and EEC. At the invitation of the Editor of WSG Bulletin, much of this material is incorporated in the present report to WSG members and other project participants. It should be noted that the present analysis is preliminary, both because of the short-time available since receipt of the recoveries, and also because incompleteness of data at present prevents the inclusion of recoveries from ringing outside the British Isles or the information obtained directly from ringers (see above).

A FIRST ASSESSMENT OF A MOVEMENTS NETWORK WITHIN THE NON-BREEDING SEASON: DUNLIN CALIDRIS ALPINA

A. Results from ringing recoveries

For the first analysis of the recently completed data-set of recoveries of British- and Irish-ringed waders, those of Dunlin, the most abundant coastal-wintering shorebird in the area, were examined. The analysis was restricted to birds which were ringed and recovered in the same non-breeding season (July to June). This restriction makes the data as comparable as possible with the results of the dye-marking programme reported in this and earlier progress reports. (Dunlin is probably the species with the most within-season recoveries, making it very useful for a first comparison of this nature. Previous work (eg Dugan 1981) has shown the number of within-season recoveries for several other species is very small indeed. This is one reason for the development of the visible marking programme.) It should be borne in mind that ringing recoveries are subject to considerable biases, due for example to differences in ringing effort in different places, years and seasons, similar differences in chance of recovery, and consequent interactions between these factors. Additionally, it should be remembered that only some of the recaptures near the marking area will have been reported. (This last problem should be largely solved when the data collection directly from ringers is completed.)

A total of 3578 recoveries of Dunlin had resulted by the end of 1981 from ringing in Britain and Ireland. Of these, 561 concerned recoveries in the same non-breeding season as that of ringing. This latter group is considered further below.

For the initial analysis, the non-breeding season was divided into 4 periods: July-August (approximating to early autumn migration), September-October (later migration and/or during moult), November-February (winter), and March to June (spring migration). Recoveries were examined from ringing in several areas of Britain: The Wash; SE England (Thames estuary and Essex & N Kent estuaries); S coast of England; Severn estuary and Bristol Channel; E Irish Sea; Moray Firth; Firth of Forth and Tay; and NE England.

Recoveries were sorted according to ringing area and pairs of time periods between period of ringing and period of recovery, eg both ringed and recovered within July-August; ringed in July-August but recovered in September-October; etc. Of course, not all of these area and time divisions provided sufficiently large samples for further analysis.

a) Within July-August. At several major estuaries, there seemed to be little onward movement within this period. This was true of The Wash (Fig. 2a) where, apart from one movement to northern France, all recoveries were local; SE England (Fig. 2b) from which only one Dunlin moved away - to The Wash - and the rest were local; and the E Irish Sea estuaries (Fig. 2c), from which there was one short movement to the Isle of Man but others were local. This situation was not unexpected for adults, as those from north European breeding grounds should have been starting their annual complete moults. However, the lack of movement of juveniles, despite several recoveries of young birds ringed at the Wash and in SE England is more surprising as these birds do not undergo a complete moult. Perhaps the

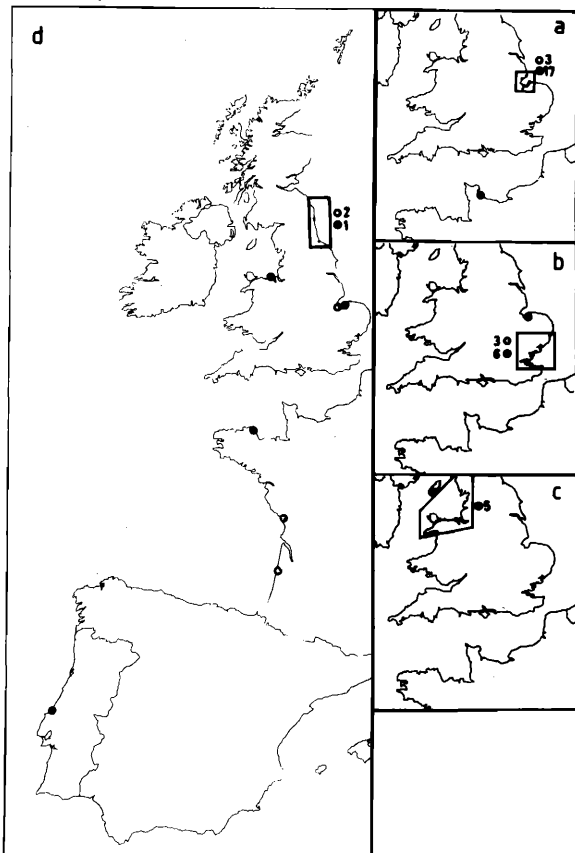


Figure 2. Reported recoveries in the same July-August period of Dunlins ringed in July-August at a) The Wash, b) SE England, c) E Irish Sea, and d) NE England. These marking areas are indicated by boxes, and the numbers of reported local recoveries noted alongside these. (Note that many local retraps made by the ringer may not have been reported.) Open symbols indicate birds identified as being in their first year of life; solid symbols indicate all other birds.

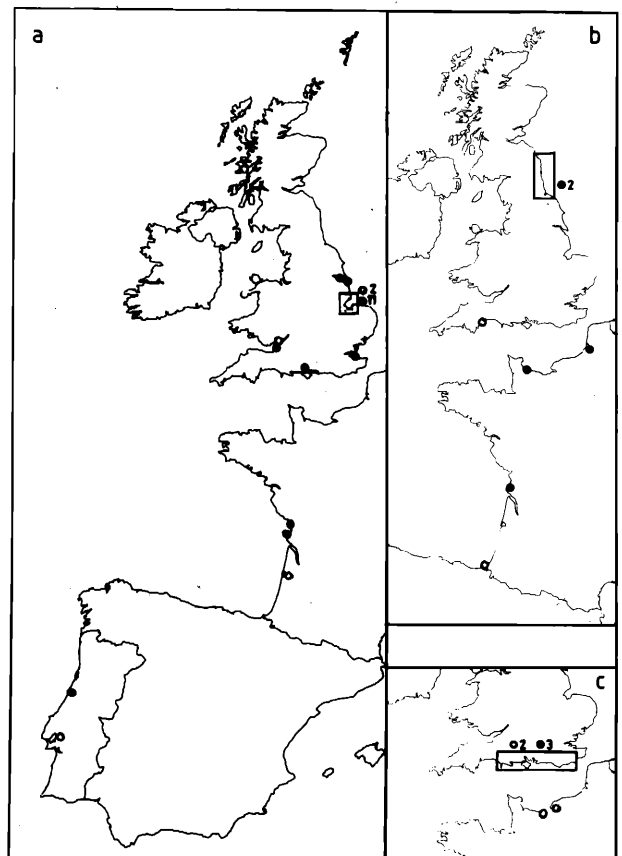


Figure 3. Reported recoveries in the following September-October of Dunlins ringed in July-August at a) The Wash, b) NE England, and c) S coast of England. Other details as for Fig. 2. Two birds in their first year and two adults recovered in Morocco and 1 first-year bird in Mauritania, all from The Wash, are not shown.

moulting areas of the adults are used by the young to continue growth of various body components or acquire feeding experience in coastal habitats, which are very different from many breeding areas, or to deposit reserves for onward migration - see below. The coast of NE England appears to fulfil a different function, that of a migration staging post for Dunlin. Several juveniles and adults ringed here were recovered within the same two-month period, some at the ringing site, some further south in Britain, and others in France and Portugal (Fig. 2d). Possibly there is some segregation in areas used by different Dunlin populations. Evans (1966) has suggested that the Dunlins using the Northumbrian coast at this time are mainly from Icelandic breeding areas (and therefore probably winter in NW Africa - Pienkowski and Dick 1976). Nothing is known of the movements of the large numbers of Dunlins using the Lindisfarne area of Northumberland as none have been caught there.

**b) Ringed in July-August and recovered in September-October.**

Some birds from both The Wash and NE England were recovered close to the ringing area, others elsewhere in Britain and several in France, Iberia and NW Africa (Fig. 3a,b). There was no obvious difference in distribution between recoveries of juveniles and adults. These data probably refer to birds of two groups: (i) those which come from the breeding populations of the temperate latitudes of Europe (and also Iceland) and which were probably caught whilst refuelling in Britain; and (ii) those of the N Eurasian-breeding population *C. a. alpina* which forms the W European-wintering population. Some of the latter may have undertaken relatively short post-moulting movements in October.

Birds ringed on the south coast of England have shown less extensive movements at this time of year (Fig. 3c), staying within the English Channel region. Possibly this part of England is less used by passage birds. It is notable that the influx of Dunlins from several sources to the French coast coincides with the start of the autumn-winter increase in numbers of Dunlins recorded at several French sites by regular counting (R. Mahéo, *in litt.*).

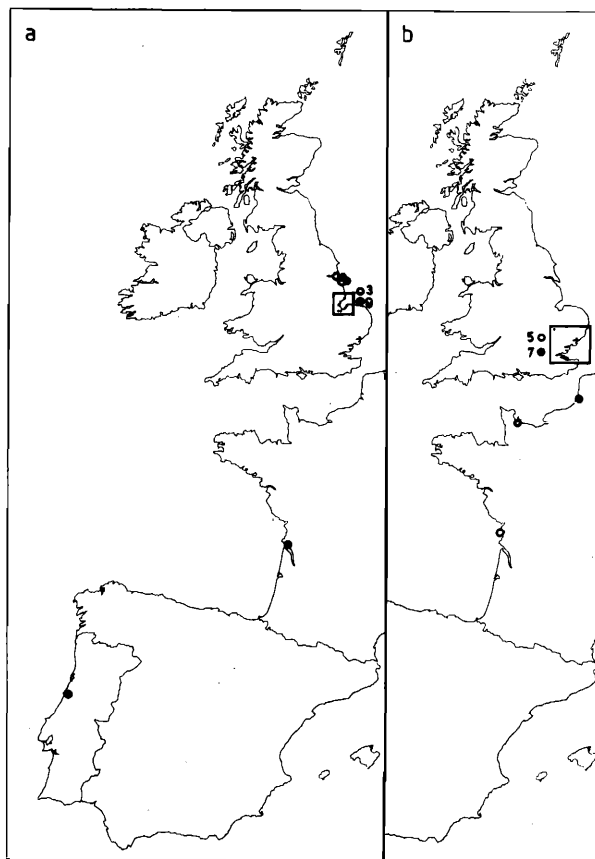


Figure 4. Reported recoveries in the same September-October period of Dunlins ringed in September-October at a) The Wash, and b) SE England. Other details as for Fig. 2.

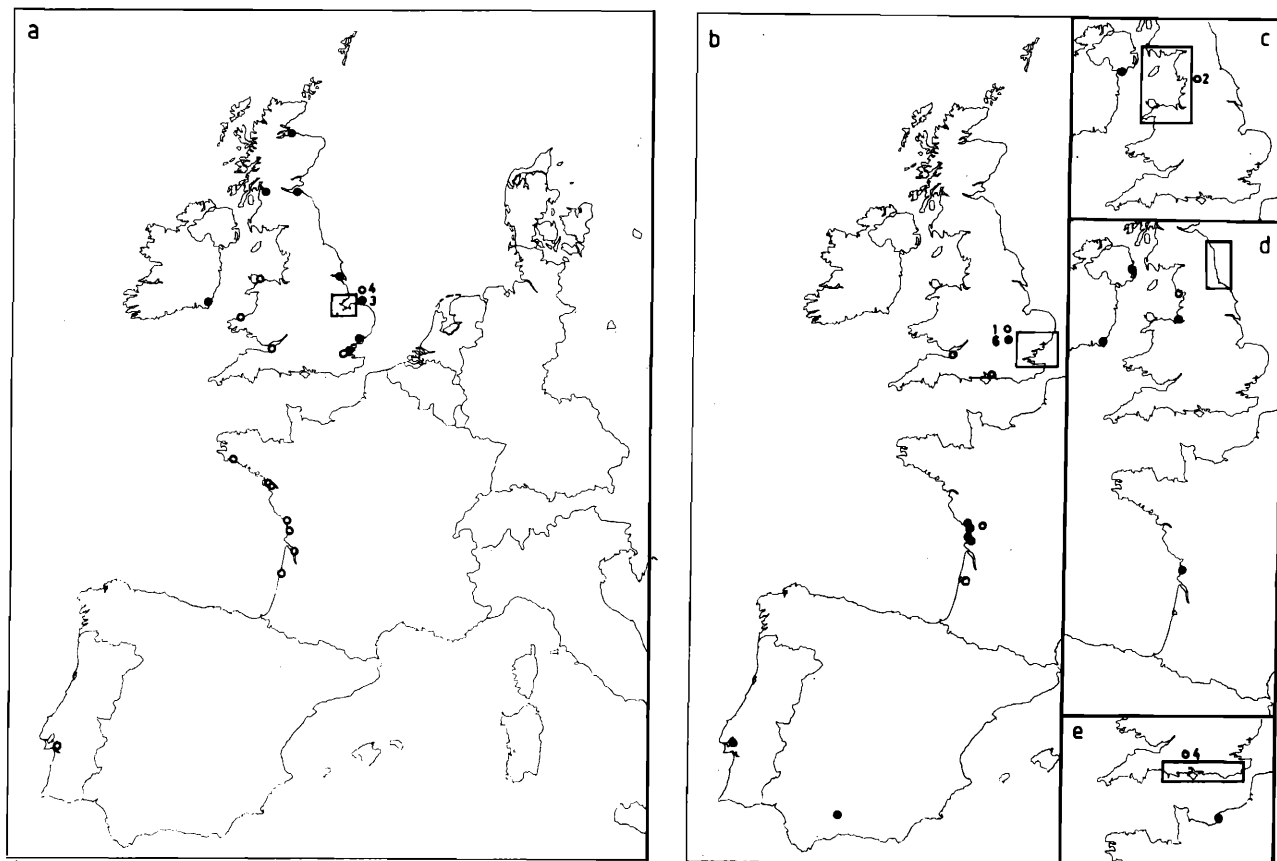


Figure 5. Reported recoveries in the following November-February of Dunlins ringed in September-October at a) The Wash, b) SE England, c) E Irish Sea, d) NE England, and e) S coast of England. Other details as for Fig. 2. Not shown is one bird in its first-year which moved from the S coast of England to Morocco, one bird which moved from SE England to Morocco and one post-juvenile which moved from NE England to Western Sahara.

c) Ringed and recovered within September-October. Even though local recaptures are under-recorded, most recoveries of adult birds ringed at the Wash or in SE England at this period (of annual moult) were close to the ringing area (Figs. 4a,b). Some dispersal of the juveniles is, however, indicated, as well as the migration of three adults, to France and Portugal.

d) Ringed in September-October and recovered November-February. A wide dispersal from several areas used in autumn to sites used in mid-winter is revealed (eg Figs 5a,b,d). This is in broad agreement with the dye-marking results presented in previous reports. The essential differences between the results of the dye-marking programme and those of ringing are that the former has provided larger samples but for fewer areas of marking and has provided more precise information on timings of movements; ringing results refer, of course, to individual birds but take much longer to accumulate.

The recoveries of Dunlins ringed at The Wash (Fig. 5a) appear to show an age difference, with a few adults moving north and west whilst many juveniles moved south and west. This may, however, be an artifact, as previous results of dye-marking indicate a wide arc of movement from The Wash by both age categories. Further, the considerable movement from The Wash to south and south-west England, detected by dye-marking and detailed in previous reports, is not apparent in the ringing results. This is presumably because of the low chance of recovery in winter in these areas, since relatively few attempts are made to catch birds then, and most recoveries of ringed birds in Britain have come from recaptures by ringers.

In contrast to the extensive movements from three areas on the E. coast of England (Fig. 5a,b,d), less onward movement is evident (Fig. 5c) from birds ringed on the E. Irish Sea coast (although the chance of recovery in Ireland is probably fairly low) or those ringed on the S coast of England (Fig. 5e).

e) Ringed in July-August and recovered in November-February. As might be expected, the recoveries in this category of birds ringed at the Wash (Fig. 6) tend to overlap with those reported in sections (b) and (d) above, except that there are no NW African recoveries. This may be because, by mid-winter, most of the NW African wintering birds have moved on from moulting and staging areas in Morocco, where the chance of reporting of ringed birds is reasonable, to the main mid-winter concentrations on the sparsely-inhabited Banc d'Arguin of Mauritania (Pienkowski & Dick 1975).

It is not known if the relatively high number of recoveries in Iberia reflects a tendency for those birds staging earlier (July-August) at the Wash to winter here, whereas those staging later (September-October, Fig. 3a) winter further north in W. Europe. Alternatively, it could be an artifact of seasonal variations in hunting pressure.

f) Ringed and recovered within November-February. This appears to be a fairly static period of the year for Dunlins. Apart from juveniles moving to S Spain and NW England, recoveries of Wash-ringed birds were local (Fig. 7a). Similarly, recoveries of Dunlins ringed in SE England were all local except for one in SW France and one in NW Spain (Fig. 7b). (Unfortunately, ages at ringing of neither bird were established.) All recoveries from the E. Irish Sea estuaries were within the general ringing area (Fig. 7c).

g) Ringed in November-February and recovered in March-June. Spring recoveries are few (Fig. 8), probably because catching activities are fewer or less successful in that season and because the shooting season has finished by then in several of the countries in which this species is hunted. Of Dunlin ringed at The Wash, all recoveries were local, as

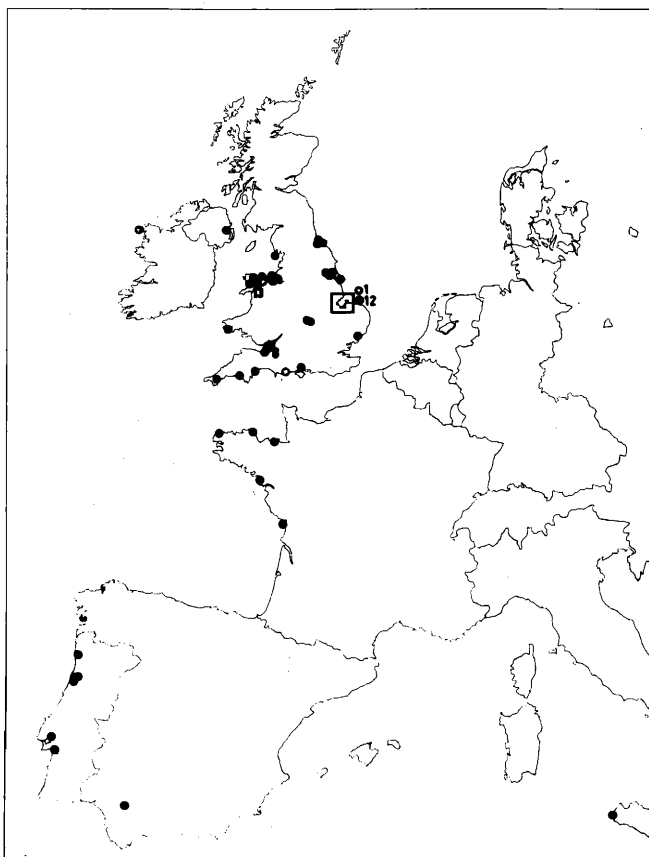


Figure 6. Reported recoveries in the following November-February of Dunlins ringed in July-August at the Wash. Other details as for Fig. 2.

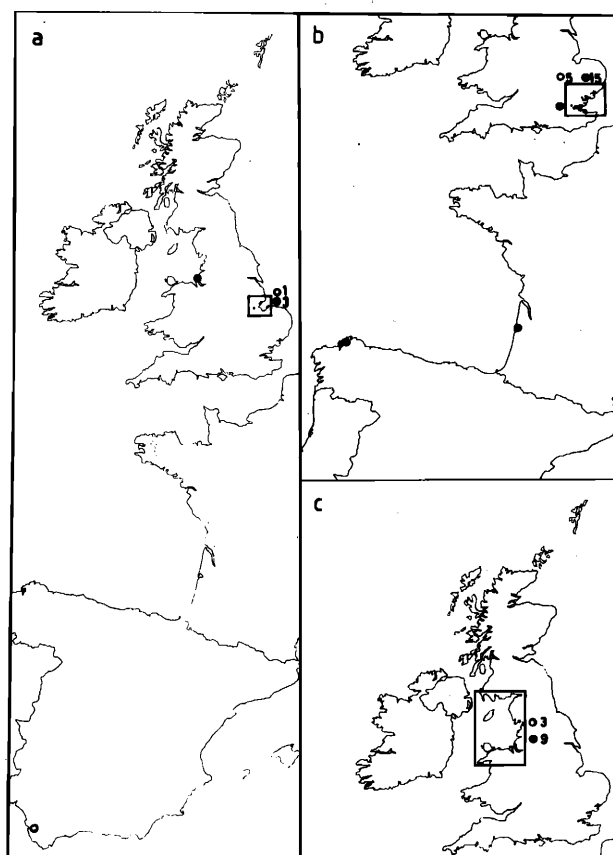


Figure 7. Reported recoveries in the same November-February period of Dunlins ringed in November-February at a) The Wash, b) SE England, and c) E Irish Sea. Other details as for Fig. 2.

Figure 8. Reported recoveries in the following March-June of Dunlins ringed in November-February at a) SE England, b) the Severn Estuary and Bristol Channel, and c) E Irish Sea. Other details as for Fig. 2. Not shown are recoveries in Finland of one bird each (both in their first year of life) from SE England and E Irish Sea, and one bird from SE England in the Soviet Union

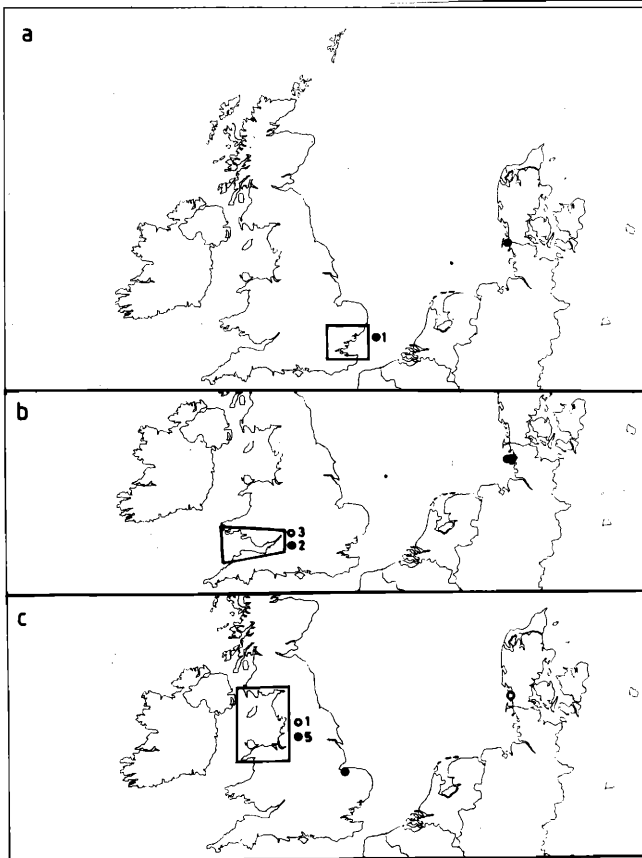
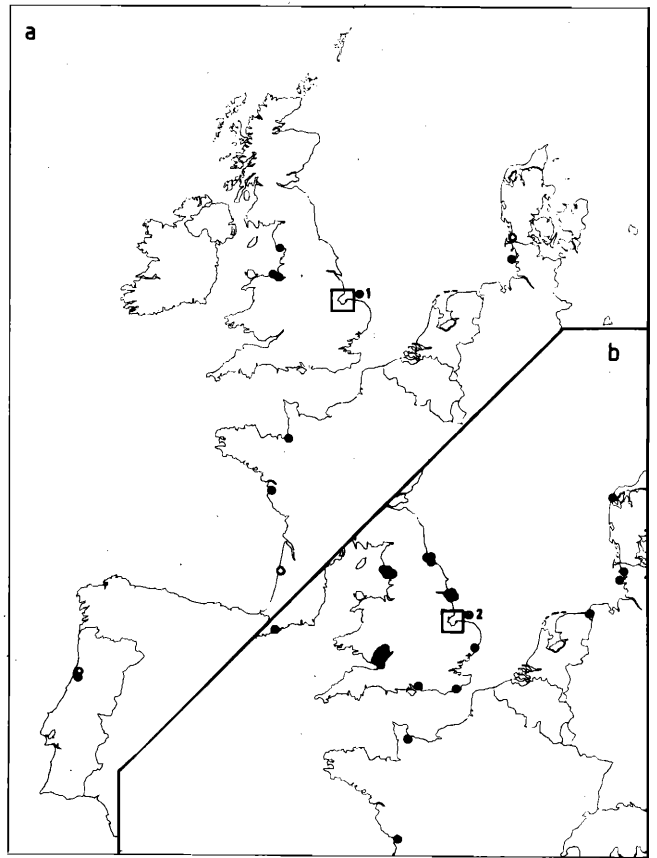


Figure 9. Reported recoveries in the following March-June of Dunlins ringed at The Wash in a) September-October, and b) July-August. Other details as for Fig. 2. Not shown in b) are two birds in the Soviet Union and one in Morocco (all post-juveniles).



were recoveries of Dunlins ringed in SE England (Fig. 8a) and the Severn (Fig. 8b), except for one and two birds, respectively, recovered in the German Wattenmeer. Most Irish-Sea-ringed Dunlins were recovered locally with one recovery in each of The Wash and the Danish Vadehavet (Fig. 8c). These recoveries parallel the rather more numerous results from dye-marking, summarized by Pienkowski & Evans (in press) and reproduced as Fig. 11.

h) Ringed in autumn and recovered in March-June. Maps of recoveries of birds ringed at The Wash in September-October or July-August and recovered in the following March-June are given in Figs 9a,b. These are slightly more difficult to interpret as they may include both birds still on their wintering grounds and those that had moved to sites used in spring. Therefore, both maps in part reflect the winter distribution of birds ringed at The Wash in autumn (Figs 5a, 6). However, considerable usage of the German and Danish coasts in spring by the autumn-ringed birds (Figs 9a,b) contrasts with the lack of evidence of such usage by winter-ringed birds at the Wash (for which all spring recoveries were local). This may indicate that those Dunlins which winter at the Wash tend to remain there through much of the early spring, whilst those leaving to winter further south or west are more likely to use the Wadden Sea in the spring. The fact that some birds which were at the Wash as early as July or August used the Wadden Sea in spring may suggest that these individuals use different sites for their autumn and spring staging areas.

## B. Results from visible marking

As noted earlier, results from the visible marking in previous years, as well as the early part of 1982-83, have been summarised in previous progress reports. Movements of Dunlins following the marking at Baie du Mont St. Michel, France, in November 1982 are shown in Fig. 10. Considerable numbers of marked birds remained near the marking area but others dispersed widely along the French coast. In order to aid a first synthesis of the networks of sites used by a single species (see below), a map compiled earlier from several studies (Pienkowski & Evans, in press) concerning late winter to spring movements of Dunlins is reproduced as Fig. 11.

## C. Synthesis for a first assessment of the movements network of Dunlin

### 1. Introduction

Using the information on within-year recoveries summarized in this report and on the results of the dye-marking programme for which example results are given in this and previous reports, a first attempt is made here to identify the networks of sites used by individual Dunlins within the non-breeding season in western Europe. Additional information on the longer-distance movements to and from the breeding grounds of the various populations is taken from earlier publications (eg Pienkowski & Dick 1975, Hardy & Minton 1980, Pienkowski 1983, and previous sources referred to in these papers).

Figure 10. Sightings elsewhere of birds marked at Baie du Mont St Michel, France. Lines join location of marking to that of sighting. Numerals indicate month of marking → month of sighting.

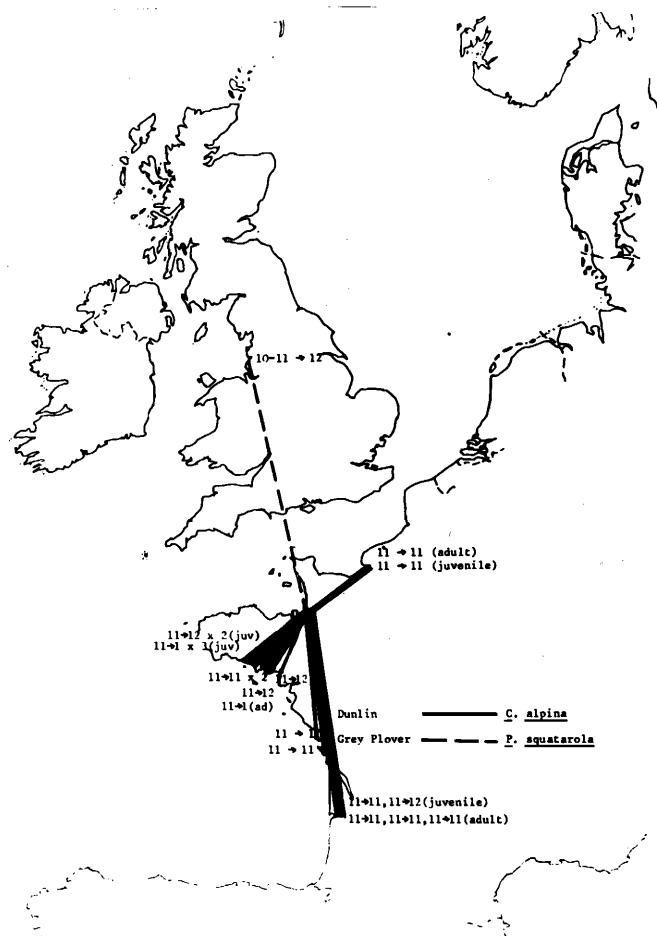
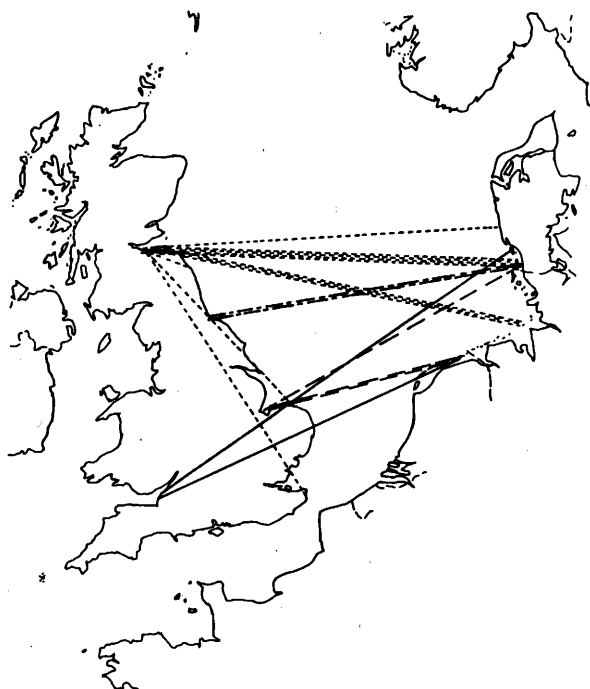


Figure 11. Some of the sightings away from the marking area in the following March and early April of Dunlins marked in winter (1978/9 to 1981/2) at the Severn Estuary (—), The Wash (— —), the Tees Estuary (— · — ·), or the Firth of Forth (-----). Lines join the location of each sighting to the marking area and do not necessarily indicate routes taken (from Pienkowski & Evans, in press).



For this synthesis, the various estuaries and other coasts of western Europe are grouped into regions. Where possible, these regions are natural groupings suggested by the results (eg E Irish Sea; S coast of England and part of the N coast of France). However, in other cases, the grouping is more arbitrary and forced by the limited quantity of data presently available (eg Ireland, W France). In some cases, finer resolution may be possible when the latest available set of ringing recoveries are received from Euring; this may help subdivision of, eg, the large Wadden Sea areas. At present, only British (and the few Irish) ringing recoveries are included in the compilation.

## 2. Autumn and spring migration of populations wintering in Africa

Those populations of Dunlins which breed in temperate areas of Europe and in Iceland and Greenland winter mainly in West Africa. Very many coastal areas of western Europe are visited by these birds on their autumn migration (see, eg, Pienkowski & Dick 1975, Green 1978, Pienkowski 1983) and it is not possible at present to establish how many sites an individual uses, nor if particular sites are of especial importance. In spring, there is information that migration of the most numerous component of these populations, that from Iceland, is concentrated on the western seaboard: probably Iberia, W France, W Britain, possibly Ireland, and E Britain from Teesmouth northwards. Further information on this migration network should be revealed by studies planned for spring 1984 (see below).

## 3. Movements of *C. a. alpina*

The remainder of this analysis concerns the more numerous subspecies of Dunlin, which breeds in N. Eurasia and winters in W Europe.

### a) Movements from sites used in autumn to sites used in winter.

Large numbers of Dunlins move between sites in western Europe, chiefly in October–November; this coincides with the end of moult of the adult birds. Movements for which there is clear evidence are indicated in Figure 12. Additionally, many birds remain at their autumn (moulting) sites: later analyses will try to quantify the relative proportions that stay and that move from certain sites.

Despite the complexity of Figure 12, some distinct patterns are shown. Some areas have a net loss of Dunlins at this time; numbers of birds leaving exceeding numbers of birds arriving. The Wadden Sea is the prime example, particularly the more north-easterly parts of that area. Dunlins from the Wadden Sea move as far west as the Irish Sea, as far north as the Moray Firth, and as far south as Iberia. There is also some movement to the Wash, but this appears to be relatively small. The Wash is also clearly a major "exporter" of Dunlins at this time. Counts support this, showing that peak numbers occur on the Wash in September (Prater 1981).

Other sites appear to be both major suppliers and recipients of Dunlins: Netherlands Delta, SE England, E Irish Sea and, to some extent, NE England. Finally, several sites on the western seaboard of Europe and in northern Scotland seem to be mainly recipients of Dunlins at this time, although they may hold small moulting flocks of Dunlins earlier in the autumn.

#### b) The mid-winter period.

The period from November to February appears to be the most static period as regards interestuarine movements of Dunlins (Fig. 13). Some movements do occur, for example from The Wash to the Irish Sea and Iberia, and from SE England to France and Iberia. Counts also suggest some continued movement at this period: peak numbers occur at several western and southern sites in January or February (Prater 1981). Marking at Baie du Mont St Michel in France in November showed numerous mid-winter movements in both directions along much of the W coast of France. Generally, however, the numbers of Dunlins moving is far less than immediately after the moult. A marking study in the Firth of Forth in the winter of 1978-79 showed no appreciable influx into that area over the late winter period (Pienkowski & Clark 1979, Symonds *et al.* in press).

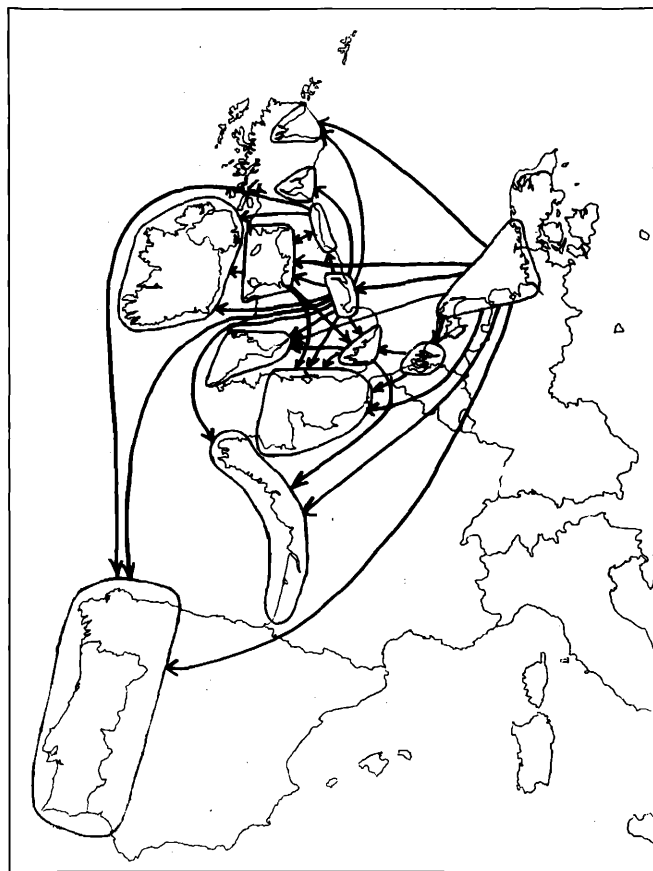


Figure 12. Summary of late autumn (post-moulting) movements of Dunlins, for which there is direct evidence. Lines do not indicate actual routes taken between areas.

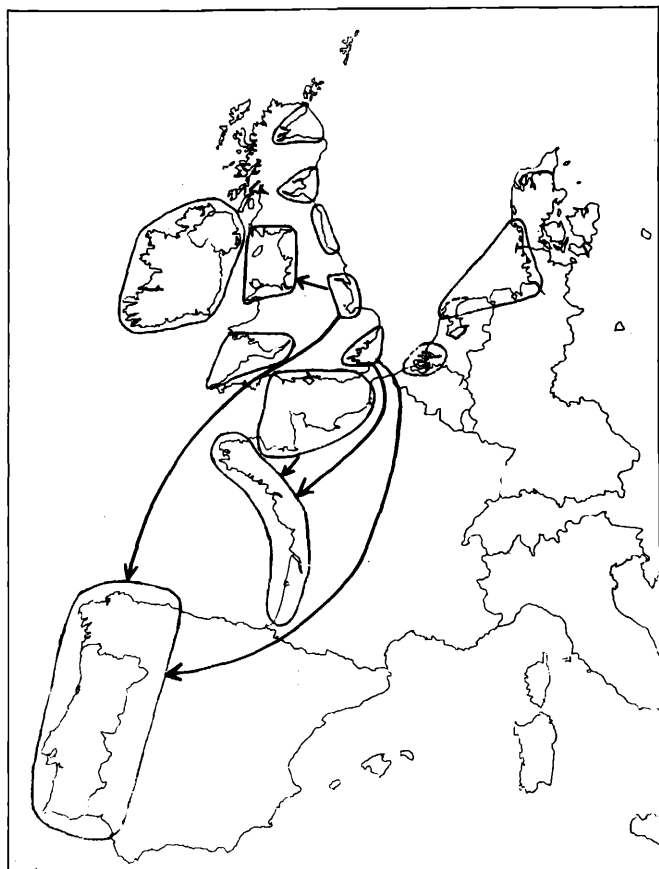


Figure 13. Summary of movements of Dunlins, within the period November to February, for which there is direct evidence.

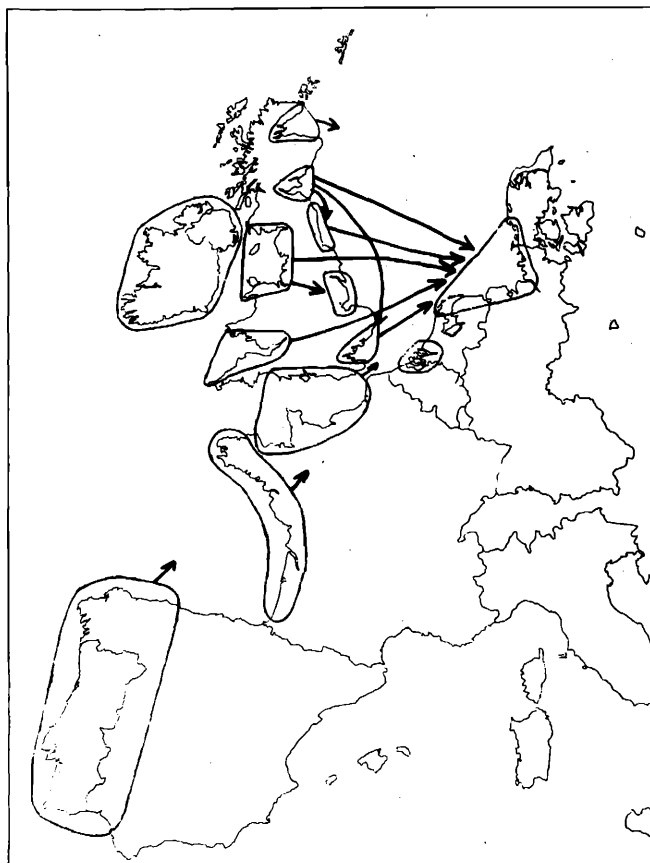


Figure 14. Summary of movements of Dunlins, in the late winter-early spring period, for which there is direct evidence.



c) Movements from sites used in mid-winter to those used in early spring.

In the period from mid-February onwards, more movements occur than in the mid-winter period. Birds move to certain areas for the moult into breeding plumage and deposition of fat to fuel their return to the breeding areas. Fig. 14 summarizes those movements for which there is direct evidence although, as noted earlier, spring information is rather limited. Movements from several areas of Britain to both the Wadden Sea and the Wash are well established. Count information reveals similarly timed departures from many other areas, but direct evidence of the destinations of these birds is lacking.

D. Further work

Further studies will refine the outline of movement patterns proposed here and quantify them (in so far as this is practicable). Contrasts between movements of adults and juveniles will be explored further. Use will also be made of recoveries in years other than that of ringing. The approach is also, of course, being applied to other species. The environmental factors which underlie these patterns of movement have been discussed by Evans (1976, 1981), Pienkowski (1981), Pienkowski & Prokosch (1982) and Pienkowski & Evans (1983), on the basis of the results of the present study and those of related detailed studies (such as that at Teesmouth) of the effects of environmental factors on the behavioural ecology of the species concerned.

WORK FOR 1983-84: RINGERS AND WATCHERS PLEASE NOTE

We are now well into the final year of funding for this project.

Information from the project has already been supplied to the Nature Conservancy Council in respect of statutory Public Enquiries into proposed industrial development on the coast of Kent, SE England, and agricultural reclamation at The Wash, E England.

However, the main analyses remain to be done and these will increasingly occupy the time of the project team during forthcoming months. Despite this, two aspects of the project directly involving WSG members continue for the present.

A. Computerization of ringing and retrap data

All the data supplied to date on green WSG data forms have been transferred to computer file and run through the checking programs. Those transcription and other errors that we have been able to handle have been corrected and print-outs sent back to the ringers for their final checking. Many of them have now returned corrections. If your group has started supplying data, we urge you to make sure that all remaining data are sent as soon as possible to ensure its transfer to the computer and inclusion.

If your present or past ringing sites are not marked on Figure 1., then we have not received any of your data. (If your site is marked, this does not, of course, mean that we necessarily have all your data.) We urge you strongly to supply it now. It is important for the project that the data-set be as complete as possible: because analysis of movements is the aim, incomplete data from one site means that the data from other sites cannot be used fully. From a wider point of view, WSG is anxious to make the computerization as complete as possible, to allow future cooperative projects. It is extremely unlikely that resources will become available again in the future to allow computerization of the back-log of data.

If at all possible, old data should be recoded on WSG green forms. We would be pleased to supply these, instructions and advice (there is no charge for the forms). However, we recognize that this task is too great for some ringing groups, particularly those which now have rather smaller membership than previously. Accordingly, we are now prepared to accept such data on old-style WSG forms, ringing schedules or similar documents. (Our new helpers, Shirley Stewart, Christine Spencer and Michele Cheeseman, are learning rapidly about coding, checking data and even deciphering the antique scribbles of some of our most senior wader ringers!) This is the last chance: do not miss it: contact Ann now by letter or at the telephone numbers given below.

B. Visible marking and the observer network

1982-83 was another successful season for this aspect of the project, adding important new information (see above and the seventh progress report). Thanks are due to all the ringers who mark the waders, the observers who faithfully report whether they have the reward of seeing any marked waders or not (and the importance of this cannot be stressed too highly), and all the bird-watchers and organizations who send reports of casual sightings.

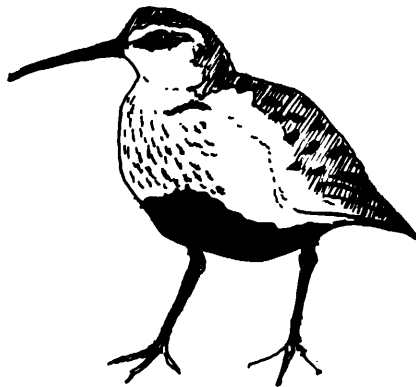
1983-84 will be the final marking season for the present project, and the project team will again be handling sightings for more local projects in several countries. We shall also be handling sightings in spring for the new WSG/Birds of Estuaries Enquiry Project on spring migration in Western Britain (more on this in the next issue of WSG Bulletin), for which some pilot work was undertaken on the Solway by Mike Moser and others in May 1983. It is also possible that marking will be undertaken to investigate the effects of further reclamation at Teesmouth, but (as usual) what actually happens in reclamation developments there will be decided at very short notice.

We have been in discussion with the various ringing teams involved and the first birds should have been marked in some areas by the time that this progress report is read. We hope that all our existing network of observers will help again this year and we would, of course, welcome any new helpers. There are no fixed checking dates but we ask observers to report all visits to their sites, whether or not marked birds are seen. We also ask for an estimate of the numbers of birds of each species checked for marks.

As ever, we ask people who see marked birds to note the colour and position of dye. Generally, dye may be either in front of or behind the legs, or over the entire underside. For some dye-colours, the in-front-of-the-legs position is further divided into (i) upper breast and neck collar, or (ii) lower breast and belly in front of the legs. If leg flags are seen, please also note the colour and position.

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## CURLEW GIZZARD LININGS

As part of a study into the feeding ecology of Curlews Numenius arquata in the Severn Estuary, we are trying to establish a relationship between the dimensions of cast gizzard linings and bill length. We would, therefore, be very grateful to receive any of the following - complete gizzards (e.g. after the contents have been removed for dietary studies) or gizzard linings from birds of known bill length; cast gizzard linings from birds of known bill length in captivity; partly decomposed bodies which include the head and gizzard. Freshly dead Curlews should still be sent to Dr. N.C. Davidson at the University of Durham, for the WSG Project on the effects of severe weather on waders. The address for the former material is - Dr. P.N. Ferns, Zoology Department, University College, Cathays Park, Cardiff, CF1 1XL, Wales (postage will be refunded on receipt).