

ISSN 0036-9144

# SCOTTISH BIRDS



THE JOURNAL OF THE  
SCOTTISH ORNITHOLOGISTS' CLUB

Vol. 13 No. 5

Spring 1985



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# SCOTTISH BIRDS

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Volume 13 No. 5

Spring 1985

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Edited by V. M. Thom, assisted by S. R. D. da Prato, R. W. Furness  
and I. R. Taylor

## Editorial

### Looking ahead to Jubilee Year

One of the most important changes planned to mark the Club's Golden Jubilee—a 'new look' for *Scottish Birds*—was formally approved by Council at the end of January. Starting in February 1986 every member will receive a quarterly *SOC News*, carrying topical reports, short notes, reviews, Club and other notices and similar non-technical material, and a twice-yearly *Scottish Birds*, containing the more scientific papers and the *SBR*. Final details have yet to be worked out by the Editorial Committee, but the hope is that with these two complementary publications we will be able to cater for the varied needs of members more adequately than has been possible within the constraints of the present format of *SB*.

We at the Editorial end are keen to ensure that *SOC News* reflects the interests and activities of a wide spectrum of the Club's membership; whether or not it succeeds in doing so will be largely up to you, the members. So put your thinking caps on, both as individuals and within the Branches, and send us your suggestions. We would also welcome short articles about current surveys, good 'birding' places, summer 1985 expeditions and 'appetite whetters' describing projects planned for 1986. And of course we will be looking for line drawings (including cartoons) and photographs, so this is an appropriate moment to remind you that entries for the 1985 Photographic Competition must be in by the end of September. As before, photographs must be of wild birds in Scotland and be taken within two years of the closing date. There is no limit to the number of entries each photographer may submit.

## The Scottish Mute Swan Census 1983

A. W. BROWN and L. M. BROWN

The first complete census of the Mute Swan in Britain for 28 years took place in 1983. This paper presents the census results for Scotland; a full analysis for the whole of Britain will be published separately (Ogilvie, in prep.). The census was carried out by the British Trust for Ornithology in co-operation with the Scottish Ornithologists' Club and the Wildfowl Trust. The last national census in 1978, also organised by the BTO (Ogilvie 1981), was based on a random sample of 10 km squares with only one or two areas in Scotland achieving full coverage (Brown and Brown 1984, Spray 1981). The need for another census was related to the increasing concern in some areas over the effects of lead poisoning on Mute Swan populations (Nature Conservancy Council 1981, Ogilvie 1983). Although there is no evidence that lead poisoning is a major problem in Scotland (C. J. Spray, pers. comm.), it was considered opportune to attempt full coverage, to allow comparison with previous surveys in 1955/6, 1961 and 1978 and to obtain a base line for future reference.

### Methods

The recording unit was the 10 km square of the National Grid, now the basic unit used by the BTO in census work. Local organisers, usually the BTO Regional Representative or SOC recorder, were provided with a list of 10 km squares for which they were responsible, instruction sheets and recording forms, and a list of sites in their area which held breeding pairs of Mute Swans and/or non-breeding flocks in 1955/56 (Rawcliffe 1958), the sites found in the 1978 random sample, and sites recorded in the 1961 sample census (Eltringham 1963) where relevant.

As in 1978, the census period was 1 April to 31 May and the recording forms required two sets of information. One form related to breeding pairs and requested observers to note all territorial and breeding pairs located within their allocated 10 km square, together with a brief description of habitat. Observers were asked to restrict their observations to the survey period if possible, with additional visits to sites to determine if territorial pairs actually bred, i.e. a nest or young were seen. The difficulty of obtaining coverage in some parts of Scotland resulted in acceptance of breeding records outside the census period but late records of territorial pairs from July onwards have been discounted. The second form requested information on non-breeding flocks, the aim being to achieve full coverage between 1st and 30th April, when the non-breeding flocks are fairly stable. It was hoped that counts could take place on or around the 16th/17th; counts nearest that date have been used while observations in early March and after 15th May have been discounted. To enable easier comparison with previous surveys, observers were asked to note the grid reference of the observation and the new region or district and old county in which the relevant 10 km square was located.

In addition to the official observer network the census was advertised



in the press and the public, especially school children, were encouraged through a television programme to support the survey by adopting and reporting on their local swans or any they might see when on holiday in the remoter parts of Scotland. The latter produced an encouraging response although only a few additional breeding sites were recorded. Most of the survey data were returned by the end of the year and indicated that in general coverage was fairly thorough, though parts of the north and west were probably under-recorded.

## Results

The numbers of breeding birds, territorial only birds and non-breeding flocks and the population totals for each of the former Scottish counties, are presented in Table 1, together with the corresponding figures for 1955/56.

**Breeding and territorial birds** Breeding birds represented 38.3% of the total population, while 11.2% were territorial only (Table 1). For 1983 territorial birds are shown separately, rather than being included in the non-breeding total as presented for the 1955-56 census (Rawcliffe 1958); this has been done to give some indication of the number of potential breeding pairs and sites in each county. When territorial only birds are added to the breeding population of 565 pairs (2 single nesting birds have been regarded as 2 separate pairs), this gives a potential breeding population of 729 pairs. The cold, wet spring of 1983 had a definite impact on breeding numbers and success, especially on the rivers where many nests were washed out or nesting prevented altogether (Brown and Brown, in press, Murray 1984, Spray 1984). If the only reports of breeding pairs were territorial records in May then earlier breeding attempts may have gone unnoticed. The census was not designed to determine breeding success therefore the outcome of nesting on rivers as opposed to inland waters cannot be determined.

Table 2 shows the distribution of breeding and territorial birds according to habitat. The small percentage (10.4%) nesting on rivers in 1983 is probably related to the high water levels in the spring. Ogilvie (1981) has shown that in Britain as a whole this habitat held 34.2% and 34.3% of the breeding population in 1961 and 1978 respectively. At a regional level variations are evident according to available habitats. Sea loch, coastal or brackish sites predominate in parts of the north and west, e.g. 54.5% of breeding sites in the Outer Hebrides and Argyll (Newton 1983, unpub. rep.), 48.9% in Orkney, 77.8% in Sutherland and 84.6% in Ross and Cromarty, whereas in the east and south freshwater lochs and ponds are of greater importance e.g. 66.1% of breeding sites in Aberdeen/Banff, 57.7% in Lothians, 45% in Angus, 89.4% in Perth, 57.6% in the Borders and 80.5% in the south west. The use of rivers for breeding is concentrated in central, east and south Scotland with 29.1% of breeding pairs in Aberdeen/Banff on this habitat, 26.9% in Lothians and 39.4% in the Borders. In general however, rivers appear to be less well used as a breeding habitat in Scotland compared with England. Brown and Brown (1984) have shown a reduction of 73.1% in the number of pairs breeding on rivers in the Lothians from 1961 to 1982 with increasing public access possibly a major factor in the decline. Unfortunately there are no comparable data for elsewhere in Scotland although Murray (1984) considers that there has been no significant change on the Borders rivers.

**Non-territorial birds** Non-territorial birds comprised 50.5% of the total population (Table 1); the addition of territorial only birds to this figure indicates that 61.7% of the Mute Swan population did not breed. As counts of non-breeding birds have not been accepted beyond 15th May

**Table 1** Numbers of breeding, territorial and non-breeding Mute Swans and population totals for each Scottish county in 1983 and breeding and non-breeding totals in 1955/56

County	1983			1955/56			
	Breeding birds	Territorial only birds	Non-breeders	Total birds	Breeding birds	Non-breeders <sup>4</sup>	Total birds
Shetland	0	0	0	0	0	1	1
Orkney	135 <sup>1</sup>	18	170	323	52	101	153
Outer Hebrides <sup>2</sup>	224	40	428	692	44	330	374
Caithness	14	6	0	20	2	0	2
Sutherland	18	4	3	25	12	34	46
Ross & Cromarty	26	10	60	96	42	67	109
Inverness	24	10	33	67	4	0	4
Nairn	0	2	0	2	6	0	6
Moray	20	2	0	22	46	16	62
Aberdeen <sup>3</sup>	118	62	144	324	72	112	184
Banff <sup>3</sup>	6	2	4	12	10	7	17
Kincardine	8	2	2	12	8	8	16
Angus	40	2	136	178	22	152	174
Perth	38	12	56	106	28	30	58
Stirling	14	4	16	34	20	42	62
Clackmannan	4	0	4	8	0	0	0
Kinross	2	4	10	16	16	249	265
Fife	20	12	29	61	46	7	53
West Lothian	6	0	3	9	14	12	26
Mid Lothian	16	0	8	24	38	99	137
East Lothian	30	4	73	107	18	34	52
Ayr	28	16	38	82	64	149	213
Arran & Bute	8	2	0	10	4	14	18
Peebles	8	6	2	16	4	0	4
Selkirk	12	0	9	21	22	3	25
Roxburgh	20	10	24	54	34	27	61
Berwick	26	10	13	49	16	10	26
Argyll	88	36	18	142	48	180	228
Dunbarton	10	2	1	13	20	34	54
Renfrew	28	4	3	35	66	14	80
Lanark	24	10	34	68	44	200	244
Dumfries	42	6	25	73	72	130	202
Kirkcudbright	49 <sup>1</sup>	24	124	197	24	48	72
Wigtown	22	6	18	46	8	18	26
	1128	328	1488	2944	926	2128	3054

### Explanatory notes to Table 1

- 1 Only single birds seen at one nest.
- 2 Counts in the Outer Hebrides were principally done from the air, with supplementary ground observations.
- 3 Counts in Aberdeen/Banff were supplemented by air surveys.
- 4 Territorial only birds included.

it is likely that the non-breeding counts are an underestimate of the actual total, with some sites overlooked especially in the north. Table 2 shows the distribution of non-breeding birds (excluding territorial only) according to habitat. These figures clearly demonstrate the importance of coastal or brackish waters for non-breeding birds. The availability of suitable habitats appears to determine the location of non-breeding flocks and the principal requirements are probably adequate feeding and safety. The proportion of non-breeding birds found on brackish/sea loch habitats was 86.5% in Orkney, 84.8% in Inverness, 100% in Ross and Cromarty, 99.3% in Angus, 69.2% in Fife/Kinross, 67.8% in Lothians and 100% in Ayrshire. Elsewhere freshwater lochs and ponds accounted for 51.4% in Aberdeen/Banff, 64.3% in Perth, 66.7% in Argyll, 97.1% in Lanarkshire and 62.9% in Kirkcudbright. Rivers were of importance in Perth (35.7%), Stirling/Clackmannan (80%), the Borders (77.1%) and Dumfries/Kirkcudbright (41.6%). All flocks of 30 birds and over are shown in Table 3, which suggests that in April about one-third of the non-breeding birds in Scotland are found in only 6 flocks (excluding Outer Hebrides birds for which flock details were not available.)

**Table 2** Distribution of Mute Swans in Scotland in 1983 according to habitat type

Habitat	Breeding birds	%	Territorial only birds	%	Non-breeding birds <sup>1</sup>	%
Freshwater lochs, ponds	654	58.0	160	48.8	323	30.5
Reservoirs, flooded pits	42	3.7	14	4.2	10	0.9
Rivers, streams	118	10.4	80	24.4	150	14.2
Canals, ditches	12	1.1	0	0.0	0	0.0
Sea lochs, coastal, brackish	302	26.8	74	22.6	577	54.4
<b>TOTAL</b>	<b>1128</b>		<b>328</b>		<b>1060</b>	

<sup>1</sup> Outer Hebrides birds (428) are excluded, data not available.

### Discussion

The 1983 Mute Swan census has shown that the total Scottish population has fallen by 3.6% since the last full census in 1955/56. This compares with an estimated decrease of 15% up to 1978 for the whole of Britain (Ogilvie 1981). The 1961 and 1978 figures have not been used here for comparison as they relate to sample censuses only. Even comparisons with the 1955/56 census must be treated with caution in view of the differences in coverage achieved in the two surveys.

Rawcliffe (1958) stated that the success of the 1955/56 survey was moderate, with some counties only partially covered, and Ogilvie (1981) has indicated county totals which he considered too low in 1955/56. With greatly improved coverage in most areas in 1983 (see Appendix for assessment of coverage) it is likely that the population figure, 2944 birds, is more realistic although it may still be an undercount. Comparison with 1955/56 is also complicated by the nature of the data collected with regard to non-breeding birds. Many of Rawcliffe's non-breeding counts refer to June, July or even later, at which time birds are very mobile and moving to moult sites and consequently may have been double-counted. Thus the totals he presented were probably an overcount. The non-breeding flocks shown in Table 3 are not comparable with those recorded in the previous census, which generally referred to gatherings at such sites as Loch of Strathbeg, Montrose Basin and Loch Leven, which are now known to hold moult flocks.

**Table 3** Flocks of more than 30 non-breeding Mute Swans recorded in April 1983<sup>1</sup>

Location	Habitat	Number	Date <sup>2</sup>
Montrose Basin, Angus	Estuary	115	28 April
Loch of Stenness, Orkney	Brackish loch	83 <sup>3</sup>	22 April
Tyne Estuary/Belhaven, E. Lothian	Estuary	52	17 April
Ythan Estuary, Aberdeen	Estuary	49	17 April
Loch Milton, Kirkcudbright	Freshwater loch	45	21 April
Loch of Strathbeg, Aberdeen	Freshwater loch	44	12 April

<sup>1</sup> Outer Hebrides flocks not included: data not available.

<sup>2</sup> Counts nearest the recommended date of 16/17 April were taken where more than one count was submitted for a site.

<sup>3</sup> This total represents a cumulative flock total for the site on 22 April, the largest individual group being 64 birds.

Despite these difficulties, it is possible to identify apparent changes in the numbers and distribution of Mute Swans between counties and within the country as a whole. The 1983 census results support the view expressed by Ogilvie (1981) that the population in the north of Scotland may still be expanding its range in some areas. In Orkney there has been a 111.1% increase in the total population since 1955/56 and in north east Scotland (Aberdeen, Banff and Kincardine) an increase of 60.4%. Even allowing for improved coverage these figures must represent real increases. Those counties probably less well covered in both censuses (Caithness, Sutherland, Ross and Cromarty, Nairn, Moray and possibly Inverness) generally show a stable population, though distribution between them

may have altered especially with regard to non-breeding birds. In contrast there appear to have been major declines in central Scotland, confirming the findings from the adjusted totals for 1978 (Ogilvie 1981). Since 1955 the population has declined in Argyll by 37.7%, Ayr by 61.5%, Lanark by 72.1% and Kinross by 94%; indeed the decline for the latter county since 1961 is 95.4%. Much of this decline appears to relate to a decrease in the non-breeding flocks, though many of the counts for 1955/56 and 1961 are not directly comparable e.g. the counts for those years at Loch Leven, Kinross, were made in July and June respectively. Nevertheless, it does seem that there has been a decline in these areas. In the south west the population has remained fairly stable but redistribution, of non-breeding birds in particular, has occurred from Dumfries to Kirkcudbright. The Borders population appears to have increased but it seems likely that the 1955/56 coverage was incomplete and that the population may in fact have declined (Murray, 1984).

The only detailed studies of Mute Swans in Scotland have taken place in the Outer Hebrides and the Lothians where full censuses were initiated in 1978; the results of these studies indicate how populations can change. Between 1955/56 and 1978 Mute Swans in the Outer Hebrides apparently increased by 185%; the first count probably under-recorded the population but the 1978 census was a complete one. Since 1978 this population has declined by 29.2%, the decline mainly relating to a reduction in the non-breeding population, with the loss of over 300 birds between 1978 and 1983. This population is considered to be an isolated and closed community (Spray 1981) and population changes presumably relate to variation in breeding success and the effects of hard winters. The Lothians population is thought to have been fairly stable between 1955 and 1961 but has since declined by about 55% (Brown and Brown 1984). The reduction in the non-breeding population there has been attributed to the current unsuitability of a former non-breeding flock site, but a reduction of about 50% in the breeding population has proved more difficult to explain. Similar studies elsewhere in Scotland would be helpful in assessing the significance of and reasons behind local changes and their relationship to the national trend. The East Scotland Mute Swan Study which commenced in 1982 may be valuable in this respect (Spray 1983).

In conclusion, therefore, and allowing for variation of coverage between 1955/56 and 1983, it is suggested that the Mute Swan population of Scotland has either remained stable with some redistribution or has declined slightly. Rawcliffe (1958) suggested that the total of 3054 birds recorded by

the 1955/56 census could be increased to 3500-4000 birds to allow for the poor coverage of some counties, and the 1978 estimate of 3680 birds (Ogilvie 1981) fits closely with this assessment. As the coverage in 1983 was generally considered to be good, with the timing of some flock counts the main problem, it is believed that no more than 60 breeding birds and 250 non-breeding birds were overlooked, mainly in some of the northern counties. This would give a total population of about 3250 birds, indicating a possible 10% reduction on Rawcliffe's 1955/56 estimate.

### **Acknowledgments**

We wish to record our thanks to all observers who submitted census forms and helped to make the census a success. In particular we thank the following local organisers: Dr E. S. Alexander, N. K. Atkinson, R. A. Broad, E. D. Cameron, D. Carstairs, P. M. Collett, Dr E. Fellowes, I. P. Gibson, C. G. Headlam, R. H. Hogg, J. E. Howie, D. Macdonald, Dr B. Marshall, W. Mattingley, S. F. Newton, Dr I. D. Pennie, P. Reynolds, Dr R. Richter, H. Robb, R. J. Robertson, G. Sheppard and Dr C. J. Spray. We are especially indebted to those who summarised or provided a report on their local census results. Coverage of the Outer Hebrides was principally by means of airflights on 8 April and 2 May 1983 which were grant aided by the British Ornithologists' Union; on behalf of the observers concerned (Dr C. J. Spray and W. Neill) we offer grateful thanks for this support. Similarly, the Nuffield Foundation supported airflights over Aberdeen/Banff on 27 April and 5 May 1983 undertaken by Dr C. J. Spray as part of the East of Scotland Mute Swan Study to supplement ground census work; this grant aid too is also gratefully acknowledged. Coverage of the census was advertised in the press but we are especially grateful to Scottish Television for publicising the survey on their 'Action Line' programme on 6th April 1983. This resulted in 59 forms being returned from about 50 observers, mainly school children, and this supplemented data gathered from the official recording network; we thank these observers for their interest and support. We also thank the British Trust for Ornithology for the organisational costs involved in the census. Finally, we are grateful to the national organiser Dr M. A. Ogilvie for helpful comments in the preparation of this paper and Mrs D. Welander for typing the manuscript.

### **Summary**

The first full census of the Mute Swan in Scotland since 1955/56 took place in 1983 and showed a decline of 3.6% in the total population from 3054 to 2944 birds. 1128 breeding birds, 328 territorial only birds and 1488 non-breeding birds were recorded, representing respectively 38.3% 11.2% and 50.5% of the population. While 58.0% of breeding birds were found on freshwater lochs and ponds and 26.8% on sea lochs, coastal and brackish waters, the reverse was the case with non-breeding birds (excluding territorial only birds) in which only 30.5% were found on freshwater habitats as opposed to 54.4% on brackish sites. These percentages vary at a regional level according to the availability of suitable habitats. In April only 6 sites held flocks of over 30 birds. Taking into account variations in coverage between the two census years 1955/56 and 1983, and inadequacies in the timing of data submitted, especially for non-breeding birds, it is suggested that an upwards adjustment can be made in the total population by 60 breeding birds and

250 non-breeding birds. This brings the estimated population to about 3250 birds, representing a possible 10% decline on the estimate of 3500-4000 birds in 1955-56. In the absence of detailed local studies the reasons for population fluctuations are difficult to assess.

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## Appendix

**Assessment of coverage in each county** Comments by local organisers have been noted where given but in general coverage has been assessed on the criteria of good, moderate or poor, with additional comments where appropriate.

**Shetland** Area coverage was not attempted as the local organiser commented that "the Mute Swan remains a scarce and irregular visitor to Shetland... the last attempted breeding occurred about 40 years ago". "Attempts at introduction in earlier years" had "all met with failure". No breeding or non-breeding data were submitted for 1983.

**Orkney** Good. Full coverage was obtained and the local organiser suggested "little change" since 1978 in the breeding population.

**Outer Hebrides** Good. Excellent coverage reported by the local organiser, with the census primarily covered by air survey. A detailed breakdown of the non-breeding birds was not supplied.

**Caithness** Poor. Local organiser commented on difficulty of obtaining coverage. Non-breeding birds possibly overlooked.

**Sutherland** Moderate. Local organiser for Sutherland (west) commented that no records were submitted and that "from published records it seems never to have been recorded". Sutherland (east) organiser considered that "nearly all the areas of Sutherland" which hold Mute Swans were covered. Submitted counts for non-breeding birds were for July and August and these have been discounted; the organiser, however, was "fairly certain" that the sites concerned do not hold flocks in April.

**Ross and Cromarty** Poor.

**Inverness** Good. Local organiser considered that only "the odd pair on the west coast of the mainland" may have been missed.

**Nairn** Moderate.

**Moray** Moderate. Submitted non-breeding flock counts were outside census period and have not been accepted.

**Aberdeen** Good. Local organiser considered coverage was excellent and the ground survey was supplemented by aerial census.

**Banff** Good. Local organiser considered coverage was excellent and the ground survey was supplemented by aerial census.

**Kincardine** Good. Ground survey supplemented by aerial census.

**Angus** Good. Full coverage obtained.

**Perth** Moderate.

**Stirling** Moderate.

**Clackmannan** Moderate.

**Kinross** Moderate.

**Fife** Moderate.

**West, Mid- and East Lothian** Good. Full coverage as part of a census commenced in 1978.

**Ayr** Good. Local organiser considered that most breeding pairs were found.

**Arran and Bute** Good. Local organiser considered that most breeding pairs were found.

**Peebles, Selkirk, Roxburgh and Berwick** Moderate. Difficult to separate Scottish and English birds along the River Tweed.

**Argyll** Moderate. Local organiser considered coverage was "reasonable" with "all the important areas covered with the exception of Kintyre/Campbeltown".

**Dunbarton** Moderate.

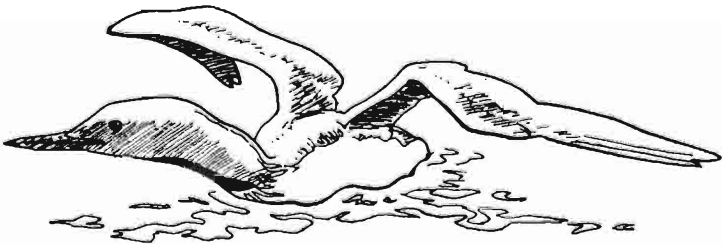
**Renfrew** Moderate.

**Lanark** Moderate.

**Dumfries** Good. Local organiser considered that "the county has been quite carefully covered".

**Kirkcudbright** Good.

**Wigtown** Moderate. Local organiser commented that observations were "rather late in the spring".



RED-THROATED DIVER *John Busby*



## Divers in the Moray Firth, Scotland

J. BARRETT and CATRINA F. BARRETT

*The Moray Firth is not only of major importance for wintering seabirds. It also holds important concentrations of divers, especially Red-throats in early winter.*

### Introduction

Large numbers of divers are thought to winter in coastal waters around Britain and Ireland, though estimates of total numbers are difficult to obtain due to their habit of feeding offshore (Prater, 1981). Red-throated Divers *Gavia stellata* predominate, particularly during autumn migration (eg. 776 off the Aberdeenshire coast on 16 September, SBR 1978) and many winter further south to the English Channel (eg. 700 off the Kent coast on 24 January, Kent Bird Report 1980). There are large concentrations of Great Northern Divers *Gavia immer* in the Outer Hebrides (Hammond 1975), and—as shown by casualties from the 'Esso Bernicia' oil spill—in Yell Sound, Shetland (Heubeck and Richardson 1980), while Lea (1980) considered that up to 500 might winter around the Orkney coast. Only small numbers of Black-throated Divers *Gavia arctica* were thought to winter, though casualties from the 'Amoco Cadiz' wreck in March 1978, many of which were in wing moult, (Hope Jones *et al.* 1978) may indicate that larger numbers winter. The importance of the Moray Firth for seabird is well documented (Mudge and Allen, 1980) and large numbers of divers were thought to frequent this area.

### Methods

During the winters of 1981-82 and 1982-83 detailed observations of divers were made during routine monitoring of seabird in the Moray Firth (as part of a bird-related environmental research programme, commissioned by Britoil). Aerial and ship-based surveys augmented observations from the shore. Where possible all divers were identified to species (83.3% of all records) and in 1982-83 the body plumage characteristics (based on descriptions in Cramp and Simmons 1977) of each individual were noted ie. whether the birds were in summer, winter or transition plumage. Monthly counts of the whole area (Fig. 1), from Kintradwell in the north to Spey Bay in the south, but excluding the inner firths, were undertaken, usually over a period of 4 to 5 days, to ascertain overall numbers. Regular observations of the main sites were made to determine fluctuations and peak numbers.

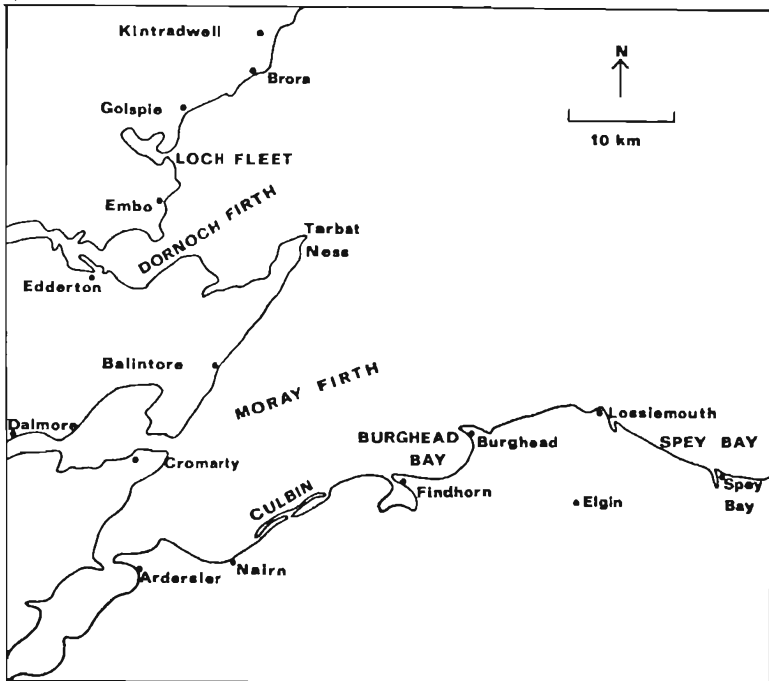


Figure 1. The study area.

### Results and discussion

**Numbers** In the Moray Firth Red-throated Divers were the most numerous species during the winter and only small numbers of Black-throated and Great Northern Divers were present. In April and early May, when most Scottish Red-throated and Black-throated Divers are back on their breeding grounds, small numbers of Great Northern Divers were present (Table 1). The much smaller numbers of Red-throated and Black-throated Divers recorded in March 1982-83 may have indicated an early departure towards the breeding grounds. Considering the large numbers of divers present the occurrence of White-billed Divers *Gavia adamsii* was not unexpected and single birds were observed on three occasions (7.3.82; 30.10.82; and 24.11.82)—(subject to approval by BBRC). There have been occasional sightings of this species in the Moray Firth in the past (Lees, 1959, Pennie, 1963) and more recently at Golspie (SBR 1978) and Banff Bay (SBR 1979)

From the 1969-75 Birds of Estuaries Enquiry, Prater (1981)

**Table 1. Monthly counts of all divers in the Moray Firth, 1981-82 and 1982-83**

	Oct.		Nov.		Dec.		Jan.		Feb.		Mar.	
	1982	1981	1982	1981	1982	1981	1982	1983	1982	1983	1982	1983
Red-throated Diver	1532	191	260	29	59	25	89	26	53	60	16	
Black-throated Diver	19	5	15	1	1	2	5	2	23	3	0	
Great Northern Diver	12	6	15	7	3	1	8	13	19	27	6	
White-billed Diver	1	0	1	0	0	0	0	0	0	1	0	
Diver sp.	7	214	0	9	0	58	3	75	28	109	6	
TOTAL (all divers)	1571	416	291	46	63	86	105	116	123	200	28	

estimated a minimum of 140 Red-throated Divers, 65 Great Northern Divers and 35 Black-throated Divers in the Moray Firth. However Mudge and Allen (1980) thought it likely that between 500 and 1000 divers were present in the area during the winter. The present study shows that diver numbers are higher (estimated 1500+) in the early winter, when many would be passage birds, with smaller numbers in mid and late winter (estimated 200-650). A flock of nearly a thousand Red-throated Divers in October off Culbin Forest is one of the largest concentrations of that species so far recorded in the Western Palearctic. In North America flocks of up to 1200 Red-throated Divers have been recorded on Lake Ontario in October (Palmer 1962).

In both years divers showed a preference for areas of shallow water over a sandy substrate, as in the Dornoch Firth, off Culbin Forest and in Burghead and Spey Bays (Table 2). Divers were seen only in very small numbers off the rocky shorelines. Red-throated and Black-throated Divers generally occurred within 2 km of the shore and few were observed further offshore during aerial and boat surveys. Shore-based

**Table 2. Peak monthly area counts of all divers, 1982-1983**

	Oct.	Nov.	Dec.	Jan.	Feb.	March
Kintradwell - Golspie	11	9	4	5	13	15
Dornoch Firth	230	45	20	9	33	13
Tarbat Ness - Chanorry	4	2	5	12	17	6
Ardersier - Nairn	0	4	2	4	5	0
Culbin Forest	993	98	38	38	53	2
Burghead Bay	111	71	19	25	19	4
Burghead - Lossiemouth	0	8	1	8	15	5
Spey Bay	310	348	390	56	50	10
TOTAL	1659	585	479	157	205	55

observations therefore probably gave a reasonable assessment of overall numbers and no significant concentrations are likely to have been overlooked. However aerial and boat surveys indicated that Great Northern Divers regularly occurred further offshore (but within 10 km) and in greater numbers than land-based observations suggested. In November 1982, for example, 15 Great Northern Divers were recorded from the shore and 52 from a boat (G. P. Mudge pers. comm.) over the same period. On only one occasion was a diver observed at a distance greater than 10 km from the shore in the Moray Firth. This appears to be the case throughout the North Sea with the exception of a concentration of Red-throated Divers observed over 50 km from the west coast of Denmark (B. Blake pers. comm.).

**Moult** Divers have distinct winter and summer plumages. In the field the areas where moult can be most easily assessed are the neck, throat and mantle. As most divers were within 1 km of the shore the plumage characteristics of each individual could be observed. Unidentified divers and divers at distances too great for the plumage characteristics to be ascertained with any degree of certainty were omitted from the results (21.6% of all birds were in this category).

Red-throated Diver (Fig. 2a). A complete post-breeding moult takes place from late September to December (Cramp and Simmons, 1977). In late October 73% of all Red-throated Divers ( $n=1879$ ) were in body moult and none was in summer plumage. By early December birds had attained winter plumage. A partial pre-breeding moult of body, tail and some lesser wing coverts takes place from February to early April and the first birds are in full breeding dress by mid-April (Cramp and Simmons, 1977). No concentrations of moulting Red-throated Divers occurred over this period in the Moray Firth. This may in part be explained by some Scottish birds being back in the breeding areas from late February onwards and completing their moult there (pers. obs.), or different areas may be used for the spring moult. Individuals in full summer plumage were noted as early as the third week in February.

Black-throated Diver (Fig. 2b). Unlike Red-throated Divers only a partial post breeding moult takes place in the autumn and a complete pre-breeding moult from January onwards (Cramp and Simmons, 1977). This accounts for the high percentage of summer plumaged and moulting birds observed during October and November. Few birds were observed in late winter, suggesting the use of alternative sites for the spring moult eg. the Brittany coast (Hope Jones *et al* 1978).

Great Northern Diver (Fig. 2c). The pattern of moult is

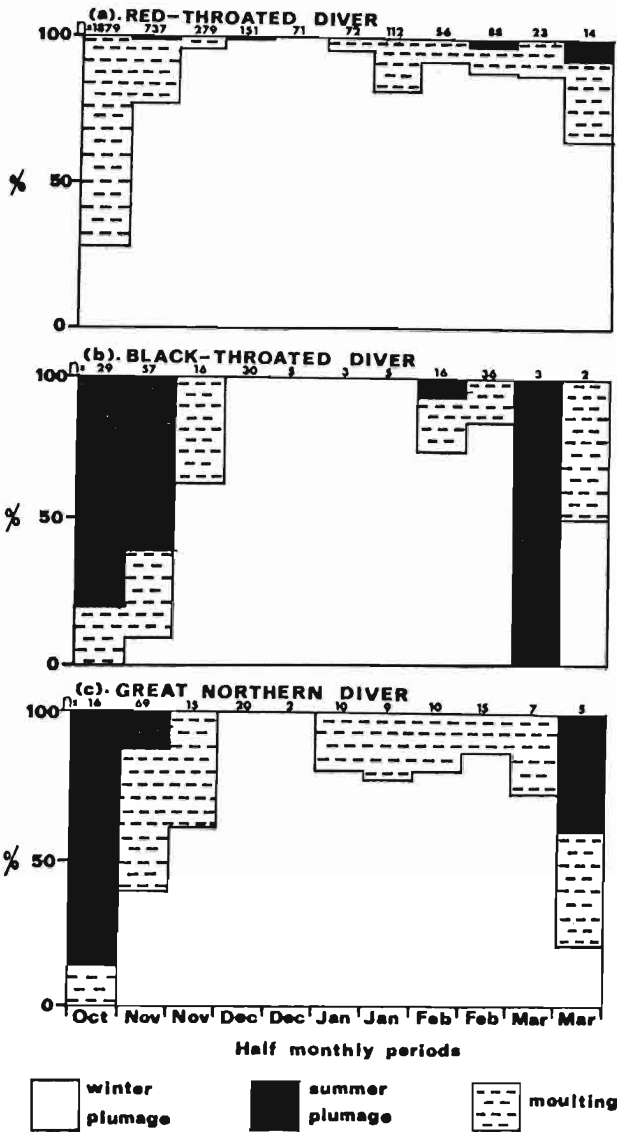


Figure 2. Proportions of Moulting, Winter and Summer Plumaged Divers in the Moray Firth, October 1982 to March 1983.

similar to that of the Black-throated Diver, though the complete pre-breeding moult takes place slightly later, between February and May (Cramp and Simmons, 1977). Observations in the Moray Firth confirmed this pattern with summer plumaged and moulting birds present into May when the other divers had departed.

About 700 pairs of Red-throated Divers breed in Shetland (Gomersall *et al* 1984) and probably several hundred pairs in Orkney, the Western Isles and mainland Scotland. Ringing recoveries of birds from Orkney and Shetland (few are ringed elsewhere in Britain) indicate that at least some birds from the Scottish breeding population frequent the Moray Firth (Spencer and Hudson, 1982). Significant oil reserves are now being exploited in the Moray Firth. Such a large concentration of Red-throated Divers (particularly moulting birds) would be especially susceptible to an oiling incident and the impact on the British breeding population could be serious. The 'Amoco Cadiz' incident emphasized the vulnerability of moulting divers to oil pollution (Hope Jones *et al* 1978).

### Acknowledgments

We should like to thank Drs James Cadbury and Lennox Campbell for making helpful comments on the text and Drs B. Blake and G. P. Mudge for providing unpublished data on diver numbers at sea. We are grateful to Britoil for funding the research.

### Summary

Regular counts of divers in the Moray Firth in the winters of 1981-82 and 1981-82 showed peak numbers (1500+) of Red-throated Divers to be present in October.

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PLATE 20. Sir Arthur Duncan, first  
Chairman of the SOC and an  
outstanding contributor towards  
conservation in Britain (see p. 160).

*The Field*



PLATE 21. Collaboration between Glasgow University and the Northumbrian Ringing Group: a successful catch of Goosanders (p.155).

*R. W. Furness*

PLATE 22. A round-up of Mute Swans from the large moulting flock on Montrose Basin.

*Dundee Courier*

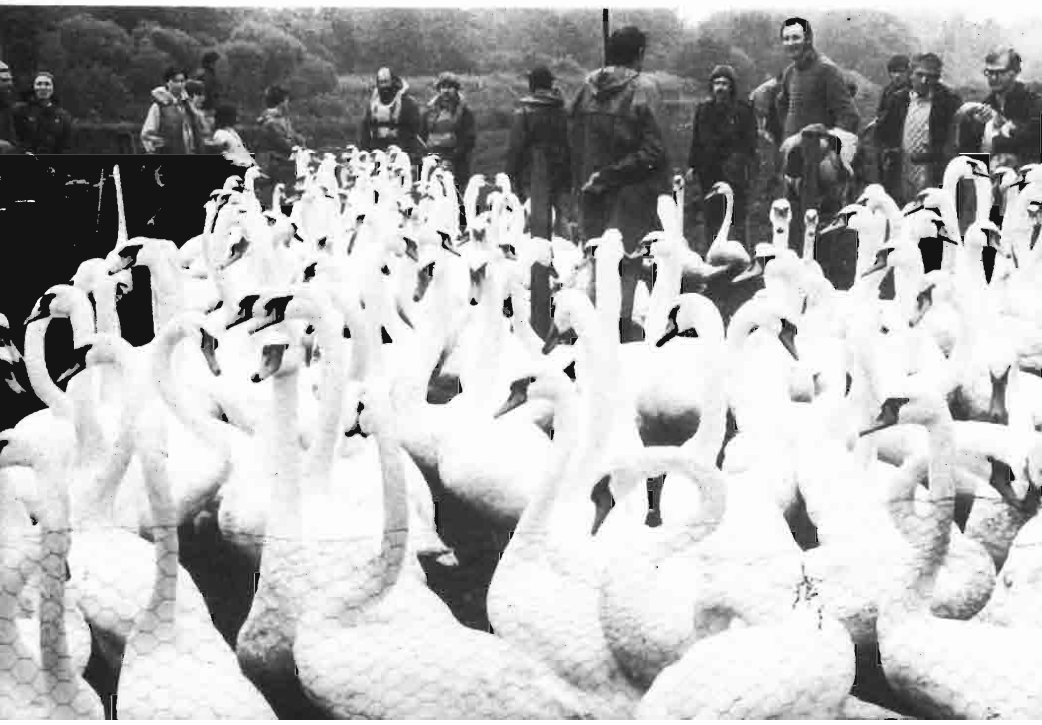






PLATE 23. The work of the Raptor Study Groups (p. 162) gives a valuable record of breeding success. Many new Merlin nesting sites (above) were located in 1984, while Peregrines responded to the warm dry summer with a high rate of breeding success.

Upper — *R. T. Smith*

Lower — *W. S. Paton*



PLATE 24. Golden Eagles did not do so well in 1984, with some deserting during the late-March snowfall and regrettably high numbers of egg and chick losses.

*B. S. Turner*



## Bird research at the University of Glasgow

R. W. FURNESS

*Much of the ornithological research undertaken in Scotland is little known to most SOC members. This article is the first in a series which will provide a resumé of current work by the universities and other professional bodies.*

Reputations, like elephants, take years and years to grow, so many people may not yet be aware that Glasgow University has recently become a centre for ornithological research. We have rapidly gathered one of the largest groups of ornithologists at any British university. This has been a swift development, and it is not really clear why it has taken place; my own appointment for example was to teach Human Biology, and not specifically to study birds! Professor Newth, who was until recently head of the Zoology Department was also on the Nature Conservancy Council and probably deserves the credit.

A common theme to most of our bird research is the relationship between birds and man, from conservation at one end of the spectrum to the control of bird pests at the other. This theme ranges from studies of the influence of changing patterns of farmland use on the population biology of the Lapwing, to the role of gulls as vectors of human pathogenic bacteria. The distinction often made between professional and amateur ornithology is an artificial one; there is, for example, clear overlap between university and Clyde Ringing Group interests in the waders of the Clyde, and in studies of seabirds by Bernie Zonfrillo, Sheila Russell and Tom Daniels. However, since most university research projects are funded for only a two or three year period, there is less scope for integration with amateur studies than one might wish, since the latter tend to be low-input but long-term. Our university research projects have provided some expenses-paid trips to Shetland or St Kilda in return for field assistance. The other major activity where amateur assistance has been valuable is cannon netting. This conjures up images among the uninitiated of nets full of 1000 or more waders, whereas in reality we put in a great deal of effort and usually catch either 100 gulls on a smelly refuse tip, a dozen Turnstones on a rocky shore, 50 Lapwings on the estuary, or (too often) nothing. The birds caught have to be laboriously measured in some detail. We

have had catches of 1000 or more, but these are less valuable than might be imagined because it is impossible to process such large catches to obtain detailed biometric information. Consequently, most amateurs find cannon netting less exciting than they expected, and only a dedicated few maintain enthusiasm. However, ringing is an important tool in our work. Last year our combined studies resulted in ringing of over 20,000 seabirds alone, including several thousand Kittiwakes in arctic Norway and hundreds of albatrosses in the south Atlantic. Such large data sets and the subsequent recoveries or sightings of individually colour ringed birds could not be handled without a computer, and we are fortunate to have an excellent technician, Kenny Ensor, who spends much of his time organising computer storage, updating and analysis of these records.

A good example of the value of collaboration between professional and amateur is to be found in our Manx Shearwater studies. Laughton Johnston, NCC Chief Warden on Rhum, stimulated our interest in these birds because he felt that there was a need for conservation-related work at this, the largest colony of the species in Europe. Peter Wormell described the colony in *Scottish Birds* and estimated, from aerial photographs taken in the 1940s and quadrat counts of burrows made in the 1960s, that there were 119,000+ Shearwater burrows on the island. Little else is known about the population, except that numbers on the adjacent Small Isles seem to have declined considerably due in part, it would appear, to predation by rats.

While Kate Thompson is engaged on a three year study of shearwater breeding biology on Rhum, a complementary study by teams of American volunteers (through the auspices of "Earthwatch") will map the present colony locations and count burrows in a proportion of these. Earthwatch volunteers are reputedly keen and hard-working; they will need to be since the 100,000 or so burrows are mainly over 600m above sea level on the Rhum summits ! This study should give a firm baseline from which to monitor changes in shearwater numbers in future.

Seasonal changes in weight, moult and mortality in the Herring Gull have been investigated, providing evidence that, while Herring Gulls seem to have no problems with food supplies in winter, breeding appears to be a major stress. Herring Gulls from north Norway, which can be identified by measurements and plumage details in the hand, visit the east coast of Scotland in large numbers, but hardly any cross over to the west. Do they dislike flying across Scotland ? Is Strathclyde

already full of Scottish Herring Gulls? Herring Gulls often carry *Salmonellae*, though there is as yet no evidence to suggest that these infections harm the gulls. Interestingly, Herring Gulls from the east coast are less contaminated than those on the west of Scotland. Is this because gulls in east Scotland spend a higher proportion of their time feeding around fishing boats whereas those on the west of Scotland are more dependent on refuse tips? Such questions are obviously of interest in relation to our understanding of gull ecology but they also have important applications. Shortly after an outbreak of food poisoning on Islay the causative strain of *Salmonella* was also found in gulls on the island. Are gulls important as vectors of such disease? Undoubtedly they can cause serious contamination of drinking water supplies through their habit of roosting on reservoirs. By establishing a successful programme of gull-scaring, using taped gull distress calls, the huge winter flocks of gulls have been moved away from the main Glasgow reservoirs to the Clyde estuary and Loch Lomond, where the excrement and bacteria they defecate do no damage. This achievement has saved Strathclyde Region millions of pounds in capital costs (the cost of building a purification plant capable of dealing with the extra load of suspended solids and bacteria produced by the gulls) and an annual sum of thousands of pounds for the extra chlorine needed to treat the water before the gulls were dispersed.

Among birds, Wigeon are probably the smallest species that feed on grass. Recent studies on the Solway have investigated how such a comparatively small bird is able to get enough energy to survive the Scottish winter. There seems to be unlimited grassland around the Solway, but Wigeon feed only in tight flocks and confine their grazing to a few small areas near water. They are rather like tiny lawnmowers, concentrating on a few patches where they cut the grass close to the ground, then leave the area for a few days to allow it to regrow, and then return again to the same patch. The advantages of this feeding method are being investigated with a view to understanding what type of grassland community is best for these ducks and how their winter feeding sites can be improved. Similar work is now starting on Islay, where we hope to persuade the Barnacle Geese to graze in areas where they are welcome, and deter them from other sites. So, on your next trip to Islay watch out for fields of plastic geese—decoys which may help to encourage birds to land, or other models which might scare them away.

Both mercury and cadmium are highly toxic to man but although there have been serious local instances of pollution

by discharge or misuse of these elements, little is known about the degree of contamination in the seas and oceans and the proportions of mercury and cadmium in marine animals which are there due to man and due to natural processes respectively. Recent work by Sandra Muirhead has shown that Great Skuas, Fulmars, Storm Petrels and Leach's Petrels have very high levels of these elements. We are about to start measuring the concentrations of mercury in the feathers of seabirds collected last century and placed in museums. Birds put mercury into growing feathers in proportion to the amount of mercury in their blood at the time, and this has been used by Scandinavian researchers to measure the increase in mercury pollution of Baltic seabirds. We hope that similar measurements from our Scottish seabirds will allow us to detect any long-term changes that may have taken place in Scotland.

The threats to seabirds presented by oil developments in the North Sea, and now to the west of Scotland as well, are much publicised and often exaggerated. The possible effects of changing patterns of fishing are less widely known, and are not well understood. I developed a computer model to estimate the quantity of fish eaten each year by seabirds around Foula and my calculations show that seabirds consume a much higher proportion of fish stocks than is generally realised. Similar results have been obtained by a number of American ecologists. These, and some recent theoretical studies, imply that overfishing by man is likely to have an important influence on seabird populations. The overfishing of predatory cod and haddock, and of herring and mackerel, has allowed the population of sandeels in the North Sea to increase. Since these are the staple diet of most breeding seabirds, this is one important factor contributing to the seabird population expansions which have recently been taking place. Now greater effort is being put into fishing for sandeels, and it is likely that an unchecked increase in sandeel fishing would have an adverse effect on seabirds. Making clear statements about this interaction is difficult, since we know rather little about sandeel biology. Surprisingly, we also do not know what actually limits the size of most seabird populations, although this has long been a subject of speculation by ecologists. Most ecologists believe that seabird numbers are held in check by density-dependent competition for food or for nest sites. However, this has yet to be proved, and recently models of the impact of oil pollution on seabird populations have assumed that no such density-dependent processes occur. It is important that we sort this question out. If seabird popula-

tions are regulated by food supplies then losses caused by oil spills may not cause any reduction in the breeding population. If seabird populations are not regulated, then every bird killed by oil will bring the population one closer to extinction. Similarly, while we can (with difficulty) monitor changes in sizes of seabird populations, we need to understand the way in which the populations are regulated before sensible conservation measures can be applied.

Current ornithological projects within the Zoology Department are: Barnacle Goose management on Islay (Stephen Percival); Lapwing breeding in relation to agricultural land-use (Hector Galbraith); Manx Shearwater ecology in relation to rats on Rhum (Katherine Thompson); The role of fish offal and discards in seabird ecology (Anne Hudson); Audouin's Gull biology and conservation on the Chafarinas Islands (Patricia Bradley); Grazing ecology of Wigeon (Peter Mayhew); Heavy metal accumulation by seabirds and fish (Sandra Muirhead, Malou Cuvin); Vulture ecology (David Houston); Herring Gull ecology (Patricia Monaghan, Colin Shedden, Kenneth Ensor, Heather Wright, Kevin Bayes, Colin Fricker, Cheryl Whelan); Great Skua ecology (Robert Furness); Chough biology on Islay (Patricia Monaghan); Vigilance and foraging in wader flocks on rocky shores (Neil Metcalfe); Ecology of South American Vultures (David Kirk); Feather development (Roger Downie); Early embryology of birds (Donald Ede).

Scientific accounts of some of our work may be found in the following selected references:

- COULSON, J. C., MONAGHAN, P., BUTTERFIELD, J., DUNCAN, N., ENSOR, K., SHEDDEN, C. & THOMAS, C. 1984. Scandinavian Herring Gulls wintering in Britain. *Ornis Scand.* 15: 79-88 ■ FURNESS, R. W. 1984. Influences of adult age and experience, nest location, clutch size and laying sequence on the breeding success of the Great Skua. *J. Zool. Lond.* 202: 565-576 ■ FURNESS, R. W. 1984. Seabird-fisheries relationships in the northeast Atlantic and North Sea. pp 162-169 in Nettleship, D. N., Sanger, G. A. & Springer, P. F. (eds.) Marine birds: their feeding ecology and commercial fisheries relationships. Canadian Wildlife Service, Ottawa ■ FURNESS, R. W. & BIRKHEAD, T. R. 1984. Seabird colony distributions suggest competition for food supplies during the breeding season. *Nature* 311: 655-656 ■ GALBRAITH, H. 1984. The diet and feeding ecology of breeding Kittiwakes *Rissa tridactyla*. *Bird Study* 30: 109-120 ■ MONAGHAN, P., COULSON, J. C., DUNCAN, N., FURNESS, R. W., SHEDDEN, C. B. & THOMAS, C. 1983. The geographical variation of the Herring Gull within Britain and northern Europe: a biometrical approach. *Ibis* 125: 412-417 ■ METCALFE, N. B. 1984. The effects of mixed species flocking on the vigilance of shorebirds: who do they trust? *Anim. Behav.* 32: 930-937 ■ METCALFE, N. B. & FURNESS, R. W. 1984. Changing priorities: the effect of pre-migratory fattening on the trade-off between foraging and vigilance. *Behavioural Ecology and Sociobiology* 15: 203-206.

Robert W. Furness, Department of Zoology,  
University of Glasgow, G12 8QQ

## Sir Arthur Duncan 1909-1984

By the death of Sir Arthur Duncan, Scotland has lost an outstanding personality and one of its ablest and most influential naturalists. The SOC has lost an Hon. President whose far-sighted guidance dated from the Club's foundation. I can remember George Waterston saying in 1936 that Arthur Duncan (then aged only 27) was the man to be chairman. He held that office with distinction throughout the pre-war years and again after the war until 1952.

Born and brought up in rural Dumfriesshire, Arthur Bryce Duncan farmed at Gilchristland for much of his life. He was at school at Rugby and took a first-class degree in Agriculture at Cambridge, where David Lack, Peter Scott and Freddy Spencer Chapman were among his contemporaries. He joined with these and others to found the Cambridge Bird Club (originally the Cambridge Ornithological Society), which pioneered new techniques of field ornithology. In those days holidays were often spent exploring the natural history of the Hebrides from his father's yacht, and in July 1929 he landed on North Rona with his brother John and the Rev. J. McWilliam. When the BTO was founded in 1933 Arthur was one of the few ornithologists in Scotland with the vision to see its great potential.

His grandfather had founded tea gardens in Assam and Arthur was for long a Director of the family firm. His marriage in 1936 to Isabel Kennedy Moffat, whom he had known since childhood, began a happy and enduring partnership. After their much-loved house at Gilchristland was destroyed by fire in 1942, they lived for 15 years at Tynron where his old friend the Rev. J. McWilliam was minister. As a young bird artist I was invited into the warmth of the Duncan home and I have unforgettable memories of fascinating and often hilarious evenings when he and "The Minister" argued, reminisced and planned the future of Scottish ornithology.

At the height of his career, in the post-war years, Arthur Duncan assumed a remarkable range of voluntary responsibilities, in addition to being a busy farmer. Some thought he might have looked to Westminster but he chose local government. A lifelong Conservative, he was for many years Conventor of the Dumfries County Council and became Lord Lieutenant of the county from 1967-69. He had a strong Christian belief, firmly anchored to the Church of Scotland, and for many years was Chairman of the Board of Management of the Crichton Royal Hospital at Dumfries. From 1939-1965



he was Chairman of the Galloway Cattle Society, working tirelessly to raise the Galloway breed from local to national status, and in 1965 was elected President of the Smithfield Fatstock Club.

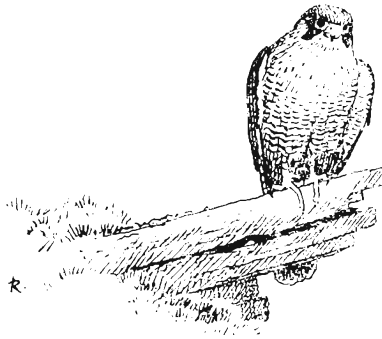
Perhaps nothing gave him more satisfaction than his long and fruitful Chairmanship of the Nature Conservancy. He took over from Sir Arthur Tansley in 1953 and retired in 1961, when he was knighted for his services. He personally persuaded Max Nicholson to come into the Conservancy as Director-General. In after years he liked to recall the heady days when together "they saw things through", including the establishment of many National Nature Reserves. In these formative years his far-sighted initiative established Conservancy support for the BTO and the Wildfowl Trust and in the international field for the IUCN and the ICBP. Fair Isle was another demanding interest. He was Chairman of FIBOT from its foundation in 1948 right up to 1984. Without his and Ian Pitman's support George Waterston's dream might never have been fulfilled. It was natural that he should also be made a Council member of the Scottish Wildlife Trust from its establishment in 1964. As President of the Dumfries and Galloway branch his personal contact with landowners and, above all, his detailed knowledge of sites were invaluable in the acquisition of reserves.

Arthur Duncan will be remembered by his friends as a marvellously stimulating companion, learned, witty, often provocative in talk. He never lost a youthful enthusiasm and curiosity about every facet of nature, especially the lives of birds, mammals and insects. It was particularly fascinating to hear him talking with great knowledge about Rooks, Crows and game birds. He said that he took up a new group of insects every year. In late years he made an intensive entomological study of Torrs Warren on the Wigtownshire coast and was greatly delighted when in 1984 he found there the parasitic bee *Epealus variegatus*, new to Scotland. In younger days he had made a large collection of bird skins; both this and his beautifully arranged and documented collection of insects are now in the Royal Scottish Museum. He was intensely interested in how land was used and increasingly deplored what he saw as excessive conifer afforestation in South-west Scotland. His attitude to wildlife was without sentimentality. Shooting pheasants or grouse (he was a first-class shot) was as much part of his outdoor life as collecting moths or tipulids. On the day of George Waterston's funeral he and I arrived early and leant over the old bridge at Humble. In a flash he spotted some interesting flies below. *Sotto voce* and smiling almost

shyly he said "George wouldn't mind if I fetched my net from the car, would he?"

He liked to think of himself as an amateur naturalist, but from his youth he had absorbed scientific methods of study, which enabled him to have easy discussion with professionals. His great strength as a Chairman was his ability to concentrate on essentials and make swift, firm decisions. He was usually sure he was right and did not hesitate to mortify a troublesome opponent with a barbed response, though often with a mischievous twinkle in his eye. Some will regret that his full life left too little time and energy for synthesising his great knowledge of wildlife in South-west Scotland in published form, but he was happy to go on exploring new fields of study for his own satisfaction. This large, generous and brilliant man will be remembered for himself and particularly for his major contribution to the Conservation of Nature in our time.

DONALD WATSON



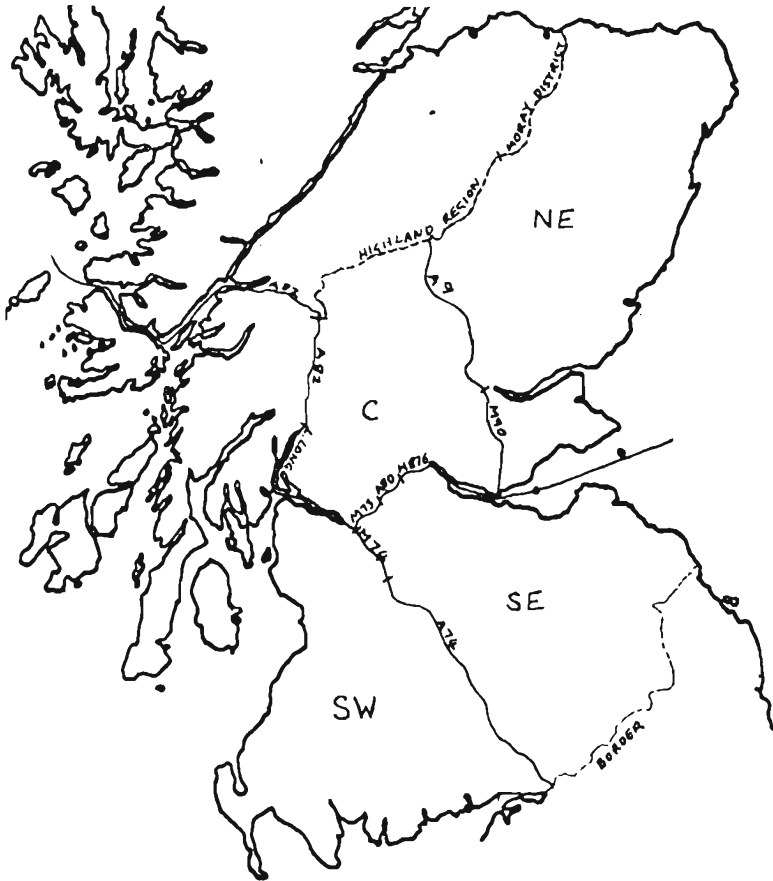
PEREGRINE R. A. Richardson

## Raptor Study Group Reports

### Introduction

This report summarises the main activities of the four Raptor Study Groups now active in Scotland. The map shows the area covered by each group—North-east Scotland (NE), Central Scotland (C), South-east Scotland (SE) and South-west Scotland (SW) (which includes the islands of Bute and Arran). This is the fourth annual summary for NE but the first for the other three.

Species studied include Golden Eagle, Peregrine and Merlin, with some members specialising in other raptors such as Hen Harrier and Kestrel. Although Merlins have attracted a great deal of interest, particularly in the North-east, the most comprehensive survey and census work has been confined to Peregrine and Golden Eagle; this report is therefore mainly concerned with these latter two species.



### Golden Eagle

**North-east** At least 26 pairs were located of which 10, probably 12, were successful, an identical figure to 1983. A spectacular snowfall towards the end of March undoubtedly caused some early desertions—one pair re-laid after this, however, and the single young bird fledged successfully. Other failures were, on two separate occasions, due to nests falling off cliffs; one clutch was stolen and 2 half-grown chicks were taken from one nest by 'persons unknown'.

Other items of interest were a pair which laid 3 eggs, successfully raising 2 young, and the sighting of a pair of Eagles, a pair of Peregrines and an Osprey 'interacting' with one another, witnessed by a delighted group member. Prey items included the usual quantity of hares and Grouse, with Ptarmigan taken by high ground pairs. Four eaglets were ringed.

**Central** Within this large area a wide range of habitat is utilised by

Golden Eagles. Some home ranges are centred on "good heather" hills supporting large numbers of Grouse, hares and other potential prey, while others consist of poor sheep-walk where red deer and sheep carrion form the main food items although occasionally supplemented by more unusual prey.

Although not all territories were intensively studied in 1984, those which were examined included the majority of historically successful sites. A total of only 4 fledged young was disappointing, to say the least. The fact that at least 8 pairs laid eggs only to fail (one chick died and one 'disappeared' at 5+ weeks) must give rise for concern. At 2 sites, possibly 3, eggs were stolen by persons unknown. An eyrie in the Loch Tay area produced this year's most unusual prey item—an immature Gannet!

**Table 1 Golden Eagle breeding success in 1984**

	North-east	Central
Home ranges/sites with bird(s) present	39	17
Home ranges/sites with adult pairs	24?	
Home ranges/sites in which eggs laid (probably)	21†?	12(1)
Home ranges/sites in which eggs hatched (probably)		6
Home ranges/sites in which eggs failed to hatch eggs or small young disappeared naturally	5(2)*	
Home ranges/sites at which young fledged (large young seen but fledging not proved)	10(2)	4
Total young fledged (probably fledged)		4

†One pair re-laid; their first clutch is not included in these totals.

\*One clutch considered stolen; another brood of 2 chicks was stolen. A clutch and a brood were lost when the two nests fell off cliff.

### Peregrine

**North-east** Warm, dry weather during the critical late April/early May period undoubtedly helped this species, with fledged young seen at 37 sites and at least 86 young birds recorded—a vast improvement on 1983. Failures were again caused by interference, with 2 definite and 4 probable clutches stolen (2 pairs successfully re-laid but another pair lost its repeat clutch also); and 4 definite and 1 probable broods stolen. Coastal pairs fared poorly again in 1984, with only 1 pair successful out of 5 checked.

Prey items are always worth a second glance—unusual items this year included Goldcrest and 2 Turnstones, but the prize must go to Keith Brockie's Rose-ringed Parakeet found at an inland eyrie!

**Central** Over much of the area Peregrines responded to the warm dry weather and success rates were very high, with around 100 young successfully fledged. To balance this, however, breeding success was very poor in Dunbartonshire, several eyries being unoccupied or with a single bird only. (J. Mitchell)

Robberies are still occurring, with 7 definite and 4 probable thefts of eggs or young; also disturbing was evidence of failure due to interference by gamekeepers at two sites. An early ringing recovery was of a young female which was shot approximately 40 km to the NE of its nest site 2 months after fledging. After treatment the bird was released back into the wild—an unusual happy ending!

**South-east** To start on a cheerful note, 1984 was by far the most successful breeding year on record with 34 fledged young from 11 successful sites, including 6 broods of 4 young. Numbers are building up again after the 'crash', with the only worrying area being the continuing failure of coastal birds (see also NE report); one Fulmar-oiled adult was seen at a failed site but the inaccessibility of sea cliff eyries limits a full study.

Three sites failed this year due to what one member calls "game-keeperitis"—it is sad to think that in 1984 there are still a minority who persist in persecuting these magnificent birds.

**South-west** Despite the many problems Peregrines face in this area they managed to produce a total of over 105 fledged young in 1984—a source of great delight for, and tribute to, those 'Peregrine workers' who have been monitoring this population since 'the bad old days' of the pesticide crash.

With at least 14 eyries robbed (3 of these robbed twice by thieves who returned for repeat clutches) despite increased surveillance by RSPB staff and raptor workers, I would like to make a plea for any members of the public to report suspicious activity at or near nest sites to the RSPB in Edinburgh and/or local police. As the table shows production from successful nests was high—the majority of birds had access to a regular supply of high quality food and no reports were received of unusual prey items.

**Table 2 Peregrine breeding success in 1984**

	NE	C	SE	SW
Home ranges/sites with bird(s) present	86	71	16	74
Home ranges/sites with eggs laid (probably laid)	63(+3)	51(8)	12(2)	58(+3)
Home ranges/sites with eggs hatched (probably hatched)	43	42(3)	11	43(+2)
Home ranges/sites with young fledged (probably fledged)	37	41(3)	11	40(+2)
Total young fledged (probably fledged)	86+	99+(5)	34	105+

### **Kestrel**

**South-west** Gordon Riddle has made a special study of Kestrels over a large section of the group's area over the last ten years. This year's figures show a very high rate of success—55 territories were monitored, 94% of all eggs laid hatched and 88% of chicks fledged. Laying dates were earlier than previous years and this, allied to favourable weather conditions, appeared to be significant in contributing to these birds' phenomenal success this year.

### **Hen Harrier**

**South-west** This species is having very mixed success in SW Scotland—very much depending on which area they choose to attempt to breed. Those which chose to breed in Ayrshire were unfortunate this year. Of 9 sites monitored in one large area 7 failed, with eggs or chicks deliberately destroyed at 6 of them. When it comes to Hen Harriers we are still living in the 19th century so far as some keepers are concerned, and this is by no means confined to SW Scotland. Areas without keeping pressure, in particular areas of young forestry, are supporting healthy and apparently, in some areas, growing populations but there is an obvious limit to this if they are persecuted as soon as they try to move out.

## Conclusion

A total of 50 occupied Golden Eagle ranges and 247 Peregrine sites were monitored. In addition many Merlin sites were monitored and many new ones 'discovered' in 1984. Other raptors such as Hen Harriers were also studied and work on these latter species will hopefully be intensified throughout all four areas in the future.

These figures represent a massive contribution in time and effort by a large number of raptor workers, the great majority of whom are voluntary and do this in their spare time. These notes are presented on behalf of all four Groups.

*Dave Dick, RSPB, 17 Regent Terrace,  
Edinburgh EH7 5BN*

## Reviews

**The Puffin** by M. P. Harris; Poyser, Calton; 1984; 224 pp; many illustrations; £12.60.

In the early 1970s it became generally known that the Atlantic Puffin had undergone widespread declines in numbers: its future seemed gloomy. It is hard to imagine that just fifteen years ago we knew so little about the population biology of puffins and other auks. The limited information then available suggested that auks like the Puffin which produce a single-egg clutch had very slow rates of population turn-over, and may take 50 years to double their population size. One wonders whether the Puffin would have received as much attention and research funding as it has if it had been as ugly as the Shag. Anyway the outcome has been over ten years of Puffin research by Mike Harris, beautifully summarised in *The Puffin*. The topics and organisation of this monograph are fairly standard: taxonomy, distribution, breeding, behaviour and population dynamics. But the presentation, content and production are all excellent. Mike Harris's clear, economic text is accompanied by graphs, tables, photographs and sketches, which together provide a comprehensive account of what makes Puffins tick. For many bird artists (including many of the 'big names') Puffins seem to pose particular problems, but not for Keith Brockie—his illustrations for this book are among the best there are. Harris's studies have revealed a great deal about Puffin biology, including the capacity of their populations to increase much more rapidly (up to 7% p.a.) than previously thought. In fact at many British colonies Puffin numbers have increased in the last few years—not because of anything Mike Harris has done, but probably as a result of changes in the marine environment. Harris is an optimist about the Puffin's future, but adds that we cannot be complacent. Simply because a once-threatened species is now doing well is not sufficient reason to stop studying it. Indeed, the recent increase in the commercial fishing of prey species (eg sandeels, sprats etc), could, in the not too distant future, have serious consequences for Puffins in Britain, as it has elsewhere (eg. Rost). However, I am not re-kindling the old Puffin death-wish, but emphasizing that if we are to understand the population dynamics of long-lived seabirds, then we need more long-term studies and more biologists who continue to be active and productive well into middle age!

T. R. BIRKHEAD

**The Birds of Orkney** by C. J. Booth, M. F. Cuthbert and P. Reynolds; The Orkney Press, 1984; 299 pp; 8 colour plates, 12 monochrome illus., 2 maps and many line drawings; £12.00.

This is the second book in a series of four entitled *Aspects of Orkney*. Since the publication of Eddie Balfour's small, but very useful, "Orkney Birds, Status and Guide" in 1972 there has been a considerably increased interest in the rich bird-life of Orkney due, in part, to the developing oil industry in these islands. "The Birds of Orkney" therefore draws a wealth of information from the several sources that have become available over recent years; wildfowl and wader counts, the cliff-nesting seabird monitoring programme and the annual "Orkney Bird Report". Thus the authors are able to show monthly or yearly changes in numbers for several species in their systematic list, as well as giving the likely location of most birds that a visiting birdwatcher in Orkney may wish to see.

Bird-ringing recoveries have been made use of where appropriate and there is a small section on the birds of Orcadian prehistory (it is interesting that the Fulmar, not known to breed in Orkney until 1900, is listed in this section).

Some inconsistency in the pagination at the beginning and end of the book, also an omission which leaves the reader guessing that Appendix 1 refers to Wildfowl Counts, detract little from this otherwise well-produced and important work on Orkney Birds.

SANDY ANDERSON

**ITEMS OF SCOTTISH INTEREST** Articles and reports on birds in Scotland, mainly on status and distribution, are listed here. Some biological studies are excluded, as are references from the widely available journals *British Birds*, *Bird Study* and *Ringing and Migration*. Most of these items are available in the Waterston Library. The librarian would be glad to receive reprints or papers on any aspect of ornithology.

Maternal nutrition, egg quality and breeding success of Scottish Ptarmigan. R. Moss & A. Watson 1984. *Ibis* 126 : 212-220.

*Wick High School Bird Report* for 1982. I. Mackay (ed) 1984. (32 pp). This is the last edition of this report. In future records will be submitted for entry in the *Caithness Bird Report*.

*Caithness Bird Report* for 1983. (31 pp). Available from Bird Bookshop £1.50 post free to SOC members.

*North-East Scotland Bird Report* for 1983. (60 pp). M. V. Bell (ed) 1984. Includes articles on wintering waders and on the Mute Swan in northeast Scotland. £2 post free to SOC members from the Bird Bookshop.

*Seabird 7*. (80 pp). Seabird Group. P. G. H. Evans & T. R. Birkhead (eds) 1984. Formerly called *Seabird Report*. Includes articles on Gannets, Auks and Petrels.

*A guide to Little Tern Conservation*. (114 pp). R. Knight & P. Haddon 1983, published by R.S.P.B.

Hill farming and birds—a survival plan. (68 pp). R.S.P.B. 1984.

Broadleaves in Britain—the RSPB view. (49 pp). R.S.P.B. 1984.

Solway winter shorebird survey 1982-84. (174 pp). M. Moser 1984. A report to the NCC and RSPB.

Seabird distribution in the North Sea—Final report. (438 pp). B. F. Blake, M. L. Tasker, P. Hope Jones, T. J. Dixon, R. Mitchell & D. R. Langslow 1984. Nature Conservancy Council, Huntingdon.

The structure and behaviour of the Whooper Swan population wintering at Caerlaverock, Dumfries and Galloway, Scotland—an introductory study. J. M. Black & E. C. Rees 1984. *Wildfowl* 35 : 21-36.

*Fife and Kinross Bird Report* for 1983. (34 pp). Available from the Bird

- Bookshop, £1.20 post free to SOC members.
- Shetland Bird Report* for 1983. (71 pp). I. S. Robertson (ed) 1984. Includes articles on the distribution and breeding of Ravens in Shetland, and breeding birds of Fetlar. Available from the Bird Bookshop, £2.00 post free to SOC members.
- Tay Ringing Group Report* for 1982-83. (79 pp). R. Summers & M. Martin (eds) 1984. Available from the Bird Bookshop, £1.50 post free to SOC members.
- North Sea Bird Club Report* for 1983. (83 pp). S. Anderson (ed) 1984. This is the 4th annual report of the North Sea Bird Club.
- Seabird colony distributions suggest competition for food supplies during the breeding season. R. W. Furness & T. R. Birkhead 1984. *Nature* 311: 655-656.
- Wildfowl and Wader counts* 1983-84. (48 pp). D. G. Salmon & M. E. Moser 1984. Published by the Wildfowl Trust, Slimbridge. Contains much of Scottish interest.

W. G. HARPER

## NOTICES AND REQUESTS FOR INFORMATION

**Conference** The joint 9th International Conference on Bird Census Work and the 7th meeting of the European Ornithological Atlas Committee will be held at the University of Dijon, Cote d'Or, France, 2-6 September 1985. The IBCC Conference will be mainly devoted to a special theme: "The influence of man on forest bird communities". The European Atlas Committee will be reviewing the progress on fieldwork for the European Atlas, which is due to start in the spring of 1985. An optional excursion will be organised in the Camargue and Provence, just after the Conference. For further information contact **Dr B. Frochot, Laboratoire d'Ecologie, Bâtiment Mirande, Université, 21000 Dijon, France.**

**Colonsay & Oronsay, Argyll** Recent private investigations of the bird life of these two islands are being used as the basis of a comprehensive account of the islands' avifauna by D. C. Jardine and J. & P. Clarke. This is being supplemented by the little published information available. Any records for inclusion (with due acknowledgment) would be gratefully received by **D. C. Jardine, 22 Bute Crescent, Bearsden, Glasgow G61 1BS.**

**Greenland White-fronted Geese** In 1984 88 geese were marked with white Darvic rings carrying a black engraved letter-digit-digit code reading up the leg. Sightings in autumn include 2 shot on passage in SE Iceland, 2 in Wexford and at least 8 on Islay. Information is sought on any further sightings—which can be expected in any Scottish Greenland White-front flock. Details wanted include location, date and if possible whether or not the bird was paired or with a family. If the code cannot be read, the leg on which the ring is placed will show if ringing took place in 1979 (right) or 1984 (left). Please send information to **David A. Stroud, Greenland White-fronted Goose Study, Kindrochid, Sanaig, Bruichladdich, Islay, Argyll.**

**Colour marked/wing-tagged Eiders** The Shetland Oil Terminal Environmental Advisory Group is interested in the movement of Eider ducks both within Shetland and between Shetland and neighbouring areas. On 19 November 1984 119 Eider were caught in Bluemull Sound, Shetland; the 63 drakes had their white plumage dyed yellow and were fitted with a darvic tag on the right wing, on which is a code of either one or



two black letters. The yellow dye should persist until the birds commence moulting in June. I would be most grateful if anybody seeing a "yellow" Eider could note the location, date, time of day, the number and sex of any accompanying Eiders, the letter code on the right wing and, if applicable, the direction of flight taken. Information should be sent to **Martin Heubeck, 3 Lighthouse Buildings, Breiwick Road, Lerwick, Shetland (Tel. 0595 4028).**

**Birds of Sea-lochs** Author writing review. Do you have published or unpublished research results which might be included? Contact **Dr J. C. A. Craik, SMBA, P.O. Box 3, Oban, Argyll** by early April.

## The Scottish Ornithologists' Club

### CHANGE IN LOCAL RECORDERS

**Caithness** Mrs Pam Collett has now handed over to Mr Sinclair Manson, 7 Duncan Street, Thurso, Caithness, tel no Thurso 62379.

**Fife & Kinross** Mr Ian Cumming has now handed over to Mr Douglas Dickson, 133 Duddingston Drive, Kirkcaldy, Fife.

**West Lothian/Forth Islands** Allan and Lindesay Brown have now handed over to Mr Ian Andrews, 36 Luton Place, Edinburgh EH8 9PG.

### THE GILMAN TRUST

The Club is very grateful to have recently received a grant of £1,000 from the Gilman Trust. £500 of this grant is to support the production of regional checklists and has already been allocated to the Borders and Lothians checklists which are now nearing completion. The remainder of the grant is being put towards the cost of updating the Club's office equipment and in particular a new electronic typewriter.

### BTO/SOC ONE DAY CONFERENCE

A joint BTO/SOC one day conference is being held on Saturday, 30 March 1985 at the Department of Forestry and Natural Resources, University of Edinburgh. The theme of the conference is breeding surveys and censuses and the speakers include Mike Harris on seabirds, Roy Dennis on Highland raptors, John Marchant and Phil Shaw on the CBC and its use in Scotland, and Rob Fuller on Hebridean waders. The BTO Shop and the SOC Bird Bookshop will be at the Conference. The Conference charge is £7.00 per person including lunch. Further details of the programme and booking are available from John Davies at the SOC.

### SOC ANNUAL CONFERENCE

The annual Conference and AGM will be held the week-end 1-2 November 1985 at the Marine Hotel, North Berwick, East Lothian. The Conference Programme and Booking Form will be distributed in early September with the autumn issue of *Scottish Birds*.

### 1984 RAFFLE

This year the sale of raffle tickets produced a net profit of £519, compared with £771 in 1983. A total of £974 worth of tickets were sold. The cost of printing 3,000 books of tickets was £280 and the cost of cash prizes was £175. We are very grateful to all those who bought and sold tickets. We would particularly like to thank the individuals and companies who donated prizes.

### SUMMER FIELD TRIPS

Details of the summer field trips organised by the branches are printed on a separate sheet enclosed with this issue of *Scottish Birds*.

## Recent Reports

*These notes include unchecked reports and are not intended as a permanent record, nor will they be indexed. Please send reports to Pete Ellis Houss, East Burra, Shetland, via local recorders at the end of March, June, September and December. The period October to December is covered here.*

Autumn migration brought a last flush of drifted summer migrants to the northern isles and parts of the east coast as late as mid-November, though by then winter visitors were arriving in considerable numbers. There were unusual influxes of some species, while the mild first half of the winter encouraged some birds which normally leave the islands to winter there.

There were late records of **Sooty Shearwater** (5 Oct.), **Storm Petrel** (28 Nov.) and **Leach's Petrel** (11 Oct.)—all in the northern isles. Among wildfowl the most notable reports were a record 20,000 **Pinkfeet** at Strathbeg, 35 **European Whitefronts** at Loch Spiggie, large parties of Svalbard **Barnacle Geese** at Fair Isle, Girdleness and Aberlady, and small groups of **Brent Geese** in several areas. Raptors visiting Fair Isle included a **Honey Buzzard**, a **Red Kite** and the wing-tagged **White-tailed Eagle** which has spent two summers in Shetland; elsewhere there were scattered records of **Rough-legged Buzzards**.

An elusive **Black-winged Stilt** on the Ythan in October was eventually found dead. Other noteworthy waders included **Lesser Golden Plovers** on Fair Isle and at Fife Ness in October, 12 **Jack Snipe** at Loch Spiggie in November, **Great Snipe** on Fair Isle and Lewis, a **Long-billed Dowitcher** at Kirkwall, 400 **Woodcock** on Fair Isle in mid-November, a very late **Greenshank** on Whalsay on 13 November, and an even later **Whimbrel** at Spiggie in early December. A **Wilson's Phalarope** at Hillend Reservoir in October was the best of a good autumn run of waders there. **Pomarine Skuas** appeared in various places eg 14 off Peterhead in October and 28 at Barns Ness on 3 November, when an immature **Long-tailed Skua** spent the day—dangerously—at the Beltonford roundabout at Dunbar! There were **Mediterranean Gulls** on the Ayr coast, an immature **Sabine's** at Peterhead, a **Ring-billed** at Aberlady, and a **Ross's Gull** still at Thurso in December. **Iceland** and **Glaucous Gulls** were scarce. **Sandwich Terns** again wintered in the Forth, where **Black Terns** were also seen. Over 500 emaciated **Guillemots** were found dead in Shetland, where increasing numbers have wintered recently. An influx of **Little Auks** in November brought 432 past Peterhead.

Fair Isle and Shetland had many of the unusual passerines, among them **Short-toed Larks**, a **Red-rumped Swallow**, **Richard's** and **Olive-backed Pipits**. A **Desert Wheatear** was at John O' Groats in December—but the bird of the period was a male **Siberian Thrush** seen by one lucky observer on S. Ronaldsay on 13 November. The largest counts of Scandinavian thrushes were 600 **Blackbirds**, 4500 **Fieldfares** and 4000 **Red-wings** on Fair Isle on 13 October. Late warblers included an **Icterine** in Orkney, **Barred** and **Bonelli's** in Shetland, a **Lesser Whitethroat** on Fair Isle, and a good scatter of **Yellow-browed Warblers**. A big influx of **Mealy Redpolls** occurred from early October, with flocks of up to 75 in Shetland, where a few **Arctic Redpolls** were also recorded. **Scarlet Rosefinches**, northern **Bullfinches**, **Lapland Buntings** and **Little Buntings** were reported in the north, and good numbers of **Snow Buntings** on the east coast. A **Yellow-breasted Bunting** on Fair Isle on 4 October was the latest ever.

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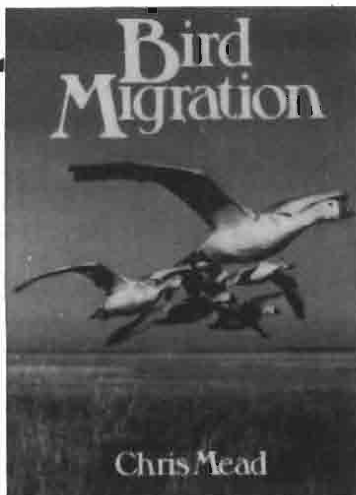
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## Review Quotes

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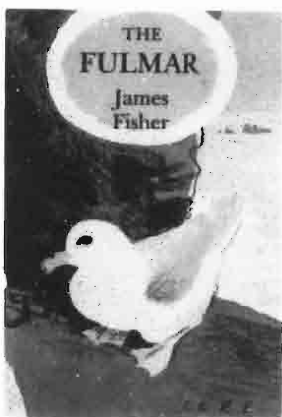
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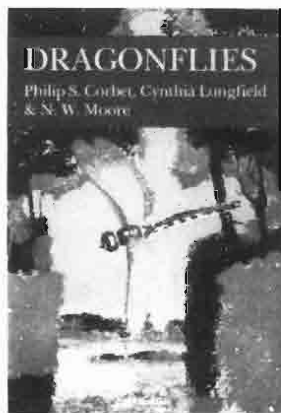
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