

SCOTTISH BIRDS



THE JOURNAL OF THE
SCOTTISH ORNITHOLOGISTS' CLUB

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SUMMER 1973

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21 Regent Terrace, Edinburgh EH7 5BT

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Vol. 7 No. 6

Summer 1973

Edited by Tom Delaney assisted by D. G. Andrew and B. G. Grattage

Editorial

Proposed changes in editorial and bookshop arrangements. Editing *Scottish Birds* is a task that provides its own rewards and satisfactions. But it does take a lot of one's spare time, and unavoidably the pressures on that spare time increase continually. Thus, with growing work and family commitments, we felt it wiser to acknowledge the inevitable and, with regret, decided to ask Council to seek a new editor.

Meanwhile, because of the increasing volume of mail-order book sales and other work arising from the growing membership of the Club, and in view of Mrs Waterston's wish to work only part time, Council had for some time been seeking an additional member of staff to manage the Club's bookshop.

Because of the difficulty of finding a successor to take on the editorship on an honorary basis, and since the post of bookshop manager was still vacant, it was considered that the two jobs might be combined and, given clerical assistance, carried out by one person, for they have a number of requirements in common: an interest in birds, some knowledge of ornithological and associated literature, and a general organizing ability.

It was therefore decided to advertise the combined post of Editor/Bookshop Manager and to employ an extra part-time assistant to cope with clerical work.

The new part-time assistant, Mrs Winkworth, has already started work at Regent Terrace, and it is hoped that an Editor/Bookshop Manager can be found soon and will be fully operational by the end of the year.

Local recorders. A full list of local recorders was published at the end of the spring number. Since then, changes have been caused by the resignations of Prof. T. C. Smout and W. A. J. Cunningham. No new recorder has yet been appointed for the Outer Hebrides, and for the time being observers are asked to submit their notes and records for that area to the Club Secretary. The West Lothian area will now be combined with Midlothian under the recordership of Bob Smith. An updated list will be found facing p. 320.

We are sure that observers in these areas will wish to join in thanking Chris Smout and Peter Cunningham for all their good work in the past.

Atlas successor is Habitat Register. The BTO announcement that the project to create a Register of Ornithological Habitats is to go ahead as a successor to the Atlas project will be welcomed generally and perhaps especially so in Scotland. The aim is to document all sites of ornithological interest and to produce for each a summary card, detailing its ornithological value. It is hoped that the availability of this register will be of value in conservation planning and especially in helping to defend important sites against threats of unsuitable developments. In this respect the concept of the Register may well be particularly useful in the face of the many oil-related development proposals affecting coastal and other sites of Scotland.

The survey will be based on the 10-kilometre grid, and the information to be recorded will be a brief description of each site, the species present, according to the season, and the rough numbers. Sites will be classified as of local, regional or national importance.

Much of this information is, of course, already available in the knowledge and notebooks of observers, and by gathering together this information and organizing a comprehensive survey the project will provide a valuable ornithological data base, from which it will be possible to measure the extent of destruction of habitats (and also the creation of new sites).

The Register should become a most useful tool in future conservation, and it is hoped that the survey can be completed in a short time scale to make the data available for use as soon as possible.

Current literature. Recent material of Scottish interest includes: Carrion Crows feeding on marine molluscs and taking fish. T. M. Clegg. *Bird Study* 19: 249.

Breeding birds of Ariundle Oakwood Forest Nature Reserve. K. Williamson. *Quarterly Journal of Forestry* 66: 243-255.

Success of Sparrowhawks in an area of pesticide usage. I. Newton, 1973. *Bird Study* 20: 1-8. Dumfriesshire study.

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Wader populations at Musselburgh

R. W. FURNESS

Between 1969 and 1973 observations were made to determine the numbers of waders frequenting the shore between Leith Docks and Cockenzie Power Station in the Firth of Forth and to discover where the birds fed and roosted. It was hoped that a comparison with unpublished counts made between 1959 and 1961 by J. Ballantyne would reveal the effects of man-made alterations of the coastal habitat. Information relating to past wader roosts in the area was provided by J. Ballantyne, D. I. M. Wallace and Loretto School Bird Club reports. For the period 1959-61 some 30 counts were available and there were 70 for the period 1969-73, and so the changes in numbers are considered to be accurately recorded.

Habitat changes

Land reclamation during 1959-71 removed less than one fifth of the area of mussel beds and a smaller proportion of the sand and rock areas previously available to the waders. In 1971, reclamation began at Seafield. It is assumed that the amount of food available to the waders remained unchanged during 1959-72, but in 1973 the reclamation at Seafield reached such a stage that waders were no longer able to feed there to any great extent.

Several changes have also taken place that have affected the roosting habits of the waders. A shingle spit formed at the mouth of the Esk and grew irregularly throughout the 1950's. Morrison's Haven, which held part of the wader roost before 1959, was filled in, forcing the birds to roost elsewhere. In 1964, at the mouth of the Esk, the construction of lagoons was begun for the dumping of waste ash from Cockenzie Power Station (plate 21). These were built on a roost site previously used by some of the waders. Construction was completed by 1966 and produced three lagoons filled with water and one, at the west end, only partially flooded. The east lagoon was first to be used for ash-dumping, which by 1969 had produced a semi-solid ash surface. By 1971 the east lagoon was full, and the ash had dried to a firm surface. Dumping began in the adjacent east-central lagoon, where a soft ash surface immediately formed.

Feeding areas

The study area was divided into sections according to substrate type. Where possible, physical barriers (e.g. sewage pipes) were used to demarcate the feeding sections, as this reduced the chance of missing or double-counting birds feeding near the boundary of a section (fig. 1).

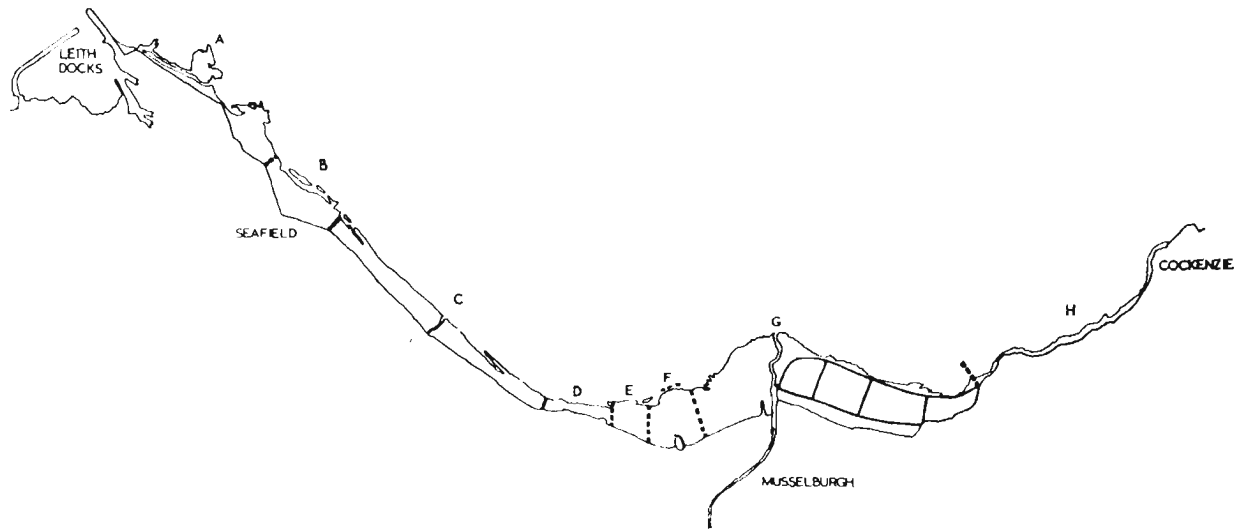


FIG. 1. South shore of the Forth estuary from Leith to Cockenzie, showing feeding sections A - H.

The numbers of each species feeding in each section were counted at low tide twice in January and twice in March. The four counts gave very similar results (table 1), except for Redshank, whose distribution in spring differed from that in mid winter, probably because large numbers were present during the spring counts. About 85% of the waders fed in two of the eight sections, half of them in section G. Some species had much more restricted feeding distributions than the population as a whole (table 2). In particular, Bar-tailed Godwits were found almost exclusively at Seafield. When this area was reclaimed the winter flock (about 700 in previous winters) fell

Table 1. Percentage of each species found in each feeding section, January 1971

	Section								Total Population
	A	B	C	D	E	F	G	H	
Oystercatcher	1	6	4	10	5	0	73	0	1000
Ringed Plover	0	38	25	0	0	0	38	0	40
Golden Plover	47	0	0	0	6	0	47	0	900
Turnstone	10	0	5	29	10	0	48	0	110
Curlew	4	8	6	4	4	0	75	0	140
Bar-tailed Godwit	0	98	2	0	0	0	0	0	420
Redshank	7	26	7	7	7	0	45	0	300
Knot	6	1	0	0	0	0	93	0	1650
Dunlin	6	67	0	0	0	0	28	0	2050
All Species	10	31	1	2	2	0	54	0	6600

to 200 in 1972/73, and these birds fed in sections C, D and F, where they had previously not been found. A similar decrease occurred in the numbers of Dunlin, some of which also found feeding sites in sections where they had previously been less numerous.

Table 2. Species with restricted feeding habitat

	Percentage of total population in one section
Bar-tailed Godwit	97 in B
Knot	93 in G
Dunlin	70 in B
Oystercatcher	70 in G
Curlew	70 in G

Results averaged from four counts made in 1971.

Roosting areas

Since the 1940's the whole Musselburgh wader population has never roosted together. In the 1940's there were four sub-roosts. Redshanks roosted on Loretto Newfield, where they obtained worms at high tide. This roost has remained ever since. The shingle spit was used by several species, but it was not a reliable roost site, for it varied in size and position and

so held only about 100 birds. Morrison's Haven was a regular roost (on rocks), used by a total of about 300 birds, Oystercatchers, Redshanks and Turnstones. Dunlins and Ringed Plovers also roosted in small numbers along the shore, but most of the Dunlins, Knots, Bar-tailed Godwits and Curlews went to Aberlady Bay to join the birds that fed there.

When the shingle spit grew in the 1950's, larger numbers roosted there, but the situation remained fairly static until the construction of the lagoons and the filling in of Morrison's Haven. This deprived the Oystercatchers and Turnstones of their former roost, and the Oystercatchers moved onto the partially built lagoon walls, whereas the Redshanks dispersed along the sea-wall. When the lagoons were completed the waders took to roosting in the west lagoon; all except the Redshanks on Newfield, and even they came onto the lagoon if they were disturbed from their preferred site. On rare occasions the roosting birds were forced to leave the lagoon roost, and when this occurred they would go to the sites they had used before the construction of the lagoons.

After 1966 there was a gradual increase in the number of people visiting the lagoons for recreation. This increased the disturbance, and the Oystercatchers and Redshanks that roosted in the west lagoon used the newly formed ash surface in the east lagoon with increasing frequency. By the end of 1971 the east lagoon had been filled and had overflowed into the east-central lagoon. The Oystercatchers immediately moved into this lagoon to roost on the newly formed surface. Thus the major roost changes have been :

1959 Oystercatchers, Redshanks and Turnstones moved from Morrison's Haven to the shore.

1964 Oystercatchers moved from the shore to the lagoon walls.

1966 All species except Redshank moved into the west lagoon.

1968 Oystercatchers and Redshanks moved from the west to the east lagoon.

1972 Oystercatchers and Redshanks moved from the east to the east-central lagoon.

The extent to which species use roosts other than the lagoons was examined by summing the low-tide counts for each section and comparing this feeding population with the high-tide count made in the west and east lagoons on the same day (table 3). On the four count dates Golden Plovers roosted exclusively inland (although they do sometimes roost in the lagoons). An almost constant number of Redshanks roosted on Loretto Newfield (when undisturbed), but the proportion of the March total was very small, since about 1000 passage birds had moved into the area, and all of these roosted in the lagoons.

Some Turnstones and Ringed Plovers remained on the shore or sea-wall at high tide, and here again the proportion doing so was smaller when large numbers were present in March. Other differences are probably the result of errors in counting. Where the roost count exceeded the feeding total, the difference was taken to be zero, for no birds from the lagoon roost are thought to feed outside the eight sections.

Table 3. Percentage of feeding populations that roosted away from the lagoons

	January	March
Golden Plover	100	100
Redshank	56	5
Turnstone	33	10
Ringed Plover	12	8
All other species	0	0

Averaged from four counts

Roost quality

The most dramatic change in the roosting behaviour of the wader population occurred when the lagoons were built. The roost moved from shifting shingle and rocks to a large flat expanse of mud, sheltered on all sides by steep embankments. The Musselburgh population then increased from a pre-1966 constant winter level of about 800 birds to a post-1966 winter average of more than 7000, though the transition was gradual rather than immediate. Table 4 shows the increase observed in the numbers of each species by comparing the sum of the

Table 4. Effect of the distance of the former roost site from the feeding area on the numbers of each species

	Bird-months per year		increase (× times)	former roost sites
	1959-61	1969-72		
Golden Plover	15	770	60	Inland
Bar-tailed Godwit	70	2160	30	Aberlady
Knot	480	7340	15	Aberlady
Curlew	140	1350	10	Aberlady
Dunlin	1190	10990	9	Aberlady
Oystercatcher	1340	11790	9	Local
Ringed Plover	130	610	5	Local
Redshank	1010	3890	4	Local
Grey Plover	5	15	3	Local
Turnstone	380	1160	3	Local

Note The unit used is bird-months per year. This measures the amount each species uses the roost by summing the 12 monthly averages for each species.

average number of each species present in each month of the year for the years 1959-61 and 1969-72. Data for 1972/73 are

excluded, because they are influenced by the reclamation at Seafield. The table shows that the species that used to roost at a greater distance from the feeding areas increased more than those that roosted nearby. The latter also increased considerably, presumably because they gained a more secure roost site. The species that had previously flown to Aberlady to roost now saved themselves a 20-mile return flight between feeding periods, and this is reflected by the large increase in numbers that occurred. Before 1966, Golden Plovers were rarely found on the shore at high tide, because they are very sensitive to human disturbance and so were forced to roost inland. Large numbers took to roosting in the lagoons when these were constructed, but as human disturbance there increased each winter so the number of Golden Plover declined. In 1972/73, however, the lagoons were frequently undisturbed, and large numbers of Golden Plovers were again at the roost.

Two other changes in roost site took place, involving Oystercatchers and Redshanks. With the increasing pressure of human disturbance these species took to roosting in the east lagoon and later in the east-central lagoon when a solid surface formed there. There, only 400 yards from their original lagoon roost, they avoided most of the disturbance to which they had been subjected previously. This was followed by an increase in the average winter numbers from around 1000 in 1969/70 to around 3000 in 1971/72. No such increase was recorded elsewhere in the Forth (BTO Estuaries Enquiry unpublished counts).

Because over 90% of the Musselburgh population of Bar-tailed Godwits fed at Seafield, this species was greatly affected by the reclamation that took place from 1971 and which has now completely obliterated their former feeding area (section B). The shore at Seafield was used as a dump for demolition refuse in 1971 and, although it did not then encroach on the intertidal feeding area of the Godwits it stopped people from using the shore for recreation, allowing the birds to feed undisturbed. As a result their numbers were about 50% higher in 1971/72 than in previous winters (800 birds compared to 500 in previous winters). However by 1972/73 the area had been walled in and the Godwits were unable to feed there.

Conclusions

It seems therefore that, at least for the past 14 years, the numbers of waders wintering in the Musselburgh area has been considerably influenced by the amount of disturbance to which the birds have been subjected, and by the quality of the roost site, i.e. its proximity to the feeding area and the extent to which it protects the birds from disturbance.

Acknowledgments

I am most grateful to J. Ballantyne for allowing me to use his notes and for considerable help in this study. I would also like to thank Dr L. L. J. Vick and D. I. M. Wallace for allowing me to use their notes, and Dr P. R. Evans for constructive criticism of the first draft of this paper.

Summary

Comparison of counts made of waders in the Musselburgh area in 1969-73 with others made in 1959-61 shows a considerable increase in the winter population of all species. Examination of the past and present roost sites suggests that it is mainly the quality of these that has determined the numbers of waders inhabiting the area. Cases of change of roost site are examined, and their effect on numbers is shown. The feeding distribution of the waders is examined in relation to coastal development.

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Roost selection by waders

R. W. FURNESS

The history of the wader population between Leith Docks and Cockenzie Power Station on the Forth estuary has been extensively documented (Gray 1875, 1877, Hamilton 1929, 1934, 1939, Loretto School Bird Club 1955 and Furness, this issue). Along with changes in roost sites there have been considerable changes in the numbers of each wader species using the area during the winter. It seems that the numbers are determined by the 'quality' of the roost. (Furness, this issue), and this paper discusses the effect of disturbance, the most conspicuous variable of roost quality. The roost complex at Musselburgh was visited on 50 occasions between 1969 and 1972 to record the numbers and distribution of roosting waders and the factors thought to affect them. Seven periods totalling 25 hours were spent in the winter of 1970/71 recording the incidence of disturbance at the high-tide roosts.

The roosts

The present Musselburgh roost complex is divided into several distinct sections. Each species shows a preference for a particular site (table 1), and it was to determine the reasons for that selection that this study was undertaken.

Roost 1 is at the edge of the water in the west ash lagoon. The level of the water in this lagoon is higher during spring tides, but as the lagoon wall is only slightly permeable the water level does not fluctuate much over a tidal cycle so that firm ground is always exposed. However during spring tides there is an inflow of water, and the roosting waders are crowded into a small area at the edge of the lagoon, close to human interference.

Roost 2 is also in an ash lagoon, but here the water level remains nearly constant. The substrate is powdered ash, which is pumped in suspension into the lagoon, so that the ash-water boundary is slowly shifting towards the west. The ash that has settled forms a hard surface, but the waders only roost on the wet ash, which is too soft to support a man's weight.

Roost 3 is on the playing fields of Loretto School. It comprises a large open area of grass adjacent to the shore. During mild weather it offers feeding at high tide for worm-eating species.

Roost 4 is on ploughed and grass fields inland where there is usually no disturbance, and feeding may be possible, but it is only used when the preferred roost is unavailable.

Roost 5 is the roost complex of Aberlady Bay. This is the primary roost of the Aberlady feeding population; the Musselburgh birds go there only when their preferred roost is not available.

Table 1. Roost site preferences of Musselburgh waders

	Roost Site					
	1	2	3	4	5	6
Oystercatcher	1	2		3		
Ringed Plover	1					2
Golden Plover	2			1		
Turnstone	1					2
Curlew	1				2	
Bar-tailed Godwit	1				2	
Redshank	1	2	1	3		
Knot	1				2	
Dunlin	1				2	

1 Most frequently used roost

2 Used when 1 is unavailable

3 Used when 1 and 2 are unavailable

Factors controlling roost-site selection

The best roost is the one that demands the smallest output of energy between the time the birds stop feeding and the time they can begin again, when the tide drops. Energy is expended in flying from feeding area to roost and in flying around the roost when disturbed, and so it is to be expected that the birds would choose the site where these two factors are minimal.

Disturbance factors and their fluctuation

Because most species prefer to roost in the west lagoon, almost all the disturbance observations were made there. Factors seen to disturb the roosting waders were : Carrion Crow (44 times), people (24 times), aircraft, Kestrel, sand-yachts and dogs (twice each), and shooting, gulls, and thunder (once each). All of these, except people and Carrion Crows, were rare and probably occurred only on odd occasions throughout the winter. However there were marked variations in the numbers and behaviour of the two common disturbance factors, people and crows.

Table 2. Monthly average number of Carrion Crows at the roosts

	Month											
	6	7	8	9	10	11	12	1	2	3	4	5
Roost 1	0	0	0	1	1	2	3	4	3	3	0	0
Roost 2	0	0	0	2	4	3	3	2	2	4	1	0

Crows roost with the waders in the lagoons (table 2). The extent of human disturbance is difficult to assess. Children and birdwatchers cause much more disturbance than the more numerous fishermen and dog-walkers. Generally speaking there are many more people present at the week-end, especially on Sundays, and most of the visitors to the area come in the afternoon.

Results and analysis

During the observation periods all instances of disturbance of more than ten birds were recorded : the disturbing factor was noted, together with the number and species of birds put up, the average time they spent in flight, the estimated height to which they rose and the total number of birds of this species present at the roost. From these data the percentage of the population disturbed was calculated, and this value is used in the following discussion. Where comparisons are made, ranked data have been used in most cases.

Discussion

The different species at the roost react differently to the various disturbance factors : Dunlins flee from a passing crow which is ignored by Oystercatchers; low-flying aircraft terrify Bar-tailed Godwits and Curlews but are almost ignored by the other species. As well as showing this selectivity, each species reacts in a characteristic manner to a given factor. When a Kestrel passes over the roost the Ringed Plover scatter in all directions, flying fast and low over the ground, whereas Dunlins climb steeply in tight formation and circle the roost until the predator has moved on.

Whereas some species, such as Oystercatcher, Turnstone and Redshank are unaffected by any of the four major disturbance factors and others like Bar-tailed Godwit and Dunlin are very sensitive to several, most species are sensitive to only one or two of the factors.

Other parameters of disturbance also varied according to the species and factor involved. The estimated height to which a bird rises when disturbed is proportional to its size when the disturbing factor is a human or a crow; with aircraft and Kestrels, however, the height is determined more by the type of escape behaviour evoked. It may be that the former two factors elicit only a low-intensity escape response, resulting in the birds rising to a certain height and then dropping down again to the roost.

The average proportion of the flock disturbed, the average height to which the birds rise or the average time spent in flight can be used independently as a measure of the intensity of the disturbance, for when the three parameters are compared for each species they all give the same rank to each disturbance factor.

Table 3. Susceptibility of species to disturbance factors as measured at normal tides at roost 1

	*Susceptibility to			Kestrel	Total Susceptibility
	human	crow	aircraft		
Bar-tailed					
Godwit	110	50	35	—	195
Dunlin	30	90	—	30	150
Golden Plover	100	—	—	—	100
Knot	15	35	—	—	50
Curlew	30	—	15	—	45
Oystercatcher	20	—	—	—	20
Redshank	5	—	—	—	5
Turnstone	—	—	—	—	0

*the unit used is the sum of the percentages of the number of each species present in roost 1 put to flight per hour by each factor during the period of observation (a total of 25 hours).

These measurements (table 3) suggest that roost 1 is far from ideal for Bar-tailed Godwit, Dunlin and Golden Plover, the three species that suffer most from disturbance from humans and crows, which they can avoid by going elsewhere. Golden Plovers usually roost inland where they can avoid most human disturbance, but Bar-tailed Godwit and Dunlins use roost 1 unless they are forced to go elsewhere. Oystercatchers and Redshanks on the other hand use roost 2 extensively when the other species are content to remain at roost 1 and suffer a small amount of disturbance. Whether these species use roost 1 or roost 2 depends mainly on the disturbance level when they come to roost. At week-ends when there are usually

more people present, a larger proportion of the Oystercatchers and Redshanks use roost 2.

Such a pattern is not found in the other species, which remain faithful to roost 1 unless they are forced to go elsewhere, in which case they do not go to roost 2 but much further to roost 5 or to odd places along the sea-wall.

It also seems that some effect of flocking makes Oystercatchers and Redshanks more than other species increasingly susceptible to human interference as their flock densities increase. Roost 2 is almost free from human disturbance, even on Sundays, but the small numbers of Oystercatchers and Redshanks that remain at roost 1 are not significantly affected by disturbance factors, whereas large flocks are. This is supported by the observation that a larger proportion of the Oystercatchers and Redshanks use roost 2 when large numbers of these species are present.

Spring tides

During periods of spring tides the waders are driven to the edge of the lagoon by the rising water level. They form a compact roost close to the paths used by many people. Such conditions prevail for about three days each month. In these conditions disturbance is intensified not only because of the proximity of passing people but also because the denser the flocks the greater the effect individuals have on their neighbours.

The intensification of disturbance by crows during spring tides seems to be entirely the result of the increased density of the roosting waders; indeed there were fewer instances of disturbance by crows, since no food was available to them when the water reached its spring-tide level. However human disturbance was intensified more because the birds were forced closer to the source of disturbance.

Table 4. Rates of disturbance at different tidal periods

Factor	Species	Disturbance rate		Change in Rank
		Normal tide	Spring tide	
Crow	Dunlin	5.3	13.0	0
	Bar-tailed Godwit	2.8	5.5	0
	Knot	1.7	2.4	0
Human	Bar-tailed Godwit	6.3	42.4	0
	Curlew	1.7	30.9	-1.5
	Dunlin	1.7	28.0	-2.5
	Oystercatcher	1.1	32.0	+1
	Knot	0.6	23.6	-1
	Redshank	0.0	35.0	+4

Note Disturbance rate is measured as the percentage of the population in roost 1 put to flight per hour.

The intensification of disturbance by crows during spring tides was similar for each species susceptible to crows, but the increase of human disturbance during spring tides varied from species to species. In particular Redshank and Oystercatcher became relatively more susceptible (table 4).

On occasions, particularly during periods of spring tides, human disturbance is so intense that the waders are forced to go elsewhere to roost. When this occurs each species chooses its particular secondary site. To test these results, a visit was made to roost 1 on a disturbance-free day when all the waders were there. The birds were subjected to slowly intensifying disturbance, and their movements were recorded. First to leave the roost were Golden Plovers, which flew off inland when flushed for the first time. Later, groups of Oystercatchers and Redshanks moved off to roost 2 until fewer than 100 of either species remained. The other species withstood the disturbance for some time, flying about the roost, but eventually they also left. Ringed Plovers and Turnstones dispersed along the sea-wall, while Curlews, Godwits, Knots and Dunlins flew in loose flocks towards roost 5, several miles away at Aberlady. This confirmed that Golden Plover, Oystercatcher and Redshanks readily leave roost 1 to avoid disturbance, whereas the other species will endure it if possible. However, although it has been shown that these three species are highly susceptible to disturbance, this alone does not explain why they leave so readily. Bar-tailed Godwits, the most sensitive of all the waders, prefer to remain at roost 1 as long as possible. The other important consideration is the distance the birds must fly to reach their secondary roost. For Bar-tailed Godwits this amounts to 10 miles, compared to quarter of a mile for the Oystercatchers and Redshanks and two miles for the Golden Plovers. It seems probable that the Godwits would also leave roost 1 if they could use a nearby alternative roost, but that even severe and prolonged disturbance usually demands less energy than a 20-mile flight.

It seems strange, therefore, that Bar-tailed Godwits do not avoid disturbance by using roost 2 (as other sensitive species do), and it is more surprising that Curlews, Godwits, Knots and Dunlins should prefer to go to Aberlady rather than to roost 2 when they are forced to leave roost 1. No satisfactory explanation for this has been found. It may be connected with the feeding behaviour of these species at the roosts. A small proportion of the birds feed in the west lagoon and probably do so at the Aberlady roosts, but no food is available at roost 2. However it seems unlikely that the amount of food that might be taken at the roost would warrant a round flight of 20 miles.

Alternatively it may be that some feature of roost 2, such as the substrate composition, may be unsuitable for some species.

This has not been investigated. It may be more than a coincidence that the roosts used when roost 1 is unavailable are situated where these species used to roost in the years before the lagoons were built. Thus the Godwits, Dunlins and Knots may go to Aberlady by tradition. As they are only forced to do so at most on three occasions each month they may not yet have discovered roost 2, although occasionally a few individuals of these species do go there with flocks of Oystercatchers and Redshanks. However, they usually do not remain there, but return to roost 1 after a short time, which tends to suggest that in some respect roost 2 is not suitable for their roosting requirements.

At roost 1, when the Oystercatcher and Redshank flocks are very dense, the threshold for escape behaviour is reduced, apparently by the socially stimulating effect of flight-intention movements. When maximum density and disturbance level are reached the flock presumably breaks up, and at least part moves to an alternative roost. It seems that Oystercatcher and Redshank numbers at roost 1 are limited in this way, but the other species are probably well below the critical density, for they do not show such an increased susceptibility with increased density. Ringing data from the Musselburgh roost suggests that the winter population is sedentary; observations of movements between this and the adjacent feeding populations are few, and so it appears that the populations of Oystercatchers and Redshanks on this section of the Forth are limited by human disturbance at the roost.

Summary

Past records suggest that wader numbers in the Musselburgh area have been determined by roost quality; in particular by disturbance levels at the roosts. Disturbance factors are listed, and their relative intensities are compared. The susceptibility of each species to the various factors is examined, and the selection of roost site by each species is compared. Reasons are suggested for apparently anomalous choices of secondary roosts, and it is suggested that social facilitation to flight from disturbance in large roosting flocks of Oystercatchers and Redshanks limits the populations of these two species in this area.

Acknowledgments

I am most grateful to J. Ballantyne for helpful discussion and criticism of this study while it was being undertaken; to P. J. Mawby and the Nuffield Biology A-level Syllabus for stimulating my interest in this subject and to Dr P. R. Evans for constructive criticism of the first draft of this paper.

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R. W. Furness, Van Mildert College, University of Durham.

A Merlin roost in Wigtownshire

R. C. DICKSON

Introduction

In February 1970 a small communal winter roost of Merlins was found in Wigtownshire. Over 60 visits were made to this roost during the winters of 1970/71 and 1971/72 until April 1972. This paper gives notes on these observations.

Description of the roost

The Merlins roost at a coastal marsh/moor dominated by two extensive areas of sallows, forming thick growth. In all, the sallows cover an area of about 20-30 hectares. Surrounding them are extensive tracts of heather, bracken and grasses, with scattered clumps of whin and rhododendrons. In winter most of the ground below the trees remains waterlogged, and pools of water remain throughout the year. The area is ungrazed by domestic animals but is sometimes liable to human disturbance, especially by shooters.

The *Handbook* states that Merlins roost in plantations, though young or stunted trees are preferred, and also on or near the ground. Macintyre (1936) knew of a Merlins' roost in a plantation in Kintyre that was frequented for 40 years or more and on one occasion had counted eight Merlins in the same tree. In west Wigtownshire the Merlins roosted in sallows, usually at a height of 1-3 metres. Some trees and clumps were apparently more favoured than others, and at least three separate roosting stations were distinguished. On the ground below these roosting trees there were usually pellets and faeces, and at some the surrounding branches were whitewashed with droppings. In one isolated clump of sallows there were six different stations, but it is not known whether they were used by the same or different birds.

One Merlin was seen on three occasions going to roost about three kilometres away from the communal roost, once in sallows in April 1967 and twice in long heather in April 1969 and April 1972. On 5th February 1972 two Merlins were seen apparently going to roost in birch scrub about 29 kilometres east of this roost.

Numbers at the roost

In 1970/71 (fig. 1) the numbers gradually built up from 7th September to 8th November, and a very small peak was reached on 14th November; thereafter the numbers remained stable until a sudden decrease in December/January, and only one or two birds remained until the spring.

In 1971/72 a fairly similar pattern occurred, with the maximum in November again. There was a sudden decrease again in December, and only one or two birds remained until the spring. (Throughout the period of observation in both winters, only a single adult male was present, except on 13th November 1970, when there were two). Thus the numbers using the roost were remarkably stable and showed little or no change in composition until midwinter; thereafter there was a slight fluctuation until the roost was deserted in April.

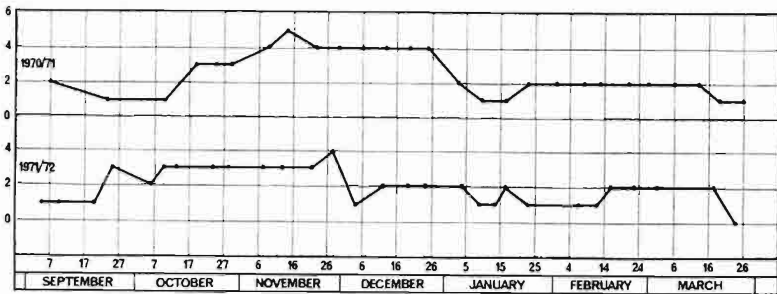


FIG. 1. Numbers of Merlins at west Wigtownshire roost,

Behaviour on arrival and departure

Arrival at the roost in the evening occurred before and after sunset. Table 1 shows the arrival times of the first and last birds during 1970/71; sometimes two birds arrived simultaneously. Their method of arrival varied: on some evenings the birds arrived low down, hugging the ground, but on other occasions they arrived at heights of 10-20 metres, dipping down on reaching the roost. On some evenings they quickly settled, especially late arrivals, but at other times they would land on branches of trees to preen or sit apparently idly. In the short winter days some arrived quite late, when it was nearly dark. On three occasions they were seen hunting the sallows where small passerines sometimes gathered to roost, and on one of these occasions a brown* bird was successful in capturing its (unidentified) prey.

In the mornings the birds usually rose and flew away at heights varying from ground level to 20 or 25 metres. Sometimes two birds left at the same time. Occasionally some would fly to a branch of a tree, sitting apparently idly before flying

*Female and immature birds in brown plumage are generally referred to here as brown birds; adult males refer to birds in "blue" plumage.

away. They were usually clear of the roost before sunrise, some birds, in fact, leaving quite early (see table 1). A late departure was 42 minutes after sunrise when it was raining. On five occasions Merlins were seen hunting at the roost in the mornings, once successfully.

An adult male and a brown bird were seen settling together in the same sallow on only one occasion, on 23rd February 1972. The male arrived first, and as the brown bird approached a whickering note was uttered. In Kintyre, Macintyre (1947) noted that "pairs" roosted together but birds of the year roosted singly.

There was hardly any apparent conflict over roosting stations, and only twice were Merlins seen to displace each other from sallow branches: on both occasions a brown bird displaced a brown bird. At other times, both morning and evening, the Merlins engaged in stupendous aerial chases. Two birds, usually an adult male and a brown bird, but sometimes three birds, would mount into the sky, keeping close together one behind the other, the brown bird usually leading. Diving down, they would hurtle through the sallows and mount again, diving and swooping to enact the whole performance again. These chases were spectacular to watch. Sometimes in their breathtaking performances the Merlins would stall momentarily to touch talons; sometimes they would utter shrill, excited calls. Chases lasted from one or two minutes up to 27 minutes. They have been recorded in every month during the winter except January and March and in all types of weather. An extension of this behaviour was seen once, on 10th February 1970, when an adult male and a brown bird were seen soaring together, about 20 metres high, keeping close together, sometimes turning on their sides to touch talons. These aerial chases have also been seen on two occasions at a site about three kilometres away from the roost, in October and February. Macintyre (1936) noted that when two Merlins meet when hunting they "play" together. The following description of a typical chase is quoted in full from my notes :

25th September 1971

0610 hrs Arrived at roost; clear skies, frosty, cold, very light northwest breeze; sunrise 0709 hrs.

0642 hrs Heard shrill whickering calls and saw three Merlins (one adult male and two brown birds) chasing each other close together, through and above the sallows at a furious pace, swooping and diving; they moved southwest passing over two Carrion Crows on bush, the crows began to call. About 70 metres southwest of the roost the Merlins chased each other around a heather-covered sand dune, one mounting 20 metres or so in the air to dive down on the other two until all disappeared behind the contours.

Table 1. Times of arrival and departure of Merlins at Wigtownshire roost, 1970/71

Date	Evening Arrival		Morning Departure		Weather
	First Bird	Last Bird	First Bird	Last Bird	2) Evening 1) Morning
7.9.70	—11	+18			2) Cloudy
11.10.70				+14	1) Misty
19.10.70	—35	—30			2) Showery
25.10.70	—1	+24			2) Showery
26.10.70			—25	+5	1) Cloudy
29.10.70	—30	+13			2) Rain
7/8.11.70	—1	+10	+5	+42	2) Frosty
13/14/11.70	—2	+27	—16	—8	1) Rain 2) Broken cloud
21/22.11.70	+15	+18	—21		1) Clear skies 2) 1/8 cloud
28/29.11.70		+22	—19	+6	1) Clear skies 2) Drizzle
6.12.70	—27	+12	—42	—11	1) 1/8 cloud 2) Rain showers
12/13.12.70	—87		—52	—36	1) 4/8 cloud 2) Rain
20.12.70	—1	+26	—52	—43	1) Clear skies 2) Rain showers
25.12.70			—31	—20	1) Clear skies 2) 8/8 cloud
3.1.71	—33		—35	—9	1) Poor visibility 2) Cloudy
10.1.71	—25		—29		1) Cloudy 2) Clear skies
16.1.71	—29		—29		2) Some drizzle
23.1.71	+22		+7		1) Misty 2) Cloudy 4/8
31.1.71	+29		—40	—23	1) Heavy rain 2) Clear skies
7.2.71			—3	+5	1) 2/8 cloud 2) Cloudy
13.2.71	+5	+8			1) 8/8 cloud 2) Hail & snow
20/21.2.71	—34		—30	—8	2) Rain showers 1) Heavy rain
26/27.2.71	+24	+34	—13	—3	2) Misty 1) Misty
5/6.3.71	+12	+35	—13	—12	2) Cloudy 8/8 1) Cloudy 8/8
12/13.3.71	+13		—43	—17	2) Clear skies 1) Bright
20.3.71			—13		1) Light rain
26.3.71	+15		—10		2) 4/8 cloud 1) 8/8 cloud

Times are given in minutes before (—) or after (+) sunrise and sunset.

0655 hrs Two Merlins reappeared (an adult male and a brown bird); one landed on the top of a hawthorn bush, then it got up and dashed around the willows and disappeared.

0706 hrs Two Merlins reappeared, an adult male chasing a brown bird, uttering calls, diving and swooping at a tremendous pace; the male landed on a willow and the brown bird landed close by. Then they were up again, chasing, until the male landed on the same branch, while the brown bird circled around attempting to land, eventually knocking the male from the perch; the male settled a metre or so away.

0709 hrs. The male flew southwest with quick wing-beats, gaining height to about 20 or 30 metres, followed by the brown bird. The male turned and dived headlong at the brown bird, which turned over, and they touched talons. Swooping low they disappeared behind the contours and out of sight.

These chases may be significant, although they may be open to several possible interpretations. As Bannerman and Lodge (1956) point out, aerial displays by Merlins on breeding grounds must be uncommon. The chases at this winter roost may form or even maintain and strengthen pair bonds.

Relations with other species

Aerial conflicts (without physical contact) with Short-eared Owls and especially with Hen Harriers were seen at the Merlins' roost throughout the winter. Hen Harriers were frequently driven from the tops of the willows where they sometimes sat, and Hen Harriers sometimes moved Merlins from a perch. On three occasions two Merlins attacked a Hen Harrier, swooping without striking. Yet at other times both predators apparently ignored each other. Carrion Crows sometimes drove the Merlins from a perch, but I have also seen the reverse; the Crows also roosted in the willows. When the roost was first found in February 1970, a brown Merlin had approached me uttering a sharp chatter and circled immediately above me, swooping and diving until it flew away disappearing in willow thickets.

Acknowledgment

I would like to thank A. D. Watson for reading a draft of the paper and for his useful comments.

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A case of lamb-killing by Golden Eagles

D. N. WEIR

Introduction

In 1966 I briefly investigated lamb-killing by a nesting pair of Golden Eagles near Roybridge, Inverness-shire. The aims of this paper are to supplement the limited Scottish literature on the problem. Eagles are frequently said to kill lambs in Scotland, but investigation is often prevented by the birds or their nests being destroyed, and only two studies have been published (Lockie and Stephen, 1959 and Lockie, 1964). Elsewhere investigators have studied the problem on a much larger scale, in West Texas (Arnold, 1954, and Spofford, 1969) and for *A. audax* in Australia (Leopold & Wolfe, 1970). The Scottish situation has been recently reviewed from the literature by Newton (1972) who stated that the basic problem was more one of stock (i.e. sheep) management than of wildlife management.

Synopsis of events

On 23rd May 1966 it was reported to The Royal Society for the Protection of Birds that eagles had been killing lambs from the start of the lambing season (mid April). The RSPB was asked if damage could be reduced without destroying the eagles. On the 2nd, 9th and 11th June, prey remains at the nest and within 250 metres of it were examined, and on the 11th, after consultation with the Scottish Home and Health Department and the Nature Conservancy, the one live chick was removed from the nest, under licence, and a dead chick was also taken. There were no more complaints of lamb-killing, and the adult birds were not destroyed.

Prey remains

There were old remains of a small lamb and of an adult Red Grouse at a plucking place 20 metres from the nest. Nine recent items were found: two adult Red Grouse and a small chick, an adult Ptarmigan, an adult blue hare and four lambs (table 1). Lambs 1 and 2 were apparently killed by eagles. As lamb 3 was fresh, it had been taken live or recently dead. Lamb 4 was probably taken as carrion. The total weight of wild prey was estimated at 3.6 kg of which 2.4 kg remained. Depending on the completeness of the carcasses of lambs 3 and 4 when they were found or taken, the weight of lamb was estimated at 18-25 kg, of which 8-15 kg had been eaten. The proportion eaten of all prey ranged from 9 of 22 kg to 16 of 29 kg.

Eagle chicks

On 12th June the live chick was in good condition and feathering well, the absence of 'fault bars' (Hanmerstrom, 1967)

Table 1. Remains of four lambs at or near the nest

Lamb	Position	Date	Examined by	Estimated		State	Injuries
				Live Wt (kg)	Estimated Remains (kg)		
1	200m below nest	2 Jun	L. MacNally G. Addison	7	6+	Fresh, good condition, little eaten	bruising, bleeding at rib cage, neck and shoulders; one scapula broken
1		9 Jun	DNW	7	3	Fairly fresh, good condition, much eaten	as above
2	200m below nest	9 Jun	DNW	7	4	Fresh, good condition, part eaten	bruising, bleeding at shoulders; two scapulae and neck broken
3	on nest, missing 11 Jun	9 Jun	DNW	5-7	2	Fresh, most eaten	not apparent
4	on nest	11 Jun	DNW	5-7	3	Putrescent, most eaten	not apparent



PLATE 21. Musselburgh lagoons: an aerial view from the west, showing Cockenzie Power Station in the background.

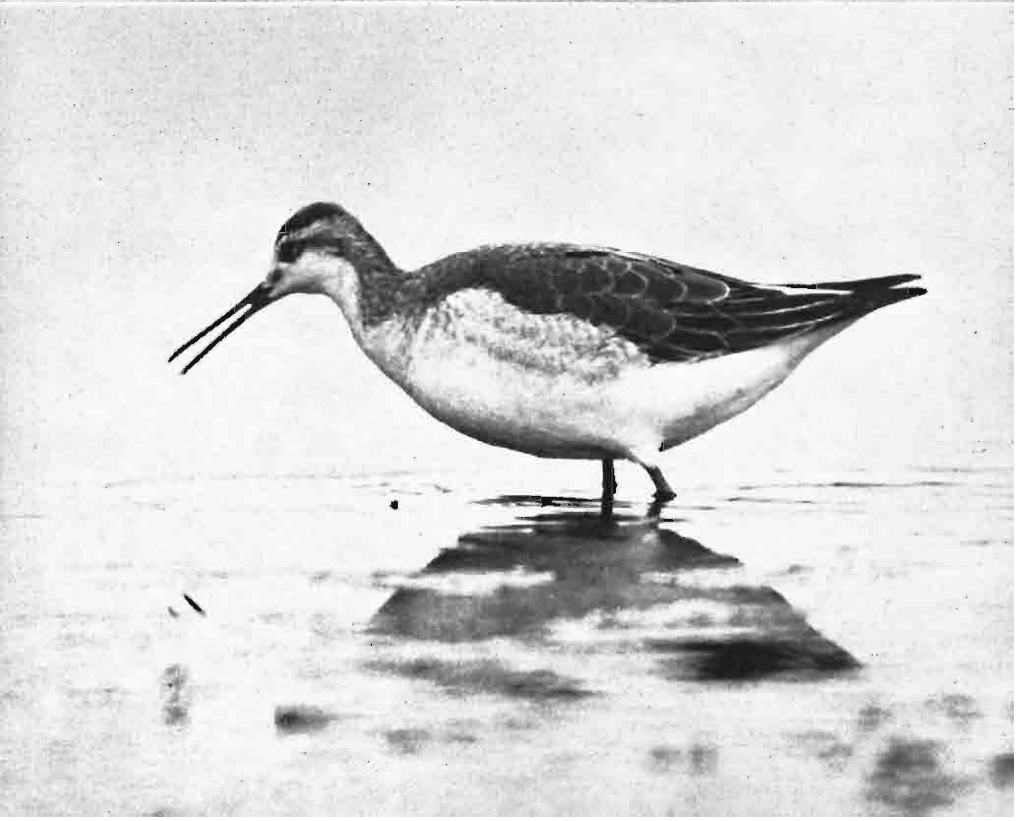
Photograph by courtesy of John Dewar Studios

PLATE 22 (over) (a) The west lagoon at Musselburgh with its exposed mud and shingle area.

(b) Oystercatchers, Bar-tailed Godwits and Knots take off in response to disturbance at the west lagoon.

Photographs by R. W. Furness





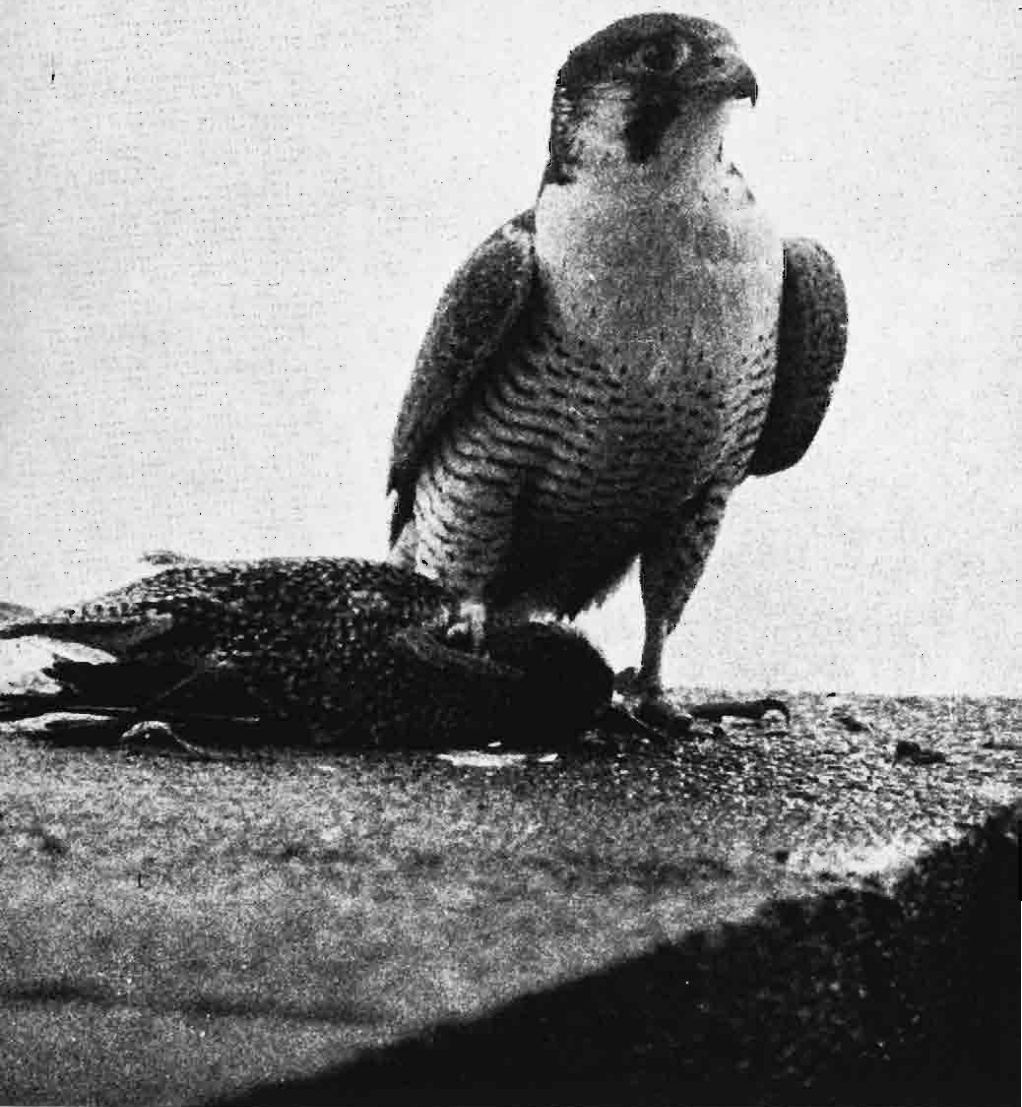


PLATE 23. (over) (a) Ross's Gull at Scalloway, Shetland, January 1972 (see p. 315).

Photograph by R. Johnson

(b) Wilson's Phalarope at Kirkgunzeon, Kirkcudbrightshire, August 1972 (see p. 315).

Photograph by R. T. Smith

PLATE 24. High-living Peregrine, with Redshank prey. Dundee, December 1972.

Photograph by Tom Smith; by courtesy of the Scottish Daily Express

indicating that it had been adequately fed. It weighed 3.7 kg on 2nd June, at an age estimated as about seven weeks. The decomposing dead chick had probably died in late May. It appeared thin, weighing 1.9 kg and had been battered about the head and neck, indicating sibling rivalry (Brown and Amadon, 1968).

Prey species and competitors

This section is based on information from R. J. Tapp, the owner of the 10000 hectare estate where the eagles nested, and from his stalker, G. Addison, as well as on my own experience of the surrounding area. The eagles were said to hunt mainly on the southwest part of the estate and on four adjoining farms, all carrying sheep at densities of about one ewe per six hectares, but with the sheep concentrated into the area hunted by the eagles, so that there were about 2500 ewes within their range. In the poor lambing season of 1966 these would have produced about 1000 live-born lambs (W. A. Sandison, pers. comm.) and subsequent deaths would have occurred. On 9th June, however, I found few carcasses or small or weakling lambs. One lamb, said to be of average size, weighed 12 kg on 12th June. About 80 red deer hinds were shot on the estate per annum, indicating a substantial calf crop. I saw no carcasses on 9th June. Brown hares and blue hares were said to be scarce, and rabbits to be absent. Red Grouse were said to be widespread but scarce, and Ptarmigan were known to occur, but no opinion of their status was given. I formed the impression that sheep carrion and live or carrion lambs were the most abundant food source.

Among competitors for live or carrion prey, foxes were common, with 11 killed on the estate in 1966 to the end of May. Wildcats were said to be absent. Peregrines and Ravens were both said to be absent, but one Peregrine summered nearby from 1968 or earlier, and I found a nest of the latter in 1966 within the eagles' range. Hooded Crows were common and were seen feeding on a lamb (lamb 1) thought to have been killed by an eagle. Fresh fox faeces 300 metres from the eagles' nest suggested this species also could have scavenged eagle kills (Weir, 1967).

Estimated damage

The nine items described were probably the total prey taken from to 11th June, although Watson (*in litt.*) suggested early consumption of small wild prey might have exaggerated the importance of lamb. The lower estimate (9 kg) of food eaten is close to the theoretical requirements (8 kg) of three eagles for 11 days (Brown and Watson, 1964). The maximum estimate (16 kg) would require the assumptions (a) that lambs

3 and 4 were complete when taken and (b) that there was no scavenging by other species. The first assumption is questionable and the second known to be false.

The start of lambing coincided closely with the estimated hatching date. In the following eight weeks I calculated, from Brown and Watson (1964), that the eagles would have eaten 800-1000 g of food per day, 45-67 kg of food altogether. R. J. Tapp estimated the mean weight of an average lamb over this period at 3.3 kg (pers. comm.). If the eagles had preyed on lambs throughout this period at the rate of 75-85% that occurred in early June, and if allowance is made for a 30% wastage rate (Brown and Watson, 1964), then 13-18 lambs could have been eaten over this period. By early June there were recent reports of unsuccessful attacks on large lambs (R. J. Tapp, pers. comm.), and those apparently killed (lambs 1 and 2) might have been of less than average size. Lockie (1964) considered live lambs were vulnerable for only a limited time, and at Roybridge predation might have fallen after about mid June. It may be speculated that the probable maximum number of lambs taken during the complete nesting cycle might be 20, i.e. about 2% of live births within the hunting range. Not all would have been alive—lamb 4 probably was not, and Lockie (1964) found that only three out of ten lambs at one nest had been taken live.

Discussion

The limited data given here agree with Lockie and Stephen (1959) and Lockie (1964) in suggesting that some lambs were taken dead and that the total number was a small percentage of those at risk. The problem is essentially a symptom of imperfect stock management, but the sheep farmer requesting help from a conservation body must find it difficult to accept such an argument and is likely to press for the prompt removal of the eagle chicks or the killing of adults. Newton (1972) implied this would be only a temporary palliative. Real benefit of such action would arise only when disproportionate concentration by eagles on one part of their range resulted in heavy losses to a single small farmer or crofter, but there is no evidence this has occurred in Scotland. Because it is possible that individual raptors may specialize in taking particular prey (Craighead and Craighead, 1956), this situation could, theoretically, arise, and removal of the individual eagle would then be justifiable.

Summary

A case of lamb-killing by nesting Golden Eagles near Roybridge, Inverness-shire, was investigated in 1966. Complaints ceased after the eagle chick was removed. Most or all food taken from 1st to 11th June was recorded: it consisted of three Red Grouse (including a small chick), one

Ptarmigan, one blue hare and four lambs, of which two, each about 7 kg, were apparently taken live. Lambs formed 75-85% of food by weight. If this proportion had been constant throughout the nesting cycle, it was speculatively estimated that up to 20 lambs might have been taken, or about 2% of those born in the hunting range. Some would have been taken as carrion, and some taken live may have been of less than average size. There appeared to be a shortage of wild prey. The data are discussed in relation to other studies of the same problem.

Acknowledgments

I am grateful to the landowner concerned, R. J. Tapp, and to his stalker, G. Addison, for their help. L. MacNally and several RSPB wardens helped in the field, as did M. Pawley and O. Ludlow of the Scottish Council for Physical Recreation, Glenmore Lodge. Dr I. Newton, N. Picozzi and Dr J. Cadbury discussed the paper in draft as did Lt. Col. W. A. Sandison. I especially thank Dr A. Watson for criticizing the manuscript. In 1966 I was in receipt of a grant for bird-of-prey studies from the RSPB. The views expressed in the discussion are, however, my own and not necessarily those of the Society.

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Breeding distribution of Grey Wagtails, Dippers and Common Sandpipers on the Midlothian Esk

C. N. L. COWPER

During the five breeding seasons 1962-66 inclusive, a group of SOC members in the Edinburgh area carried out a survey of the breeding distribution and numbers of Dippers, Grey Wagtails and Common Sandpipers on the River Esk, and in 1971 a further survey of a few selected sections was undertaken.

Table 1. Survey areas

Section	River		
1	Esk	River Esk below confluence of North Esk and South Esk	
2)		North Esk and tributaries up to Auchendinny	
3)	North Esk	Glencorse Burn and tributaries (includes Glencorse and Loganlea Reservoirs)	
4)			
5)			North Esk and tributaries above Auchendinny (includes North Esk Reservoir)
6)			South Esk and tributaries up to Trotter's Bridge
7)	South Esk	Gore Water and tributaries	
8)		Redside Burn/Fullarton Water/Portmore Loch (includes Edgelaw Reservoir)	
		South Esk and tributaries above Trotter's Bridge (includes Roseberry and Gladhouse Reservoirs)	

The North Esk rises in the Pentland Hills, as does its major tributary the Glencorse Burn. The North Esk is badly polluted below Penicuik (Lothians River Purification Board, 1963-67) although happily there is now some evidence of improvement. The South Esk and its major tributaries, the Gore Water and the Redside Burn/Fullarton Water, emanate from the Moorfoot Hills. The South Esk is considerably cleaner than the North Esk, being only mildly polluted downstream of Newtongrange. The total length of the river system and all its tributaries recorded on the one-inch-to-the-mile Ordnance Survey maps is approximately 250 miles. Early in the survey many of the minor tributaries were found to be unsuitable for the species concerned and were subsequently neglected. Some other stretches poorly covered in 1962 were omitted in later years, with little effect on the general results.

For the purposes of the survey the river system was arbitrarily divided into the sections detailed in table 1 and fig. 1.

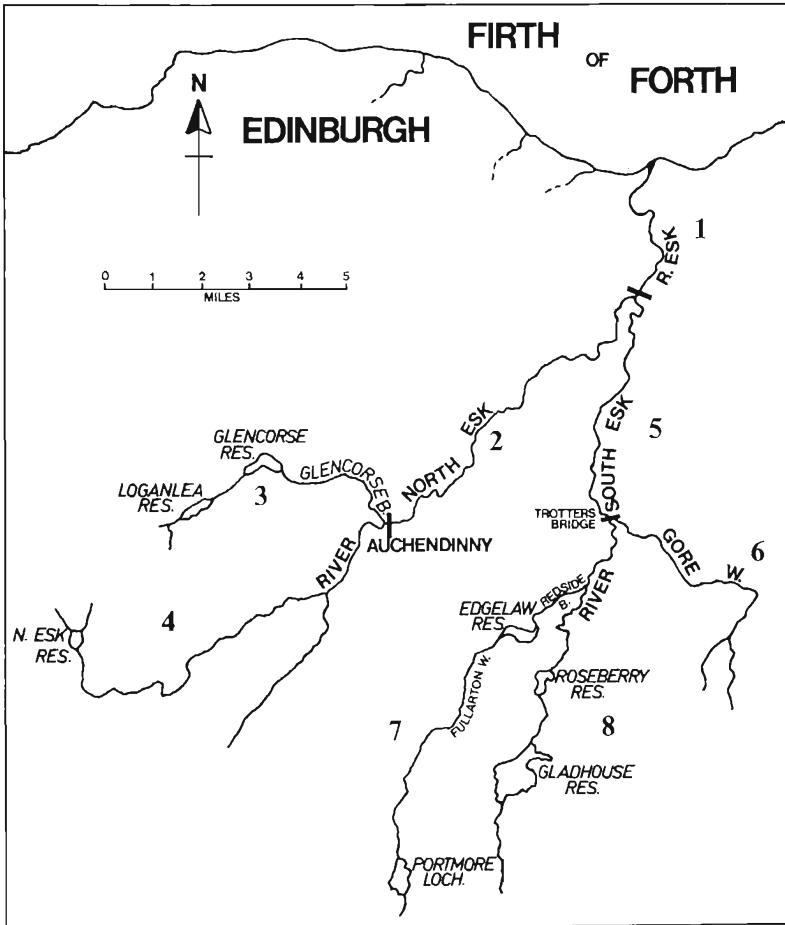


FIG. 1. The Midlothian Esk river system.

1. The River Esk below the confluence runs mainly through farmland to Musselburgh, where it enters the sea. Some of the banks are wooded. The only species recorded breeding here was Grey Wagtail.

2. From Auchendinny to the confluence, the North Esk passes through wooded valleys and the spectacular gorge of Roslin Glen; it then skirts Dalkeith before entering woodland.

3. The Glencorse Burn is the major tributary of the North Esk and contains fair numbers of breeding pairs of all three

species. Grey Wagtails and Dippers are found throughout the section. Most of the Common Sandpipers reside on the shores of the two reservoirs.

Table 2. Numbers of breeding pairs of Dippers, Midlothian Esk, 1934-71

Section	1934	1962	1963	1964	1965	1966	1971
1	—	0	0	0	0	0	—
2	—	1	0	4	0	0	—
3	7	6	4	4	3	4	4-5
4	—	15	12	18	13-14	9	—
5	—	2	2	2	4	6-7	—
6	—	1	2	4	6	9	—
7	—	1	3	2	4	5	—
8	—	5	4	16	18	22	—
	54*	31	27	50	48-49	55-56	sample only

*Only section 3 could be directly related to the work of Serle and Bryson. Of the 54 pairs, 28 were on the North Esk and 26 on the South Esk.

Table 3. Numbers of breeding pairs of Grey Wagtails, Midlothian Esk, 1962-71

Section	1962	1963	1964	1965	1966	1971
1	0	0	1	0	1	—
2	3	4	2	4	4	—
3	4	3	3	2	2	7
4	8	4	2	5	4	—
5	1	4	2	3-4	9	—
6	4	2	3	3	5	—
7	1	0	0	1	1	—
8	6	0	1	3	2	—
	27	17	14	21-22	28	sample only

Table 4. Numbers of breeding pairs of Common Sandpipers, Midlothian Esk, 1962-71

Section	1962	1963	1964	1965	1966	1971
1	0	0	0	0	0	—
2	1	0	1	0	0	—
3	8	6-7	11	10-12	12	11
4	8	8	13	12-14	12-13	—
5	0	0	0	0	0	—
6	0	0	1	2	2	—
7	6	8	6	7	9	—
8	18	20	20	16	15	—
	41	42-43	52	47-51	50-51	sample only

4. Hill burns feed the North Esk Reservoir, from which the River North Esk flows to wind its way through wooded valleys, including the formerly impressive woods of Penicuik Estate. The river passes the town of Penicuik and continues to Auchendinny. Smaller tributaries drain flat moorland.

5. From Trotter's Bridge the South Esk passes through

wooded valleys similar to those of the North Esk and on to the confluence with that river after passing through the town of Dalkeith.

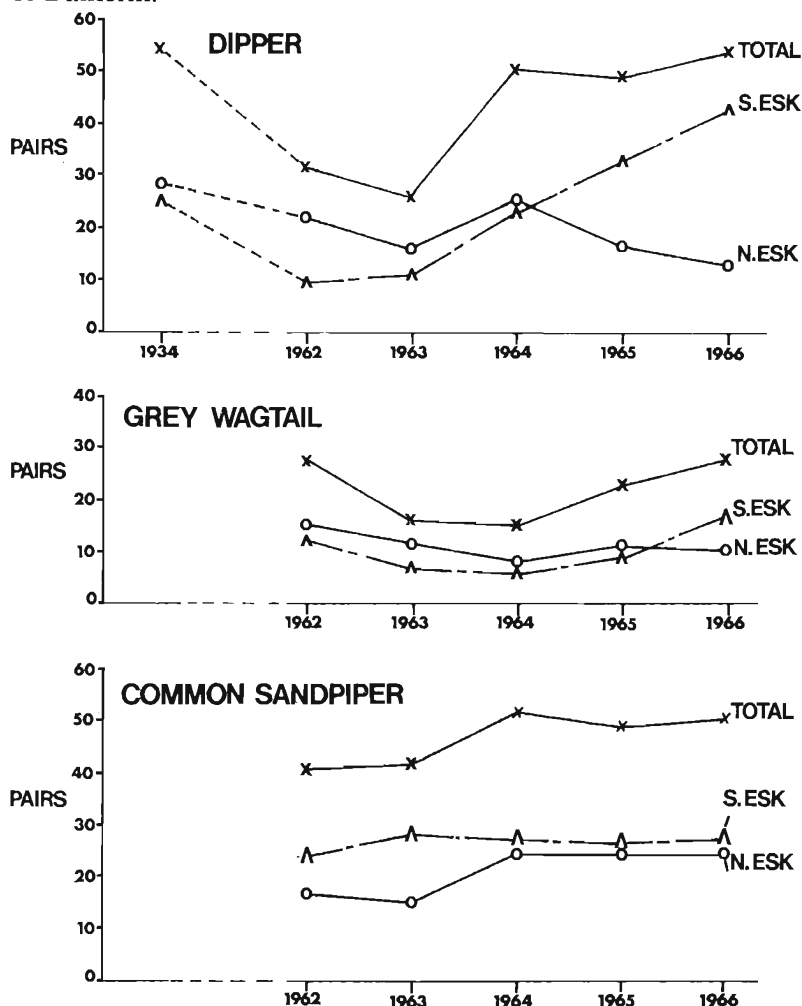


FIG. 2. Numbers of breeding pairs of Dippers, Grey Wagtails and Common Sandpipers, Midlothian Esk, 1934-66.

6. The Gore Water section is similar to much of the rest of the North and South Esk but on a smaller scale and without reservoirs. All three species breed here, but Common Sandpipers are not as abundant, owing to the lack of reservoir or loch shore.

7. The main part of the section from Portmore Loch down

to the South Esk consists of rather a slow flowing burn passing through flat moorland. Most of the Common Sandpipers are on the shores of Portmore Loch and Edgelaw Reservoir.

8. The South Esk rises above Gladhouse Reservoir. There and at Roseberry Reservoir are concentrated most of the breeding Common Sandpipers. Below Roseberry Reservoir the river is mainly bordered by woodland.

Some of these areas were further subdivided for comparison with the 1971 sample survey data. However, with the exception of the Glencorse Burn and its tributaries, the areas sampled in 1971 proved to be too small to provide significant results.

Results

Full results of the survey are recorded in tables 2, 3 and 4 and in fig. 2. A survey of Dippers on the Esk was carried out by Serle and Bryson in 1934. Where relevant, their results are included for comparison.

In general the breeding population of Dippers increased over the period of the survey, although numbers on the North Esk decreased. It is interesting that the totals recorded in the latter years are very close to the figure given by Serle and Bryson for 1934. The considerable fall in numbers of breeding pairs of Grey Wagtails in 1963 may be attributable to the severity of the preceding winter. By 1966 the breeding population had recovered to about the 1962 value. The 1971 sample count in section 3 showed a remarkable increase in population. The breeding population of Common Sandpipers remained relatively constant. Being a summer visitor, the species was unaffected by the severe winter of 1962/63.

Acknowledgments

The writer wishes to thank the following for their valued help in the execution of this survey. Apologies are made to anyone whose name may have been inadvertently omitted. D. G. Andrew, J. Ballantyne, W. Brotherston, A. Campbell, Dr A. C. Charleston, Miss J. Cochrane, H. Ford, D. R. Grant, J. E. King, J. Lindsay, I. H. J. Lyster, A. M. MacKenzie, A. W. Millar, N. C. Morgan, Mr and Mrs J. H. B. Munro, Mr and Mrs C. K. Mylne, A. D. K. Ramsay, P. J. B. Slater, R. W. J. Smith, J. A. Stewart, A. Tod, R. J. Turner, R. Walker, J. Young, L. M. Young.

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Short Notes

Possible interbreeding of Slavonian Grebe and Black-necked Grebe in Scotland

About 50 pairs of Slavonian Grebes breed in northern Scotland, and about 25 pairs of Black-necked Grebes breed in central Scotland. Occasionally, birds in breeding plumage occur in spring outside the regular areas. Recent research indicates that the Slavonian Grebe population in Scotland has decreased in the last decade, and as far as we know the species breeds now only in Caithness, Inverness-shire and Morayshire. Black-necked Grebes are more difficult to census, but the tiny Scottish population has apparently maintained its numbers in recent years.

This note describes a most interesting event that occurred in Scotland in 1972; it is a summary of information supplied by two observers who wish to remain anonymous for the safety and security of the birds.

In late May 1972 an adult Slavonian Grebe was seen with a group of Black-necked Grebes at a regular breeding site of the latter species. It was thought at first to be a migrant, but on 20th and 26th June it was found again on another loch in the area in company with four Black-necked Grebes. It was in full summer plumage, appeared to be holding territory and called frequently.

On 13th July the Slavonian Grebe was observed swimming with a chick on its back; soon an adult Black-necked Grebe swam up and fed the chick while it was on the Slavonian Grebe's back. Feeding was repeated several times, and on one occasion the Black-necked Grebe fed the Slavonian Grebe. Then the chick moved to the back of the Black-necked Grebe, and the Slavonian Grebe fed the chick. Change-overs were observed several more times, and both birds fed the chick. The three birds behaved as a family, and two pairs of Black-necked Grebes with chicks in the vicinity showed no interest in them.

Both observers watched the birds on 17th July. When they arrived at the loch the chick was on the Black-necked Grebe's back and was being fed by the Slavonian Grebe. The chick then left the adult and swam around for some time, being fed by both adults. The chick pursued the Slavonian Grebe on several occasions with the obvious intention of riding on its back. The Slavonian Grebe at first took evasive action but eventually allowed the chick onto its back, where it was fed by the Black-necked Grebe. It was noted that the feeding dives of the Slavonian Grebe were proportionately longer than those

of the Black-necked Grebe, and its frequency of feeding the chick was consequently about two-thirds that of the Black-necked Grebe.

At all times the two birds behaved as a pair, and the evidence strongly suggests interbreeding between the two species, but the birds were not observed during the mating stage, and one must bear in mind the possibility that the Slavonian Grebe adopted, or was adopted by, a Black-necked Grebe that had lost its mate during the incubation stage. Neither observer noticed any obvious differences between the chick and nearby Black-necked Grebe chicks.

I have been unable to find any previous records of this nature involving these two species, but attention is drawn to the presumed hybrid Great Northern Diver x Black-throated Diver in Wester Ross in 1971 (*Scot. Birds* 7: 89-91). The site is being watched in 1973 to see if either the Slavonian Grebe or the chick, if it is identifiable as a hybrid, returns to the site.

R. H. DENNIS *et al.*

Black-browed Albatross in Fife

During two and a half hours of sea-watching on 8th August 1972 about 4000 Gannets were seen to pass south off Fife Ness and into the Firth of Forth. An adult Black-browed Albatross was seen with them at 11.30, 11.38 and 11.55 a.m., down to a range of 500 yards; it was in view for a total of about six minutes.

The impression was of a huge shearwater-like bird, very long in the wing, with a fairly heavy body. Its wing-span was about a foot greater than that of the Gannets near it. The effortless flight consisted of occasional stiff flaps followed by prolonged gliding, with the bird tilting first one way and then the other to show clearly both upper and lower surfaces. The underwing pattern, white with a black border on both leading and trailing edges, and the large pale straw-coloured bill, characterised the bird.

Description Head, neck, breast and underbody pure white; a dark mark around the eye appeared broader at the front than at the rear; upper wing surface blackish; mantle not so black; rump and upper tail-coverts white, contrasting with small, black tail; underwing white, with black border on both leading and rear edges, the rear border seeming neat and sharp-edged, the leading border rather irregular in pattern and in some regions fairly broad; bill large, obvious, straw-yellow.

P. A. LASSEY.

(This record recalls the bird that summered on the Bass Rock in 1967 (*Scot. Birds* 5: 20), 1968 and 1969, and what was probably the same bird seen at Elie Ness, Fife, on 23rd August, 1969. This is the second record for South Fife.—ED.)

Honey Buzzard in Inverness-shire

At 11.30 a.m. on 7th August 1972, I saw a medium-sized raptor flying low over the ground near Loch na Faoileige, a mile west of Carn Macsna on the northern fringe of Balmacaan Forest, an extensive, rocky, mountainous area studded with numerous lochs and bogs.

The bird was flying in a southerly direction, about 200 yards from me and appeared more slightly built than a Buzzard. The tail was longer, and the head and neck protruded much further beyond the wings, which also seemed longer and narrower than those of Buzzard. The mode of flight was a series of powerful, deep wing beats interspersed with short glides on drooped wings. Against the high ground the bird looked rather grey, the upperparts and head being a uniform greyish brown and the underparts and head paler and heavily barred.

I had good views for about 30 seconds as it flew past, and at this stage it appeared a very different bird from a Buzzard in all respects, and I had no doubt that it was a Honey Buzzard, a bird with which I have become familiar in France and Spain. For a further minute I had poorer views while it was flying away from me, and then only the mode of flight distinguished it from a Buzzard.

However, after about a minute the bird started to soar in the sunshine and gradually drifted back towards me until it was overhead, 200-300 feet up. In soaring flight, the wings were held absolutely flat, never upwards, and the slighter build was still apparent, although not to the same extent as in direct flight. Overhead the general impression was of a heavily barred bird. The belly and breast were boldly barred, and the upper breast and throat were of a uniform dark colour. The underwings showed a series of bold unbroken lines close together, with a broad pale band along the hind wing. On the tail were three dark bands—one at the tip and two close together at the base.

The bird was overhead for about two minutes before it resumed direct flight towards the south, and was then watched until lost to sight.

M. I. HARVEY.

Peregrine wintering in Dundee

On 29th November 1972 the worried elderly resident of a flat on the 21st storey of a high-rise block in the centre of Dundee informed the *Scottish Daily Express* about a bird she had seen "... frequently, for several months, feeding on dead birds right outside my window".

The newspaper contacted me (as Keeper of Natural History at Dundee Museum) for enlightenment. The description given

by the lady, and the fact that she had witnessed a feral pigeon being killed, indicated that the bird was a Peregrine. Furthermore, T. M. Clegg had reported two sightings of a Peregrine within the city during the previous three weeks. Feathers of the prey species proved to be from feral pigeon, Redshank and Snipe. When I visited the lady, taking cabinet skins of various raptors, she unhesitatingly identified "her bird" as a Peregrine.

A photographer from the *Scottish Daily Express* started to visit the flat most mornings between 8.30 and 9.30 a.m., which was apparently the bird's feeding time. However, its arrival had become irregular, and we just missed it several times, although A. Rollo caught a glimpse of it flying off the balcony on one occasion. It was not until 14th December that the photographer's patience was rewarded, and the bird arrived at its feeding place with prey—a Redshank. He took six pictures before the Peregrine flew away, prey and all (plate 24).

The falcon obviously had no shortage of prey, since there are myriads of feral pigeons there. Collared Doves (remains of two were identified) are numerous in the city outskirts and by the docks, flocks of waders feed on the Dundee airstrip, and grouse are available in the Sidlaw Hills—only five minutes away as the Peregrine flies.

Perhaps we are seeing an adaptation of the birds' habits as the advent of high-rise blocks provides suitable feeding, roosting and even breeding sites.

A. B. RITCHIE.

Gyrfalcon in East Inverness-shire

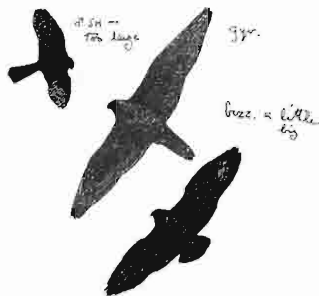
On 10th May 1972 N. Picozzi and I watched for raptors from points 400 metres apart near the foot of Loch Insh, Inverness-shire. Conditions were excellent for soaring, and we saw 16 birds of four species, including a Gyrfalcon. I watched the Gyrfalcon for more than ten minutes, in excellent light, at ranges of 500 to 1100 metres and pointed it out to NP by radio, when it was 800 metres from him. It moved southwest from near Kincaig, in alternating spells of level and circling flight, rising from about 15 to 100 metres above ground. It was harassed by a male Buzzard and a male Sparrowhawk. The description and drawing are taken from my field notes.

Description A very large falcon, much bigger than the attacking male Buzzard, about midway in size between female Buzzard and male Osprey; very long, broad wings; rather long, broad but pointed tail; long body. Wing action lanky, like Saker but not like Lanner or Peregrine. Frequent wing beats while circling, little soaring. General colouration brownish grey above (not pale on nape or crown), pale below.

NP confirmed it as a falcon much bigger than male Buzzard, with wing action unlike that of Peregrine.

Because of its extreme size, the absence of pale crown and

of any rufous colouring, I concluded it was a Gyrfalcon and not a Saker. As it was bigger than any of the 20 or so Gyrfalcons I had seen in Alaska and in Iceland, I thought it was a female. On Speyside, as elsewhere in Britain, most Gyrfalcon



records are of *F. r. 'candicans'* (Greenland Falcon), including the most recent local birds (*Scot. Birds* 4: 86). Extreme size and the colouration described, whilst corresponding more to *F. r. 'islandus'* (Iceland Falcon), are, however, also consistent with high-latitude Greenland or Canadian origin (Brown & Amadon, *Eagles, Hawks and Falcons of the World*). A 'very large, white falcon' was reported to me about a week later from near Laggan Bridge, 25 kilometres to the west.

D. N. WEIR.

Ruffs inland near Aberlady Bay, East Lothian

Ruffs have been seen inland near Aberlady Bay on farms along the Peffer Burn for many years. W. Murray noted two reeves in this area on 28th April 1956, five reeves and eight displaying Ruffs on 9th May 1957 and others in 1958. My additional observations since 1967 are summarised in table 1. There are inland records in every month except June, but I seldom looked especially for Ruffs, and the figures are not censuses. I saw Ruffs on most fields on these farms and on grass, young corn, stubbles and newly ploughed fields, at swampy places and puddles and also at pools dug to hold water for irrigation. They were also seen in relatively dry fields without standing water and following a plough, when they could easily be overlooked.

Some individuals seen from January to May and in early July were in various degrees of summer plumage, often with a white collar, but full or nearly full summer plumage was only seen in April/May and early July. When sexes were noted, there were usually more ruffs than reeves, and I did not record more than three reeves together inland (table 2).

Table 1. Maximum numbers of Ruffs seen each fortnight in fields east of Aberlady from January 1967 - August 1972

	Jan		Feb		Mar		Apr		May		June		July		Aug		Sept		Oct		Nov		Dec		
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	
1967			22	25	19	5	9										19				8	4	8+	5	
1968	15			12				3*													9		2	10	
1969	19	22		6	12		7															5		13	
1970			3	11	¶	13	12	7	1*	1*	1							1	19	16	12	19	12	7	18
1971	15	17		9	13	12	15	16						8**	3	4	6	3	2	12	5	2	15	2	2
1972	2	7		2	9	9x	4	4	2	2				2**	5	4	5	2	6	4	14	1		1	

*last seen : 1968, 21st April; 1970, ♂ 6th May, ♀ 31st May; 1971, 25th April (14 ♂♂); 1972, ♂ 6th May, ♀ 11th May

**first seen : 1971, 2 ♂♂ 10th July, 8 on 13th July; 1972, 1 ♂ 3rd July, 2 ♂♂ 4th July

¶ 19th March 1970—3 at Gosford Bay

x 18th March 1972—40-45 at Aberlady Bay; 25th March 1972, 20 at Aberlady Bay

Figures given in italics are for Aberlady Bay, where observations were mostly by G. L. Sandeman.

They often (but probably not daily) flew to and from Aberlady Bay. There they were seen especially at high tide in the bay south of Kilspindie House or on nearby fields. However, one of the largest flocks recorded there (34-40 in March 1970) was on the salt marsh. They frequently occurred in small

Table 2. Sexes of Ruffs seen at or near Aberlady, 1970-72

1970			1971			1972		
	♂	♀		♂	♀		♂	♀
April 22	1	0	April 10	10	0	April 30	2	0
			11	5	0			
			14		some			
			24	12	2			
				14	0			
May 6	1	0				May 6	2	0
31	0	1				11	0	1
			July 10	1	0	July 3	1	0
			14	2	0	4	2	0
			30	3	0			
			Aug 1	2	0	Aug 19	4	1
			7	4	0			
			25	2	0			
Sept 1	1	0	Sept 19	1	1			
Oct 3	16	0						
Nov 12	13	3	Nov 25	15	0			
			28	6	2			

groups inland, but did not behave as one flock. For example, on 23rd February 1970 we saw nine at Kilspindie and immediately afterwards two at West Fenton. On 24th February 1970 there were nine at West Fenton. Consequently it was difficult to tell how many there were altogether.

Similar numbers seen in autumn and spring 1969/70 and 1970/71 suggest that the same birds stayed throughout the winter. It was not till summer 1970 that I visited one favoured inland area, and lack of visits accounts for the absence of summer observations in previous years. One of the birds' favourite fields was drained in winter 1970/71, and in 1972 the summer and autumn were exceptionally dry. This may possibly account for the lower numbers both inland and on the coast in most of 1972. It seems likely that the wintering flock at Aberlady depends on the availability of suitable wet places inland.

DAVID JENKINS.

Wilson's Phalarope in Kirkcudbrightshire

On 25th August 1972 B. S. Turner and I found a phalarope on a pool of about one acre near Kirkgunzeon. When first located, the bird was feeding with Snipe and Teal in the centre of the pool. It was very tame and remained on the pool within ten yards of us. It fed while swimming and wading and would see a fly and swim or run towards it before catching it. On one

occasion it flew about a mile away then turned and came back to the pool. It also made several shorter flights. We did not hear it call.

It was a rather elongated wader, larger than a Snipe, and sat high in the water. It had a long neck and rather a small head. It swam in a deliberate way, jerking its head.

Description Crown and nape grey-brown, mantle, back and rump grey with a few scattered black feathers; upper wing grey, conspicuously emarginated, no wing-bar; underwing and axillaries white; upper and under tail-coverts and tail white, with an indistinct grey terminal band, a little broader in the centre; a whitish stripe above the eye extended down the neck and became less white as it merged with the breast; a dark eyestripe extended as a streak down the neck; throat, chin and underparts pure white, shading to a slight purplish tinge where the supercilliary joined the side of the neck, the same colour extending beneath the wings on the flanks; eye dark; bill black, long and very fine; legs pale orange-brown, noticeably thick, conspicuous on take-off but tucked away in flight.

During the next two days the bird was seen by a number of observers, and photographs were taken from a hide, at ranges down to eight feet (plate 23). All observers agreed that it was a Wilson's Phalarope moulting from adult to winter plumage. It stayed about the pool until 31st August and became less active: on the last day it stood in one place for two hours, then fed for an hour. It did not seem to be sick and flew strongly with a party of Snipe when disturbed by a Grey Heron.

E. C. FELLOWES.

(This is the fifth Scottish record and the first for Solway and Kirkcudbrightshire. The last record was in Angus in September 1970 (*Scot. Birds* 6: 333).—ED.)

Sabine's Gulls in Ayrshire and Fife

On 10th September 1972 at the north end of the sea-front at Largs, I saw an adult Sabine's Gull. It appeared from the south, flying steadily, by itself, along the shoreline at a height of 15-20 feet. The black primaries showed up so prominently that the bird was easy to pick out—as indeed it was later when in flight with 200-300 other gulls. It circled briefly and settled on the water for about ten minutes, not apparently feeding, then took off and fed from the surface after the manner of a Little Gull, dropping gently down from about ten feet to pick at the surface and then rising again. The flight was delicate, more graceful than that of nearby Black-headed Gulls.

About the size of a Black-headed Gull, the bird had three beautifully distinct triangular areas of colour on its upper wings; black outer primaries, white triangle of inner primaries

and secondaries behind, and grey forewing and coverts. At the nape a broad, diffuse area of grey-black extended nearly to the crown—which also had a few dark smudges—giving a rather dirty, untidy head pattern. The tail was slightly forked, pure white, and the bill was short and dark.

J. E. DALE.

On 8th October 1972 I saw a first-winter Sabine's Gull just off Fife Ness. It was with Black-headed Gulls and a single first-winter Kittiwake. My attention was first drawn to the bird by a tern-like call as it stooped over a party of gulls. It was smaller than Black-headed Gull, and at close range its tail, which had a broad black terminal band, was seen to be distinctly forked. Other distinctive features were the ash-grey crown and nape, the short, black bill and the wing pattern, with a triangular patch of pure white separating the black outer primaries from the brown-grey of the mantle. The underparts were pure white.

D. L. CLUGSTON.

Ross's Gull in Shetland

While we were watching a Little Gull off Scalloway on 22nd January 1972, 13 year-old Arthur Inkster noticed and identified an adult Ross's Gull. A small gull, with slight build and long, pointed wings, tapering body, short head and long tail, it was fractionally larger than the Little Gull and had the same dancing, tern-like flight. For about an hour it foraged rather like a Little Gull or Kittiwake, working its way from the voe to the harbour and flying back to start again. Frequently it landed on the water—but only briefly and very lightly, keeping its wings half open. It often came within three yards of us.

Description Head white, very rounded and dove-like; neck white, with pale grey smudges at sides, extending from the back; back light pearl grey; wings long, narrow, shaped more like Black-headed's than Little Gull's, upper surface as back, with prominent white trailing edge; primaries paler and unmarked, except for very narrow black leading edge to the first primary, visible only at close range when wing held raised; underside of wing rather dark grey (but not as dark as in Little Gull); rump white; tail white, long and pointed, with easily seen graduated feathering, appeared very wide as the bird banked; underparts pinkish; eye black, very large and round, with slight dark ring, giving a smudged effect; bill black, with reddish tinge at base, short, fairly stout and pointed (as in Kittiwake); legs very short, dark crimson, with webs slightly brighter.

Several other observers also saw the gull, and R. Johnson photographed it (plate 23).

N. L. STORIE.

(This is the third Scottish and Shetland record, the previous ones being in April 1936 and October 1969.—Ed.)

Nuthatches in Perthshire

About late May 1970 at Invergowrie in Perthshire, J. J. A. Cullen and I saw a Nuthatch fly to the trunk of a tree no more than 12 feet away from us. It had a slate-blue back and upper head, whitish chest, chestnut flanks and a short, poking bill. It remained for several minutes, clinging to the trunk and feeding in Treecreeper style, moving up and round the tree in short hops.

On 23rd January 1971, near the same place, P. L. Mellor and I had a brief view of a Nuthatch as it flew and landed on the trunk of a small bare tree five yards from us. It stayed for only a few seconds before flying into thick undergrowth and disappearing.

D. TURNER.

(These are the first substantiated records of this species in Scotland since 1966, when one was present in Kirkcudbrightshire in October and November (*Scot. Birds* 4: 450), and 1963/64, when one wintered in North Perthshire (*Scot. Birds* 3: 84). The spring record is the first since 1945, when one was seen on 21st April near Glasgow (Baxter and Rintoul, *Birds of Scotland*).—ED.)

Citrine Wagtail at Inverness

The Inverness branch of the SOC held a field outing on 3rd September 1972 and we visited some muddy pools between the sea-wall and the canal near Clachnaharry at 10.30 a.m. There were about a dozen Pied Wagtails feeding around the edge of the pools as well as some waders and gulls; about six wagtails flew over our heads to land in another pool, and I heard a quite different call from one of them, which I thought might be a Citrine Wagtail—a species I had seen at Fair Isle. After a little searching, I found the Citrine Wagtail walking and feeding in the short vegetation growing at the edge of the pool. It was moving about more than the Pied Wagtails nearby and going further away from the water's edge into the vegetation.

The bird was about 30-40 yards away, and we had it in view for about five minutes before it flew off, calling, with a small group of Pied Wagtails; it was not seen again. It was seen on the ground by about ten people, including Dr Maeve Rusk and Mrs M. K. MacDuff-Duncan who agreed with my identification and heard the distinctive call.

Description Upperparts as *alba* wagtail, darker than White Wagtail but not as dark as young Pied; two very clear white wing-bars formed by the white tips of the greater and median wing-coverts; clear white edges of tertial wing feathers; tail black with white outer feathers;

head grey as mantle or paler with white eyestripe behind eye; underparts wholly off-white without any band or dark mark across breast; sides of breast with grey wash; bill and legs black. Similar in size to nearby Pied Wagtails although possibly more pipit-like. The bird strode about more than the Pied Wagtails, with less bobbing and tail wagging. The call, heard in flight, was a short, rather harsh 'tseet', rather like a *flava* wagtail but shorter and harsher.

This appears to be the 16th British record and the first on the mainland of Scotland; there have been nine previous records at Fair Isle and one at the Isle of May in September 1968. Subsequently I heard that one was seen at Fair Isle 7th to 13th September 1972; all records refer to immature birds in autumn.

R. H. DENNIS.

Reviews

Birds of Moor and Mountain. By Donald Watson. Edinburgh and London, Scottish Academic Press, 1972. Pp. xvi+150; 25 colour and 15 black-and-white plates. 28 x 21½ cm. £5.50.

It is now almost ten years since Donald Watson's first major literary venture, when he provided the illustrations for *The Oxford Book of Birds*. This attracted a lot of favourable comment at the time, but although one admired the artist's ingenuity in packing a number of species onto the one page against a habitat background which maintained a high level of plausibility, one always felt that his instincts were for a broader canvas.

In this new book he is given the space to do himself justice. 25 of his paintings are reproduced in colour (the quality of the reproductions is excellent) and a further 15 in black-and-white. There are also a number of attractive line drawings to adorn the text. Donald Watson's paintings are well enough known to the readers of this journal, and his admirers will not be disappointed by this latest selection. His interest clearly lies as much in the bird's environment as in the bird itself, and the atmosphere of the Galloway moors comes over very convincingly in many of these paintings. They make one very ready to support the author in regretting the steady encroachment of forestry plantations over the hill ground, and one echoes the hope that some balance can be preserved between forest and moorland so that a very distinctive type of scenery is not lost completely.

In one respect only do I find these paintings disappointing as a series—not one of them shows the bird exulting in the full spring sunshine that can be as brilliant in Galloway as anywhere else. One neither expects nor wants paintings to reproduce the Kodachrome effect, but rather more variety in lighting conditions would have been welcome. And yet, looking at the paintings again, one feels that any complaint is churlish: so often they are outstandingly successful in capturing the character of the bird, and they carry the immediate conviction (as for instance in the painting of the Teal) that this is an actual event which has been faithfully remembered and recorded.

Inevitably one thinks of Donald Watson primarily as an artist, but the text of this book is every bit as distinguished as its illustrations. About 50 species are dealt with at length, and each of these is given two or three pages of comment, including quite a detailed plumage description, which might reasonably have been omitted in a book of this kind. Those who have been privileged to go goose hunting with Donald Watson will be

particularly pleased to find that there are full accounts of the three local species (Grey Lag, Whitefront and Bean). He has now been living in Gallo-way for over 20 years, and this book is a remarkable tribute to his activity during this period. Of particular interest is his study of the communal roosting of Hen Harriers, and this is well described along with an excellent account of the breeding behaviour of this splendid bird. Reading these accounts, one is repeatedly impressed by the breadth and depth of the author's knowledge of his subject, intrigued by the fresh ideas and suggestions he throws out, and delighted by the variety of his personal observations and the sensitive way in which these are expressed. The artist in Donald Watson is just as evident in his writings as it is in his paintings. Some of his personal observations date back to the pre-war years, and it is pleasant to be reminded of the occasion when Snow Buntings invaded the Murrayfield pitch during a rugby international, Alas, there have been no similar diversions in recent years!

Altogether, then, this is a most distinguished addition to the literature, and it is a matter of particular satisfaction to us that it should have been made during the author's reign as President of the Scottish Ornithologists' Club.

DOUGAL G. ANDREW.

Predatory birds in Britain. By the Avian Predators Working Party. London, Field Sports Society and Council for Nature, 1973. Pp. 64. Line drawings of each species. 35p.

This is an important attempt to summarize for the general reader an approach to the protection and control of predatory birds agreed by a variety of interests. Those represented were the British Falconers' Club, the British Field Sports Society, the Council for Nature, the Fauna Preservation Society, the Game Conservancy, the Gamekeepers' Association, the National Farmers' Union, the Royal Society for the Protection of Birds and the Salmon and Trout Association, with assessors from the Forestry Commission, the Home Office, the Ministry of Agriculture and the Nature Conservancy.

Lord Arbuthnot's foreword is perceptive and thoughtful, and the introduction outlines simply and well the population ecology of predatory birds and of their prey, though it states that all birds tend to increase to the limits of their food resources. This is unlikely to be true of the raptors, for their populations are often limited naturally at much lower levels than food supply would dictate. An excellent summary of the law relating to protection and control follows.

The main text treats 45 species (divers, cormorants, herons, sawbills, raptors, Moorhen, skuas, gulls, terns, owls, Kingfisher and crows), with individual illustrations, descriptions, notes on breeding distribution, food, 'need for control' and methods of control. Concluding general sections cover methods of control and prevention of damage without control. The last topic is still in an early experimental stage, but many readers may expect more information than they are given here.

About 25 of the 45 species (including three whose populations are of international importance) breed mainly or entirely in Scotland, where their legal or illegal control is intended to improve sport, very commonly for non-residents. Eventually, this potentially controversial situation may be affected by the trend towards local control of resource exploitation. However, not one of the non-government organisations who formed the working group appointed a Scottish resident as representative. This is a pity and was probably unwise.

DOUGLAS WEIR.

The Scottish Ornithologists' Club

ANNUAL CONFERENCE

The 26th Annual Conference and 37th Annual General Meeting will be held in the Hotel Dunblane Hydro, Perthshire, on 26th to 28th October 1973. Bookings should be made direct with the Hotels. The full programme will be posted to members in September and will also be published in the next issue of *Scottish Birds*. The registration fee will be 90p, and the Annual Dinner (with wine or soft drinks) £2.75 inclusive of service charge and V.A.T.

Hotels in Dunblane

Hotel Dunblane Hydro (tel. 0786 82 2551). Special Conference charge £10.23, inclusive of 10% service charge and V.A.T., bed and all meals (except tea on Saturday afternoon and the Annual Dinner) from Friday dinner to Sunday lunch, and after-meal coffee. For less than a full day, bed and breakfast is £3.63, lunch £1.10 and dinner £1.65; rooms with private bathroom have a daily supplementary charge of £1.10. All the above charges are inclusive of 10% service charge and V.A.T.

Ardleighton Hotel (near Hotel Dunblane Hydro gates) (tel. 2273). Bed and Breakfast from £1.50 - £1.75.

Stirling Arms Hotel (tel. 2156). Bed and Breakfast from £1.65 - £2.00.

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Allan Water Hotel (tel. 2293). Bed and Breakfast from £3.20 - £4.00.

Old Manor Hotel, Henderson Road (tel. 2169). B & B from £2.50.

Queen's Hotel, Henderson Road (tel. 3268). B & B from £2.05 - £2.50.

Royal Hotel (tel. 2284). Bed and Breakfast from £2.88.

Except for the Conference Hotel, prices are provisional and should be confirmed when booking; V.A.T. must be added to all prices except to those for the Hotel Dunblane Hydro.

BRANCH MEETINGS 1973/74

Will members please note that the dates of the first Meetings of Branches next winter will be as follows :

September	25th	Edinburgh
	26th	Ayr, St Andrews and Thurso
	27th	Dundee and Stirling
October	1st	Aberdeen and Glasgow
	2nd	Inverness
	3rd	Dumfries

Ayr Meetings will take place in the County Hall, County Buildings, Ayr at 7.30 p.m.

The venue and starting times of lectures at all other Branches will be the same as last winter.

AYR BRANCH WINTER EXCURSIONS 1973/74

1973

Saturday 6th October FAIRLIE FLATS. Leader: J. L. Burton. Meet Wellington Square, Ayr, 1.30 p.m. or Hunterston, 2.15 p.m.

Sunday 4th November CAERLAVEROCK and CARSETHORN. Leader: J. K. R. Melrose. Coach leaves Wellington Square, Ayr, 9 a.m. Book with the Ayr Branch Secretary (see below) by 15th October.

Saturday 1st December TURNBERRY POINT. Leader: R. H. Hogg. Meet Wellington Sq., Ayr, 10 a.m., or car park, Maidens Harbour, 10.30 a.m.

1974

Saturday 5th January IRVINE and BARASSIE. Leader: I. M. Darling. Meet

Wellington Square, Ayr, 10 a.m. or car park at mouth of River Irvine 10.30 a.m.

Saturday 2nd February DOONFOOT. Leader: W. R. Brackenridge. Meet at foot of Scaur o' Doon Road, 2 p.m.

Sunday 3rd March EAST LOTHIAN COAST. Leader: Dr M. E. Castle. Coach leaves Wellington Square, Ayr, 8.30 a.m. Book with the Ayr Branch Secretary by 14th February; bring picnic lunch.

For further details contact the Ayr Branch Secretary, R. M. Ramage, 57B St Quivox Road, Prestwick, Ayrshire KA9 1JF (tel. Prestwick 79192). Send s.a.e. if writing.

DUNDEE BRANCH WINTER EXCURSIONS 1973/74

1973

Sunday 30th September 1. ISLE OF MAY. Leader: P. N. J. Clark. Full details from the Branch Secretary (see below).

2. SHELL BAY and LARGO BAY. Leader: D. B. Thomson.

Sunday 21st October SIDLAW LOCHS. Leader: B. Pounder.

Sunday 18th November GLENMOY and FORFAR LOCH. Leader: I. Simpson.

Sunday 16th December LINTRATHEN and LOCH QUIECH. Leader: Dr D. G. Adamson.

1974

Sunday 20th January GLEN CLOVA. Leader: N. K. Atkinson.

Sunday 17th February PARKHILL, ARBROATH. Tay Ringing Group.

Sunday 24th March CAMERON LOCH and KILCONQUHAR LOCH (by kind permission of Elie Estates). Leader: Mrs J. A. R. Grant.

Sunday 21st April RED HEAD. Leader: B. Pounder. **Depart 9 a.m.**

All excursions leave City Square, Dundee at 10 a.m. (except 21st April). For further details contact the Dundee Branch Secretary, Mrs A. Noltie, 14 Menteith Street, Broughty Ferry, Dundee DD5 3EN (tel. 0382 75074). Send s.a.e. if writing.

WILDFOWL COUNTS IN SCOTLAND

A list of Regional Organisers responsible for the winter Wildfowl Counts in Scotland is printed in *Scot. Birds* facing 7: 104. Two Regions have a new Organiser:

Caithness S. Laybourne, Old Schoolhouse, Harpsdale, Halkirk, Caithness KW12 6UN.

Perthshire (East) E. D. Cameron, Strathclyde, 14 Union Road, Scone, Perth PH2 6RZ.

RAFFLE

The Club is to hold another raffle in aid of the *Scottish Birds* Appeal Fund. The first prize will be a week's holiday for two at the Fair Isle Bird Observatory. Tickets will be available through Branch Secretaries and the Club office from mid September, and the draw will take place after the Annual Dinner at Dunblane.

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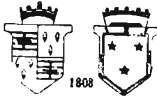
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