

Scottish Birds

Autumn 1999

THE JOURNAL OF
THE SCOTTISH
ORNITHOLOGISTS'
CLUB



Vol. 20 No. 1

ISSN 0036 9144

Scottish Birds

The Journal of the Scottish Ornithologists' Club

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Scottish Birds, the official journal of the Scottish Ornithologists' Club, publishes original material relating to ornithology in Scotland. Papers and notes should be sent to The Editor, *Scottish Birds*, 21 Regent Terrace, Edinburgh EH7 5BT.

Two issues of *Scottish Birds* are published each year, in June and in December. *Scottish Birds* is issued free to members of the Scottish Ornithologists' Club, who also receive the quarterly newsletter *Scottish Bird News*, the annual *Scottish Bird Report* and the annual *Raptor round up*. These are available to Institutions at a subscription rate (1997) of £36.

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Published by the Scottish Ornithologists' Club, 21 Regent Terrace, Edinburgh EH7 5BT

Printed by Meigle Print, Block 11, Units 1 & 2, Tweedbank Industrial Estate, Galashiels TD1 3RS

The breeding birds of Auskerry, Orkney, 1969-1998

R G ADAM & C J BOOTH

This paper documents changes that have taken place in the seabird population of Auskerry in the last 3 decades. In addition, other breeding birds are mentioned briefly.

Auskerry is a small island, approximately 1.5 x 1 km, situated on the eastern side of the Orkney archipelago, 5 km south of Stronsay. It has a rocky coastline with some boulder and shingle beaches. There are cliffs on the west side which reach a height of 18 metres and where Kittiwakes, Guillemots, Razorbills and the majority of Shags nest. The island has long been used for grazing sheep. The vegetation is mainly *Calluna* heath and acidic grassland with *Deschampsia* tussocks on both east and west coasts. It was designated an SSSI in 1997 and classified as a Special Protected Area (SPA) in June 1998.

Methods

Information on the breeding birds from 1969 to 1998 has been obtained from a variety of sources including the Seafarer counts in 1969 (Cramp, Bourne and Saunders 1974). A D K Ramsay made almost annual visits in the 1970s into the mid 1980s, staying for several days on each occasion. It is due to his enthusiasm for recording the birds of Auskerry that we have so much data for these years. Both authors have visited the island on a number of occasions throughout the study period and particularly from 1992 to 1998, when 3 to 4 day stays were made annually. Apart from 2 visits in May and one in June the majority of counts have taken place in July, which means that some breeding birds that

failed early will have been missed. For a number of species this means that the counts will be minima.

Breeding seabirds

Fulmar *Fulmarus glacialis*

A total of 150 apparently occupied nest sites was counted in 1969; then numbers ranged from 200 in 1971 to 121 in 1974 and 150 in 1980. Almost all of the inland nesting pairs that laid from 1974 to 1980 failed and the numbers at these sites dropped from 70 to 20 pairs. There was a large increase over the whole island in 1981 to 280 pairs and this level was maintained for several years. A decline has been noted in the last 5 years and a count in July 1997 found 110 apparently occupied sites on the west coast. There were very few inland nesting pairs in 1997 and 1998. It was thought that the number of nesting pairs in 1998 was very similar to the 1969 total.

Storm Petrel *Hydrobates pelagicus*

Before surveying methods had been established, it had been speculated that the breeding population was between 1,000 and 9,999 pairs. A survey in 1995 using a daylight playback technique found an estimated 3,613 occupied nesting sites (Wood 1996). No obvious changes have

been noticed during the study period but it is possible that sheep have collapsed some burrows.

Shag *Phalacrocorax aristotelis*

Twenty nests were counted in 1969; numbers then increased to a peak of 75 pairs in 1974 before gradually declining to 30 pairs in 1983. A further decline has occurred although numbers have remained fairly stable in the last 5 years with 21 nests in 1994, 20 in 1996, at least 16 in 1997 and 20 in 1998.

Arctic Skua *Stercorarius parasiticus*

Only one pair was recorded breeding in 1969 but 3 pairs were present in 1970 and 4, possibly 5, in 1973. Four pairs bred from 1974 to 1977, then 2 to 3 pairs were noted between 1978 and 1983. Two pairs were present in 1988 and from 1992 to 1998.

Great Skua *Catharacta skua*

Single pairs bred in 1969, 1970 and 1972. There were 2 pairs in 1973 and 1974 then only one pair annually to 1983. Single pairs have been on territory from 1992 to 1996, with a nest and eggs found in 1993. A pair was present in 1998 but there was no indication of breeding.

Common Gull *Larus canus*

Eighty pairs were counted in 1969 and during the 1970s numbers fluctuated, declining to 20 in 1973 then rising to 40 pairs in 1976. There was a peak count of 90 pairs in 1983. Numbers have since fallen to only 25 pairs in 1996; 50 birds were recorded in 1997 and 51 in 1998.

Lesser Black-backed Gull *Larus fuscus*

This gull has declined dramatically in the last 15 years and it now appears to be extinct as

a breeding species. One hundred pairs were found in 1969 increasing to 200 in 1973, numbers then fluctuated but gradually declined to 125 in 1983. In 1992 only 5 birds were counted; there were 2 pairs in 1993 but none have been found breeding since then. No birds were seen in 1998.

Herring Gull *Larus argentatus*

As with the previous species there has been a massive decline in recent years. From 450 pairs in 1969, numbers increased to a maximum of 900 pairs in 1976 then dropped to 600 pairs in 1983. In 1993 only 29 birds were counted, just 6 pairs in 1996 and 6 to 7 pairs in 1997. Nine nests were found in 1998 but breeding success appeared to be low.

Great Black-backed Gull *Larus marinus*

Following an increase in the early 1970s numbers declined for a time but have since apparently stabilised. Only 20 pairs were noted in 1969 but there had been an increase to 125 in 1973 and a peak of 180 pairs was reached in 1974. Control measures in 1976 led to a decline to 60 pairs by 1983. One hundred and twenty five birds were counted in 1993 and 95 birds in 1996. In 1998 there were colonies of 80 and 25 birds, also 2 pairs nesting on inland peat banks and 7 pairs along the west coast.

Kittiwake *Rissa tridactyla*

The 1969 count was 81 pairs; numbers fluctuated through the 1970s with 60 pairs in 1973, 27 in 1974, 42 in 1976 and 82 in 1980. There has been a gradual decline since then with 55 to 60 pairs in 1983, 28 nests found in 1996 and 27 in 1997. In 1998 only 18 nests were counted including 6 in one area, where the young appeared to have been predated by a nearby pair of Great Black-backed Gulls.

Sandwich Tern *Sterna sandvicensis*

Two pairs attempted to breed in 1973 but were unsuccessful. On recent visits birds have occasionally been seen flying over the island but there has been no evidence of any further attempts at breeding.

Arctic Tern *Sterna paradisaea*

Breeding numbers and group sizes have fluctuated widely during the study period. Only 160 pairs were noted in 1969 but there were 700 pairs in 1973, just 60 pairs in 1976 then a huge increase in 1980 when 4,000 pairs were recorded, the peak count. There were 800 pairs in 1983 and 4,200 birds in 1988. Recently numbers have remained fairly stable with between 1,000 and 1,500 birds annually from 1992 to 1996. Counts of individual birds including failed and nonbreeders were 2,060 in 1997 and 2,330 in 1998. Since the introduction of the North Ronaldsay breed of sheep 5 years ago there has been predation of those colonies on or close to the beaches. In 1998 a successful attempt was made to keep these sheep away during the breeding season from the main colony near the lighthouse.

Guillemot *Uria aalge*

This species appears to have increased during the study period, especially in the 1970s. Unfortunately visits in July are too late to give meaningful counts. Six individuals were noted in 1969, then in July 1976 280 birds were counted but many of these were thought to be non breeders. Over 100 birds were present in the main colony in 1985 and 190 on 15 June 1986. There were 109 birds, some with young, on 9 July 1998.

Razorbill *Alca torda*

As with Guillemot, July visits are too late for accurate counts of breeding numbers. In

1973, 6 sites and in 1976, 25 sites, were occupied. A count on 15 June 1986 found 70 birds and on 9 July 1998 26 birds on ledges, some with young.

Black Guillemot *Cepphus grylle*

Breeding pairs have declined since the mid 1970s but appear to have remained fairly stable during the last few years. Seventy four nests were found in 1976 but only 35 in 1983 and 37 in 1988. In 1993 and 1994, 26 nests were located, 28 in 1996 and 31 in both 1995 and 1997. Only 25 nests were recorded in 1998 but some other sites, usually occupied, had been flooded by run off from heavy rain.

There is a count of 205 birds around the island in April 1983 (Tasker & Reynolds). The Seafarer count was 342 individuals in 1969-70.

Puffin *Fratercula arctica*

The main colonies are along the west coast and in the north east of the island. Puffins increased in the 1970s and have remained fairly stable or even increased slightly since then. Further increases may be limited by lack of suitable breeding sites.

Thirty four birds were recorded in 1969, 90 in 1974 then an increase to 225 in 1976. Further counts are 175 to 225 in 1983, 200 in 1994 and 250 birds in 1997. There were 140 birds on land on 9 July 1998.

other species**Shelduck** *Tadorna tadorna*

A pair was present in May 1993 but breeding was not confirmed.

Mallard *Anas platyrhynchos*

One or 2 pairs bred, although not annually, in the 1970s. No recent breeding records.

Eider *Somateria mollissima*

About 20 pairs were recorded breeding in 1977. Numbers remain about the same.

Red-breasted Merganser *Mergus serrator*

A pair was present in 1985 and a nest with 10 eggs was found in 1986.

Oystercatcher *Haematopus ostralegus*

Four to 9 pairs bred annually in the 1970s and between 4 and 20 pairs in the 1990s.

Ringed Plover *Charadrius hiaticula*

Two pairs bred in the early 1970s, 6 in 1984 and 5 to 8 annually since 1994.

Lapwing *Vanellus vanellus*

A pair was present and probably bred in 1992.

Dunlin *Calidris alpina*

A single pair bred in 1974 and 1976.

Snipe *Gallinago gallinago*

Fifteen to 20 pairs bred annually in the 1970's. Numbers still about the same.

Curlew *Numenius arquata*

In 1993 one pair was present and a nest found. Single pairs were present in 1996 and 1997.

Turnstone *Arenaria interpres*

A single bird was displaying and defending territory in 1992.

Rock Dove *Columba livia*

Between 20 and 30 pairs bred annually in the 1970s. Only 25 birds were seen in 1998.

Skylark *Alauda arvensis*

At least 6 pairs were noted in the 1970s. Skylark have declined with none seen in 1998.

Meadow Pipit *Anthus pratensis*

Several pairs were recorded in the 1970s, at least 2 pairs in 1997 and 3 in 1998.

Rock Pipit *Anthus petrosus*

About 25 pairs were present in the 1970s. A minimum of 18 pairs was located in 1998.

Pied Wagtail *Motacilla alba yarrellii*

None were recorded in the 1970s. Two pairs bred in 1992 and 1993, single pairs in 1994 to 1998.

Wheatear *Oenanthe oenanthe*

Eight to 12 pairs were present in the 1970s, one pair in 1994, 3 in 1995, 2 in 1996, 1 in 1997 and 1998.

Hooded Crow *Corvus corone*

A single pair was seen in 1974. There were 2 pairs in 1992 and 1993; single pairs 1996 to 1998.

Raven *Corvus corax*

A single pair has nested on the west side in most years and is usually successful.

Starling *Sternus vulgaris*

At least 10 pairs bred in 1976. Flocks of 20 to 50 birds are seen annually.

Twite *Carduelis flavirostris*

Six to 10 pairs bred annually in the 1970s. None were seen in 1997 or 1998.

Discussion

Some of the changes detailed above are due in part to more intensive grazing with subsequent depletion of ground cover. Sheep disturb ground nesting birds and may eat eggs and young. Apart from Arctic Terns, the seabirds most affected have been Common, Lesser Black-backed and Herring Gulls, although sheep are probably not the

main reason for the dramatic decline in the last 2 species. Numbers of both these gulls have fallen at colonies elsewhere in Orkney during the last 10 years (*pers obs*) and decreases have also been recorded from other parts of Britain (Thompson, Brindley and Heubeck 1998).

The drop in Kittiwake numbers is in line with the decline that has occurred at some colonies throughout Orkney since at least 1975 (Lloyd, Tasker and Partridge 1991). While a decrease in Black Guillemots has been recorded on Auskerry from the mid 1970s, a decline at other Orkney colonies does not appear to have been noted until the late 1980s (Orkney Bird Reports 1988 to 1990).

Two of the species that have increased since 1969 are Great Black-backed Gull and Guillemot. The Great Black-backed Gull population, despite fluctuations, is now apparently fairly stable although decreases have been reported from some Orkney colonies since 1990 (Orkney Bird Reports 1990 to 1996). The increase in Guillemot numbers would seem to follow the trends at monitored colonies elsewhere in Orkney (Thompson, Brindley and Heubeck 1998).

Acknowledgements

We are very grateful to Simon and Teresa Brogan and their family, not only for additional information, but also for their help and

hospitality during our visits to Auskerry. Andrew Ramsay carried out nearly all the early survey work on which this paper is based. Our thanks to S da Prato and an anonymous referee for their comments on an earlier draft of this paper. We are also indebted to the boatmen who have transported us to and from Auskerry in a variety of conditions, particularly John Deerness, Harvey Groat and especially Smith Foubister.

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Revised manuscript accepted December 1998

The use, abuse and misuse of crow cage traps in Scotland: a report on behalf of the Scottish Raptor Study Groups and the RSPB

D DICK & A STRONACH

The use of crow cage traps was investigated across Scotland during March-July 1998. All known records of crow cage trap catches received by the RSPB between 1985-1997 from members of the public were collated. A wide range of rare and fully protected species had been accidentally but sometimes deliberately trapped in crow cage traps. Following these findings, a 5 month study into the use and legal status of a sample of 36 crow cage traps in Scotland was conducted. At least 78% of these crow cage traps were being operated illegally, with most failing to provide water, shelter and food. Although it is believed that most illegal crow trap use was not malicious and that many traps had been left carelessly set by operators, there is some historical and current evidence of crow trap abuse which is considered to be deliberate. The impact that crow cage traps have on protected species was investigated and it is concluded that crow cage traps pose a significant threat to a wide variety of protected species in Scotland. Changes to the law are urgently required and a number of recommendations are suggested that would reduce the threat crow cage traps pose to many protected species of birds.

Introduction

The crow cage trap is a widely used tool in the uplands of Scotland. It has a long history of use in this country and is recommended by game and agricultural advisors for multiple live trapping of Crows *Corvis spp*, Magpies *Pica pica*, Rooks *Corvus frugilegus* and Jackdaws *Corvus monedula* (Dick 1997). The legitimate use of these traps is covered by the catch all phrase 'cage trap' in section 5(5)(a) of the Wildlife and Countryside Act 1981.

There is no definition or description of 'cage trap' in any British or Scottish legislation. This lack of definition has led to a proliferation

of cage trap designs, and uncertainty over the terms of their use and maintenance by users and over the advice given by various agencies involved with enforcement of wildlife legislation (Dick 1997). There are 3 common types of crow trap: funnel, ladder and Larsen traps. All 3 types are widely used across Scotland but it is the first 2 which are the subject of this paper.

Operators of crow traps must comply with the conditions of the Protection of Animals (Scotland) Act (1912), the Abandonment of Animals Act (1960), the conditions of the Open General Licence (1997) and the Wildlife and Countryside Act (1981). These pieces of legislation require the responsible

person(s) to undertake certain tasks in relation to the use of traps and behaviour in relation to animal welfare by not causing unnecessary suffering. This includes inspecting crow traps daily when in use, unless there are problems with severe weather, and removing any birds caught at each inspection. Water and food must be provided in traps and it is likely that the provision of shelter in the harsh upland climate would also be required. All protected species must be released immediately.

Crow cage traps are generally used in open country for the purpose of catching non territorial crows outside the breeding season, and are visited by a wide variety of protected species of birds which are sometimes caught in them. The main aims of this paper are to detail the known cases of protected species caught in crow cage traps, investigate their general use and assess their potential impact on a range of species.

Methods

The first part of this study examines the records of known trapping of protected species in crow cage traps received by the RSPB between 1985-1997. A separate list is also provided which lists incidents of crow cage trap abuse which were considered to be deliberate. Incidents with evidence of alleged wrongdoing were reported to the police. From this appraisal, we considered that a more detailed study would help to determine the extent of the problem with such traps.

The second part of the study details the results of a 5 month investigation into the use and legal status of a sample of crow cage traps visited in spring and early summer 1998. Crow cage traps were visited across

Scotland at 26 estates and farms in Aberdeen, Angus, Banff, Dumfries, Inverness, Lanark, Lothian, Moray, Peebles, Perth, Roxburgh and Wigtown. Traps were selected by contacting local raptor workers and asking for details of all the known crow traps in their areas. From their responses these traps were then visited and checked and details of their size, structure and contents were recorded along with their legal status.

Results

The RSPB received 52 reports of incidents involving the trapping of protected species in cage crow traps in Scotland between 1985-1997. Reports came from a wide variety of sources including members of the public, estate workers, gamekeepers, shepherds, members of RSPB staff and the police. Reports were received from 16 Districts across Scotland from the Outer Hebrides to Borders.

Incidents of abuse of crow traps considered deliberate, 1985-1997

- 1 One Buzzard *Buteo buteo* killed by a keeper, March 1987, Renfrew hills.
- 2 Keeper told journalist that crow traps were being used to catch raptors for destruction including Hen Harrier *Circus cyaneus* and Golden Eagle *Aquila chrysaetos*, 1988, Dumfries.
- 3 One Golden Eagle November 1989 and 2 more 6 days later November 1989, Islay.
- 4 One live and one dead Buzzard and 3 dead (starved) Blackbirds *Turdus merula*, January 1990, Perth.

Table 1 *Reported records of crow cage trap catches received by RSPB between 1985-1997.* Abuse that was considered deliberate has been omitted. A few reports received concerned cage crow traps containing 'many' or 'several' of a particular species. For the purposes of this table 'many' and 'several' have been counted as 3, which is a minimum estimate.

Species	No of birds	No of traps	No of regions
Buzzard	73	17	9
Fieldfare	25	1	1
Kestrel	23	11	8
Golden Eagle	15	10	6
Sparrowhawk	13	3	3
Raven	13	4	3
Tawny Owl	9	1	1
Barn Owl	9	1	1
Blackbird	4	2	2
Unidentified finch	3	1	1
Unidentified owl	3	1	1
Short-eared Owl	2	2	2
Goshawk	2	1	1
Hen Harrier	1	1	1
Red Kite	1	1	1
Rough-legged Buzzard	1	1	1
Wheatear	1	1	1

- 5 One Goshawk *Accipiter gentilis* trapped live by keeper and illegally passed on to a bird of prey keeper, February 1992, Borders.
- 6 Two dead crows (starved), May 1995, Borders.
- 7 One live adult female Goshawk November 1995, Lanark.
- 8 Two Buzzards seized from a keeper who had removed them from a crow trap, put them in a sack and was returning to his vehicle, 1996, Inverness.

Crow cage trap survey 1998

The legal status of a sample of crow cage traps was investigated in 1998. 78% of the traps checked were being operated illegally (Table 2), with most failing to provide water, shelter and food (Table 3). Three of the crow cage traps that were used illegally also had no doors to facilitate the removal of non target species another illegally set trap had its door padlocked shut. Twelve crow cage traps were obviously not inspected daily because 8 contained dead, apparently starved Crows, one contained a dead Kestrel

Table 2 Legal status of a sample of crow cage traps visited in 1998.

Legal status	Number of crow cage traps	Percentage
Used legally*	6	17%
Used illegally	28	78%
Not in use, secured open	2	6%
Total	36	100%

*Used legally if they were checked every 24 hours.

Table 3 Criteria used for determining illegal use of the 28 crow cage traps.

Criteria	Number of crow cage traps	Percentage
No provision of water	18	64%
No provision of food	17	61%
No provision of shelter	17	61%
Not visited daily	12	43%

Falco tinnunculus, one a dead Sparrowhawk *Accipiter nisus*, along with a dead thrush *Turdus sp* and another contained a dead Merlin *Falco columbarius* which had been dead for some time. Two other traps contained a large number of Golden Eagle feathers, suggestive of a lengthy period of confinement with subsequent feather damage or destruction and removal of the trapped Golden Eagles.

Without watching traps for 24 hour periods it was not possible to know how many traps were checked daily, but it is likely that if the welfare of the trapped birds was not paramount, as was the case in the majority of traps visited, then regular daily trap checking would also be a low priority in many cases. In most instances there were no signs of footprints or tracks on wet ground which

would have been evident if crow traps were being closely checked daily.

The wire mesh sizes of each trap were recorded. Mesh size varied between 1 and 2 inch diameter, with 1.25 inches being the most commonly used mesh size.

The food/bait contents of each trap were recorded. Food was provided in 17 traps, which consisted of various lagomorphs in 15 (88%) traps, lambs/sheep in 3 (18%) traps, Pheasant *Phasianus cholchicus* in 3 (18%) traps and deer, grouse, duck, eggs and bread in one (6%) trap each. These bait items are main prey items for a number of raptors.

The live contents of each trap were recorded. Of the 34 traps in use, 9 (27%) contained live birds. Six contained Crows, one contained

a live Rook, one contained 2 live Mistle Thrushes *Turdus viscivorus* and 2 Starlings *Sturnus vulgaris* which were released and one contained a live Kestrel *Falco tinnunculus* which was released. A Long-eared Owl *Asio otus* was found next to a funnel trap with several owl feathers in and around the trap. The bird had a broken left wing and had to be destroyed by a vet. A *post mortem* revealed that the owl had been shot.

Discussion

We have been unable to locate a single item of published research on the design, use and effects of cage crow traps. This is remarkable considering their widespread use in Scotland and beyond. This paper therefore represents the first attempt to examine the effects of these traps on protected species. It is clear from the reports received and presented in this paper that crow cage traps are widely used across much of upland Scotland and that non target species are frequently trapped. A likely source of bias in the discovery and reporting of protected species by the public would be towards the finding of live birds in traps as opposed to dead ones. People would be attracted to the flapping of these live birds and it is quite possible that many more traps contained dead birds than were reported.

During this study at least 20 protected species of bird were recorded trapped in crow cage traps, as well as several non specific reports concerning thrushes and finches. The reasons why these birds enter cage traps were not always clear, but the great majority could be explained in terms of the food requirements of individuals. There also appears to be an element of mutual attraction between members of the same species,

particularly Kestrels, possibly reinforced by family ties.

The great majority of crow traps investigated in 1998 were being operated illegally across Scotland. Most crow traps investigated failed to provide water, food and shelter for their bait bird and potential victims.

There is evidence that some crow traps were set deliberately to catch and destroy raptors; however, it is believed that most illegal trap use was not malicious but that many traps were carelessly set by operators. *If a trap is not in use, then it must be rendered incapable of holding or catching birds* (Open General Licence Conditions 1997). Seventeen (61%) of the traps being used illegally were probably not deliberately set to catch birds ie those without bait inside. These traps frequently had no food, water or shelter but had been left with the door securely shut and the funnel/ladder entrance open. In only 2 cases were crow traps secured open and rendered incapable of holding or capturing birds. Empty traps left with their door shut pose a significant threat to several species and have been responsible historically for the capture, and sometimes subsequent death, of Golden Eagle, Kestrel, Buzzard, Rough-legged Buzzard *Buteo lagopus*, Sparrowhawk and Short-eared Owl *Asio flammeus*. In this survey 3 protected bird species died as a result of neglect of crow traps: these were Merlin, Sparrowhawk and Kestrel.

Although there were several examples of set traps being left unattended for extended periods, we believe that this is an under recorded and a widespread problem.

Crow cage traps are primarily targeted at Carrion/Hooded Crows *Corvus corone*

corone/C c cornix on the open hill, with statutory agencies recommending their targeted use in exposed positions well away from buildings (MAFF 1985 and ADAS 1987) such as prominent ridges or hill tops (FWAG 1988). However, there has been a disturbing increase in their use in woodlands particularly associated with Pheasant rearing, with traps found set with live bait in the form of pigeons or rabbits. There is evidence that these traps are specifically set for trapping raptors in a habitat that would not normally be associated with crows.

The widespread use of small mesh wire in crow traps increases the likelihood of trapping small birds and consequently some species of raptors, particularly Kestrel, Sparrowhawk and Merlin. The only people normally allowed to handle these wild birds are trained, licensed bird ringers. It seems an anomaly that untrained, unlicensed crow trap operators should be handling protected species. At present no one is yet calling for licensing of each trap, as is practised in other countries eg the Netherlands, but if crow cage trap abuse continues this may become unavoidable.

As most crow cage traps are used in areas remote or deliberately concealed from the general public the evidence presented in this paper represents the tip of the iceberg. There is a clear need for statutory agencies and crow cage trap operators to consider ways to reduce the capture of non target species, whilst still allowing legitimate crow control.

Potential impacts on a range of individuals and species

Golden Eagle is of particular concern because the attraction of carrion such as lagomorphs, sheep and deer in traps is

obvious; these items are a major food source for many eagles. It should be noted that eagles will also eat decoy crows.

Dick (1997) considered that dispersing young birds are the most likely victims. Wide dispersal of juveniles into areas without resident eagles is a recognised pattern of both the Scottish and tiny English populations. Young birds do not breed until they are at least 5 years old and they are therefore at risk for a considerable period in areas where their presence may not be expected by the local vermin controller. Their loss to the small UK breeding population may also prevent the possible expansion of this species into former haunts. A further concern is the trapping of adult eagles during their breeding cycle when both adults are necessary to successfully incubate eggs or feed growing chicks; even a 24 hour absence could be fatal.

Buzzard was the most commonly reported victim of trapping. One reason for this high level of reporting is undoubtedly that such a large bird flapping in a trap will attract the attention of any passer by. However, their preference for carrion is undoubtedly a major factor. Most worrying was the number of detailed reports received of Buzzards with feather damage due to prolonged attempts at escape. Any bird with less than 100% ability to fly and hunt, particularly in winter, has to be seriously at risk. Buzzards also featured in a number of crow trap abuse cases which were considered to be deliberate.

Kestrel Several reports were received of multiple trapping of this species. It is of interest that most reports concerned trapping during the summer months, after young have fledged. These birds do not normally eat

carrion. It is more likely that a bird is attracted by small birds or rodents feeding on insects and maggots produced by the carrion. Once the first bird is trapped, others may be attracted by its movements and calling and a mixture of curiosity and familial attraction draws them into the same trap (Dick 1997). Kestrels cannot survive for as long as Buzzards and Golden Eagles without food and shelter and are likely to die from hunger and exposure if they remain trapped for long periods of time.

Merlin This species does not normally eat carrion therefore Merlins are probably attracted by small birds feeding inside the trap. One adult male Merlin was found long dead inside a small mesh cage along with a live Kestrel.

Sparrowhawk As this species feeds exclusively on live birds, the reason for its appearance in traps is due to attempts to catch small birds already trapped inside. The fact that all of the traps investigated used small mesh chicken wire means that many traps can hold small birds and, therefore, attract Sparrowhawks, Merlins and Kestrels.

Goshawk There are a few reports of this scarce species entering cage traps to catch live prey. On at least 2 occasions it was believed that live prey (rabbits and pigeons) had been placed in the crow traps specifically to catch Goshawks which would then be killed.

Owls With several reports of trapped owls from members of the public it was not possible to identify individual species. However, confirmed reports of Tawny Owl, Short-eared Owl, Long-eared Owl and Barn Owl were received, with one report of repeat trapping

of Barn and Tawny Owls. The birds are undoubtedly attracted by live rodents, or possibly small birds, in the cage traps. As with Kestrels and Sparrowhawks, these owls are relatively small birds of prey with high energy requirements and therefore need a steady supply of small food items. Prolonged periods of confinement would soon be fatal for these birds. The deliberate shooting of a Long-eared Owl suggests that not all deaths were accidental.

Other bird species Although large crow cage traps can be constructed using wide mesh wire netting, all the crow traps examined during this study were constructed using fine mesh chicken wire and were therefore capable of trapping passerines. Once a small bird gains entry it is trapped as effectively as any crow. As mentioned previously, it is considered that these small birds are entering traps in order to feed on insects encouraged by bait carcasses. The reports of deaths of these birds should come as no surprise given their need for continuous feeding, water and cover at night (Dick 1997).

Recommendations

- ❖ Continued regulation and increased enforcement of crow cage trap legislation.
- ❖ A licence condition that police/ statutory agencies are given locations of crow cage traps other than Larsen traps on all estates.
- ❖ A strict code of conduct to cover licensed use of crow cage traps should be produced by the Scottish Executive.
- ❖ Ban the use of small scale chicken wire mesh in construction and ensure that all traps have doors to help facilitate the removal of non target species.
- ❖ Operators to record all non target trappings.

❖ Crow cage traps are designed for use on exposed positions in open hill country; their use in woodlands should be banned.

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Revised manuscript accepted December 1998



Crow cage trap

RSPB

The breeding status of the Spotted Crake in north east Scotland

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Breeding season records of Spotted Crakes in north east Scotland from 1989-98 are summarised, including the results of more intensive survey work during 1996-98. One to 5 calling males per year were recorded from 9 sites in total, almost all of which are extensive wet fens dominated by sedges Carex spp. This number of birds may represent 10-20% of the UK breeding population in some years.

Introduction

The Spotted Crake *Porzana porzana* is a rare breeding bird in Britain and Ireland (Stone *et al* 1997), though it is considerably commoner in central and eastern Europe, with 52,000-180,000 pairs in total (Tucker and Heath 1994). In Scotland, numbers have varied greatly from year to year, with more favoured areas historically being south west Scotland, Strathspey and Sutherland (Thom 1986). North east Scotland (Aberdeenshire and Aberdeen City) was not mentioned by Thom in connection with Spotted Crakes, Buckland *et al* (1990) note only 3 recent records (1977-88) and there was one breeding record mapped in the 1968-72 Atlas (Sharrock 1976). Since 1989, however, there have been many more records (NE Scotland Bird Reports 1989-97; RSPB and SNH unpublished information), with evidence of breeding on at least 2 occasions. In 1990, the Scottish Ornithologists' Club Grampian Branch organised a Nocturnal Survey (Bain 1991) which yielded much useful information on some less well recorded species (including Spotted Crake), particularly on lowland peat mosses and fens. The 1988-91 Atlas (Gibbons *et al* 1993) also recorded 4 x 10km squares with either breeding evidence or birds present. After 1991, however, there was no further

systematic attempt to locate the birds. This paper documents the increase in records of Spotted Crakes during the breeding season over the last 10 years and reports on more systematic survey effort in NE Scotland from 1996-98.

Methods

We collated all records of Spotted Crakes from 1989-95 using records held by the NE Scotland Bird Recorders and RSPB and SNH unpublished information. From 1996-98 we visited all sites known to have held birds in recent years, plus a number of others judged to have potentially suitable habitat. In total, 21 sites were visited during darkness, usually from 2330-0200, between mid May and mid June in calm and, if possible, warm weather conditions. At least half an hour was spent listening for the characteristic 'whip lash' call at all sites. At some sites thought to be potentially suitable, but where birds had never been previously recorded, tape recordings of calls were played. However, tape playing did not yield any additional success and birds were always detected calling on arrival at occupied sites.

Results

Eight sites were visited in 1996, 18 in 1997 and 20 in 1998; 8 were visited in all 3 years.

Table 1 Breeding season records of Spotted Crakes in NE Scotland, 1989-98.

Year	Details
1989	3 calling males at 3 sites during breeding season
1990	4 calling males at 3 sites; breeding probable (suspected pair with young; Bourne 1992)
1991	2 calling males at 2 sites
1992	4 calling males at 3 sites
1993	5 calling males at 3 sites
1994	5 calling males at 4 sites
1995	3 calling males at 2 sites
1996	5 calling males at 4 sites
1997	2 calling males at 2 sites; breeding proven (young birds seen) at another
1998	1 calling male at 1 site (poor summer weather hampered survey results)

The results from our survey are included in Table 1.

It should be noted that although the maximum number of sites at which birds called in any one year was 4, the total number of sites utilised by calling/breeding birds during 1989-1998 was 9, plus 2 more from which possible records were reported. Of these 9 sites, 8 are extensive fens or marshy wetlands with high summer water levels, dominated by extensive *Carex* beds or other very wet fen vegetation, sometimes with patchy *Phragmites* reed and always with scattered willows *Salix* spp. The remaining site is a marginal waterside fen. Three sites have been used by calling birds once only, the remainder being more favoured and used for 2 or more years in the last 10 with a maximum of 9, though one appears to have been deserted, with birds last recorded in 1992. Breeding was confirmed at one site in 1997 and suspected at another in 1990 (Bourne 1992).

Discussion

From 1973-85 there were up to 12 calling males at up to 6 sites in Britain (Batten *et al* 1990). During the 1988-91 Atlas period (Gibbons *et al* 1993), 17-21 calling males were recorded at 10-14 sites in Britain and Ireland. The most recent UK population estimate (Stone *et al* 1997), using data from 1989-92, is 1-20 pairs, though in Britain in 1993 there were 31 calling males at 19 localities, in 1994 11 males at 5 sites and in 1995, the most recent year for which information is available, there were 10 calling males at 8 localities (Ogilvie *et al* 1998). Clearly, the 1-5 calling birds per annum at up to 9 sites in total in NE Scotland are of considerable significance in both Scottish, British and UK terms – perhaps 10-20% of the recorded UK population in some years.

C J Mead (in Gibbons *et al* 1993) considered that because of the penetrating call and precise habitat requirements, it is most

unlikely that regular breeding sites are missed. This is not necessarily true in relatively under watched areas of Scotland. Certainly, an increase in the number of observers during the last 10 years might have contributed to the apparent increase in records in north east Scotland. However, it is interesting to note that even when a systematic effort was made to survey the birds in 1966-1998, we did not find more calling birds than in other years, and most records came from the same observers each year, rather than an increased number. The possibility remains that we under recorded the species on our visits, as some calling birds may have been missed. Apart from effects of bad weather and limited time spent at any one site, birds may be silent for part of the breeding season if pairing is successful (Cramp and Simmons 1979).

The method we used is similar to that adopted by the national Corncrake *Crex crex* survey (Green 1995; D W Gibbons *in litt* 1998 Corncrake Survey instructions). Corncrakes are known to sing most persistently between 2300 and 0200 hours GMT (0000 and 0300 BST), within which period males have been found to sing continuously during 70-80% of visits to home ranges. In the case of this species, the time spent singing at night varied little between late May and mid July (Green 1995). However, 2 visits are made for Corncrake survey work, which was not the case in our surveys. This also may imply that some Spotted Crakes were missed in NE Scotland. The RSPB, in conjunction with the statutory nature conservation agencies, will be coordinating a national census of Spotted Crakes in 1999. This will provide a better opportunity to assess the significance of NE Scotland in a year of enhanced fieldwork effort, standardised across the UK.

We conclude that there has been a genuine increase in the presence of Spotted Crake

during the breeding season in NE Scotland, with breeding proven or probable at least twice and likely, as deduced from the numbers and regularity of calling birds, at several sites during 1989-98. At least 9 sites are suitable for the species. The habitat occupied by the birds seems typical of that used elsewhere (Batten *et al* 1990; Tucker and Heath 1994), and there is no evidence of short term habitat change at any of them. Six of the sites are protected by SSSI status. However, long term vegetation succession will almost certainly lead to the drying out of some fens and SSSI status does not provide an easy solution to that potential problem. In addition, since most fens are not in agricultural use, measures such as the Scottish Countryside Premium Scheme are unlikely to be effective. Positive habitat management measures are needed, leading to the extension and rewetting of fens, and the creation of new wetlands liable to be colonised by wet fen vegetation, particularly *Carex* spp, in order to ensure that suitable habitat remains into the future. National and Local Biodiversity Action Plans may be the best way to achieve this, since fens are a UK priority habitat (Biodiversity Steering Group 1995). The requirements of Spotted Crakes should be built into this process.

Acknowledgements

We would like to thank Graham Rebecca and Ian Bainbridge for their comments on the manuscript, and Keith Morton and staff of Scottish Natural Heritage for information and comment.

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Revised manuscript accepted February 1999



Spotted Crake

Mike Ashley

Changes in the numbers and distribution of Mute Swans in the Lothians in spring from 1978 to 1998

A W BROWN & L M BROWN

Between 1978 and 1998 the number of Mute Swans in the Lothians in April increased by 318%. This change occurred during 2 distinct periods, 1978 to 1985 when there was no significant increase, and 1986 to 1998 when the population increased exponentially with substantial increases apparent amongst both non territorial birds and territorial pairs. Additionally, from 1986 the percentage of non territorial swans was consistently greater than the percentage of territorial swans, in contrast to the earlier years of the study. The majority of non territorial swans tended to collect in flocks on still waters or at estuaries. However, numbers did not increase in all flocks nor did increases occur simultaneously between flocks. Whilst the number of territorial pairs on canal, still water and river habitats increased the number on rivers decreased as a percentage of the Lothians territorial population.

Introduction

This study commenced as a result of concerns expressed by local ornithologists regarding the number of Mute Swans *Cygnus olor* in the Lothians. The consensus was that numbers had declined substantially but there were too few data to substantiate the impression that the population had decreased during the 1970s. An annual census of the spring population was instigated to monitor trends. Changes which occurred in the structure of the Lothians population in spring during the past 20 years are presented in this paper, during which time the total population increased from 116 swans in 1978 to 485 in 1998. Since the total population comprised non territorial and territorial swans the changes in each were dealt with separately in order to investigate the processes by which such a dramatic increase occurred.

Study Area and Methods

The study covered an area of 2,000 sq km and comprised East, Mid and West Lothian in addition to the City of Edinburgh. It was anticipated that the majority of non territorial swans would be located in flocks at Linlithgow Loch, the Almond Estuary at Cramond, St Margaret's Loch in Edinburgh, Inverleith Pond in Edinburgh, the Esk Estuary at Musselburgh, the Tyne Estuary and associated fields near Tynninghame, and the Water of Leith at Leith and that small numbers would be present at additional waters throughout the study area (D G Andrew, A T McMillan, G L Sandeman and R W J Smith, *pers comms*). Non territorial swans were counted in early and late April from 1978 to 1984 (Brown and Brown 1984) and subsequently during one coordinated mid April weekend. Additionally, visits were

made to potential territorial sites between late March and early May in order to record the number of territorial pairs.

Results

Total population

The total population increased by 318% between 1978 and 1998 (Appendix 1). As a substantial increase occurred after 1985 (Figure 1) data were divided into 2 time periods, 1978 to 1985 and 1986 to 1998 (Brown, 1997). The mean annual increase was 1% from 1978 to 1985 but the trend was not significant (Spearman Rank Correlation Coefficient, $r_s = 0.667$, $n=8$, $p>0.05$). A significant upward trend ($r_s = 0.989$, $n=13$, $p<0.01$) occurred between 1986 and 1998 when the mean annual increase was 10%.

Non territorial population

A mean annual decrease of 3% was recorded in the number of non territorial swans between 1978 and 1985, although this trend was not significant ($r_s = 0.000$, $n=8$, $p>0.05$). A mean annual increase of 12% occurred during the period 1986 to 1998 which was significant ($r_s = 0.984$, $n=13$, $p<0.01$).

During the early years the majority of non territorial swans occurred at the coastal site of Tynninghame which held a mean of 54 birds and 87% of the Lothians non territorial population during the first 3 years of this study (Figure 2). There was no significant trend in numbers there from 1978 to 1998 ($r_s = 0.296$, $n=21$, $p>0.05$) with the mean fluctuating around 52 birds. During the last 4 years the site held a mean of 58 swans but

Figure 1 The total (•), non-territorial (o) and territorial (+) numbers of Mute Swans in the Lothians from 1978 - 1998.

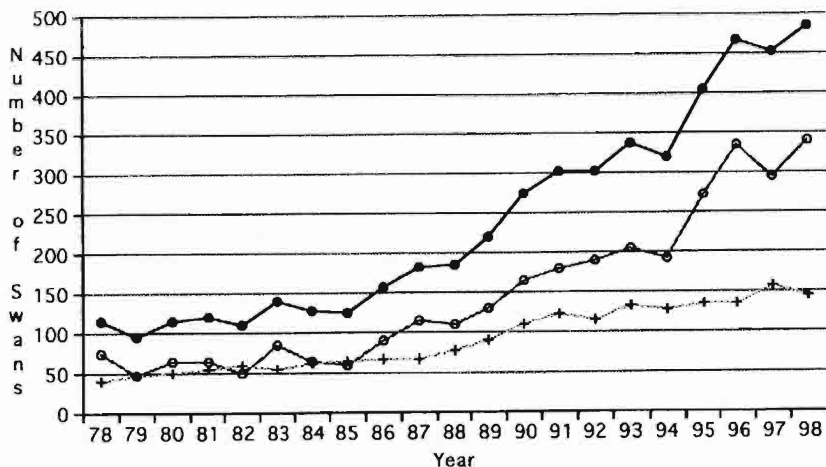
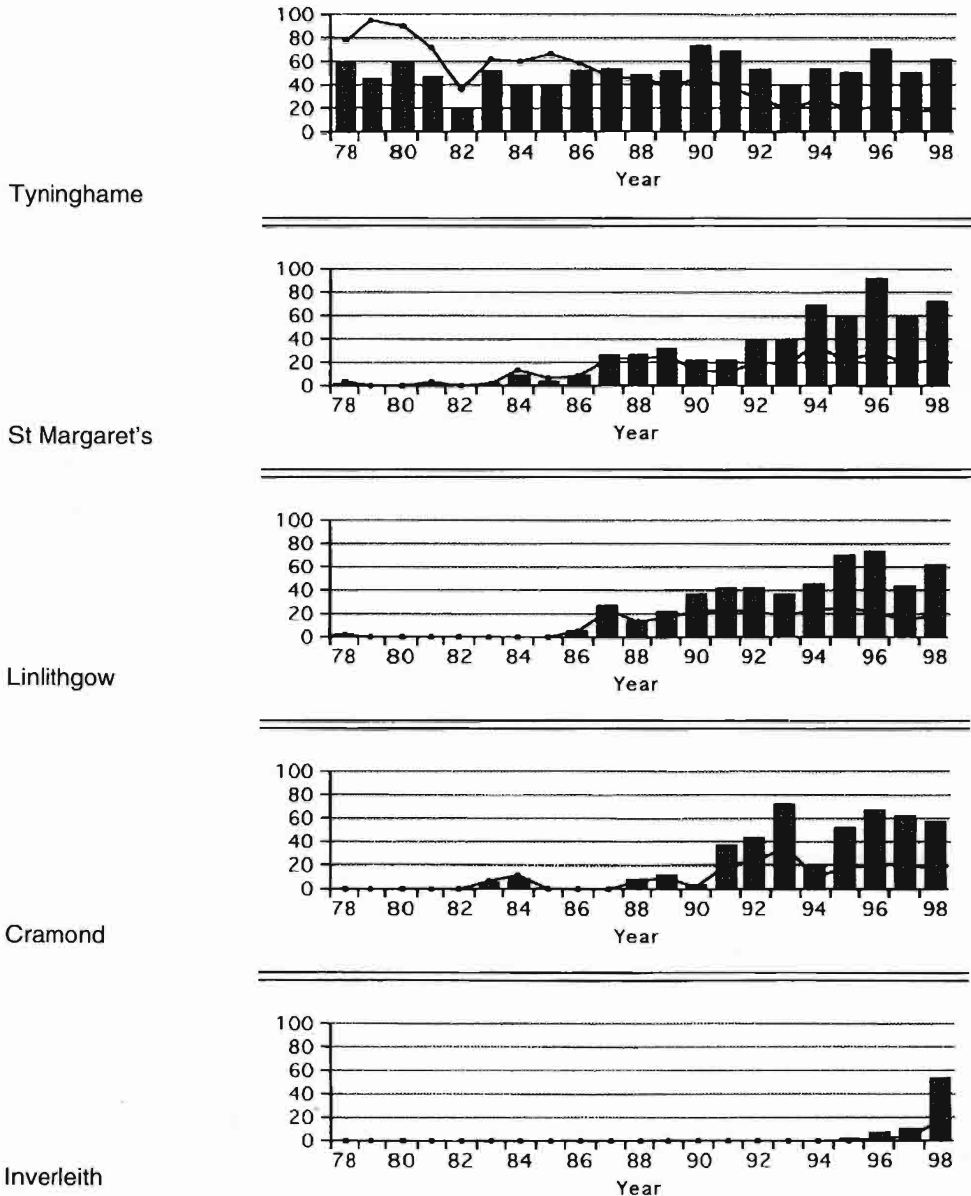
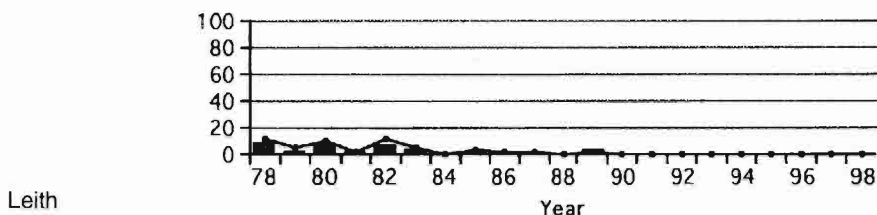
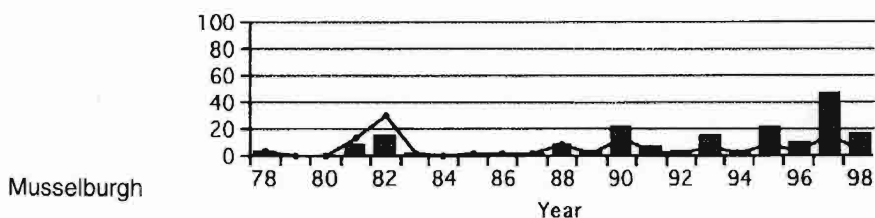


Figure 2 The number of non territorial Mute Swans present in flocks in April and their proportion (%) of the Lothians non territorial population (---) from 1978 - 1998.





only 19% of the non territorial population. St Margaret's Loch was continuously occupied from 1983 with a build up in numbers to a mean of 70 during the period 1995 to 1998 which constituted 23% of the non territorial population. Occupation of Linlithgow Loch commenced in 1986, followed by an increase to a mean of 62 and 20% of the non territorial population during the last 4 years of the study. Small numbers were recorded intermittently at Cramond up to 1990; however, since 1991 numbers consistently exceeded 18, reaching a mean of 59 or 19% of the non territorial population from 1995 to 1998. Development of these 3 flocks contributed substantially to the significant increase in numbers in the Lothians between 1986 and 1997.

Results show that these flocks rarely exceeded 70 swans and in the last 4 years each held about 20% of the non territorial population and around 60 birds. Each site appeared capable of holding many more swans, however, overall density may have

been less important in determining flock size, but rather individuals may have been less successful when competing for available resources, eg food, in a flock in excess of about 60 swans. Thus when a flock approached that size then swans tended to move to a smaller flock or to establish a new flock, as happened with the recent development of a flock at Inverleith Pond (Figure 2). Such behaviour may also account for the lack of an overall increase in numbers at Tynninghame. Although a flock occurred at Musselburgh in most years, numbers remained low during the last 4 years of the study when it held a mean of just 8% of the non territorial population. Permanent flooding of the Water of Leith at Leith and the associated demise of the flock there was documented by Brown and Brown (1984).

Territorial population

A significant upward trend occurred in the number of swans in the territorial population during the period 1978 to 1985 ($r_s = 0.994$,

$n=8$, $p<0.01$) and during the period 1986 to 1998 ($r_s=0.981$, $n=13$, $p<0.01$) when mean annual increases for both periods were 7%. Although the number of territorial swans increased, this section of the population decreased as a percentage of the total population during the study period. Overall a mean of 38% of the total population comprised territorial swans, the mean for the period 1978 to 1985 was 46% (range 34% to 54%) and the mean for the period 1986 to 1998 was 36% (range 29% to 43%).

During the early period of the study the percentage of territorial and non territorial swans in the total population overlapped (Figure 3) and showed no significant trend ($r_s=\pm 0.452$, $n=8$, $p>0.05$). A contrasting pattern was evident when the total population increased substantially between 1986 and 1998; the percentage of territorial swans

was consistently less than the percentage of non territorial swans with a significant divergent trend ($r_s=\pm 0.791$, $n=13$, $p<0.01$).

Territorial habitats in the Lothians were categorised as canal, still water (ponds, lochs and reservoirs) or river. The mean annual increase between 1978 and 1998 on canal habitat was 13%, on still waters was 9% and on rivers 1% (Figure 4). In 1978 river habitat comprised 45% of the total number of territorial pairs but this had decreased to only 15% in 1998. At the same time the percentage on canal habitat increased from 5% to 15% and on still waters from 50% to 70% (Appendix 2). Thus, although the number of pairs increased the percentage change was not consistent over all habitat types and river habitat became less attractive to territorial swans.

Figure 3 The percent of non territorial (.) and territorial (o) Mute Swans in the total population in the Lothians in April from 1978 -1998.

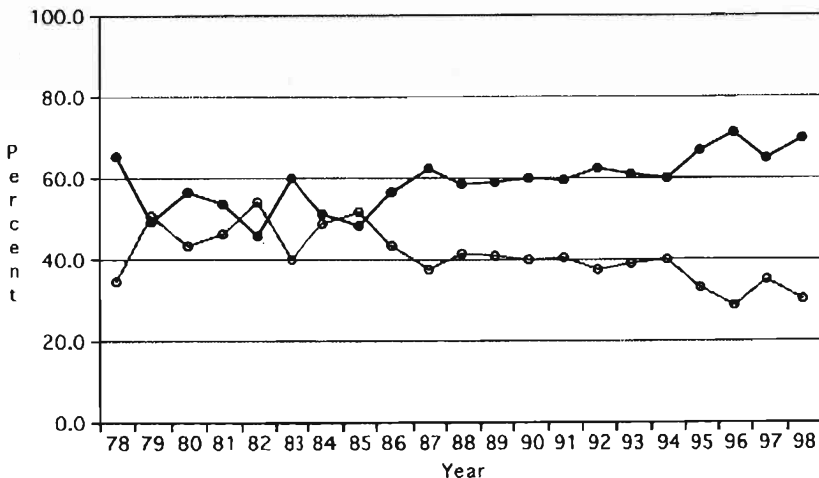
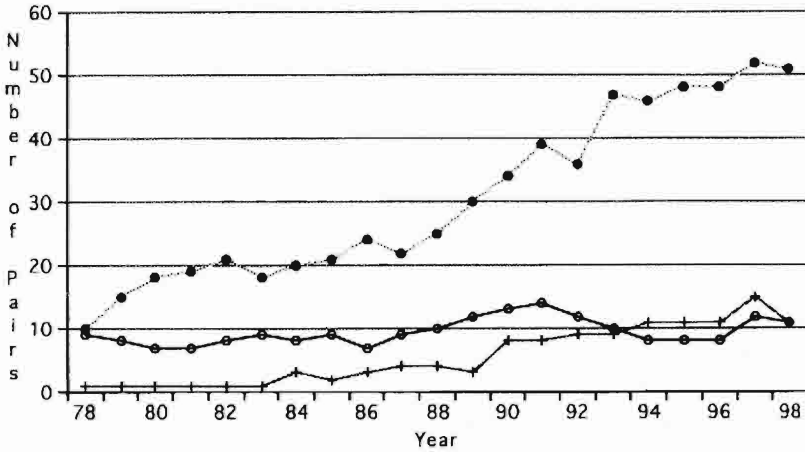


Figure 4 The number of territorial pairs on still waters (•), rivers (o) and canals (+) in the Lothians from 1978 -1998.



Discussion

The Mute Swan population in north west Europe increased by 60% between 1984 and 1994 (Rose 1995). Results from the Common Bird Census and Waterways Bird Survey indicated that the British breeding population increased in number during the past 20 years (Marchant *et al* 1998) whilst results from the Wetland Bird Survey show that winter numbers increased also (Cranswick *et al* 1997). Although constituting only about 5% of the Scottish population (Rawcliffe 1958; Ogilvie 1981; Brown and Brown 1985; Brown and Brown 1993) the Lothians appear to have reflected the trend in the numbers in the wider population.

Population growth theories (Begon *et al*, 1986) suggested that, because the Lothians population was low in the late 1970s any increase in numbers would have been slight during the early years of the study. Then, as the number of territorial pairs increased and

by inference the number of births, a more rapid population increase would have followed. Density dependency would eventually cause the exponential rate of growth to cease and hence the population numbers to level off resulting in an upper asymptote and a sigmoidal growth curve, if environmental factors remained favourable. During the period 1978-85 there was no significant trend in the total population in the Lothians nor in the number of non territorial swans, although an increase was apparent in the territorial population. The upward trend in the territorial population continued during the period 1986-98 during which time the non territorial population, and consequently the total population, demonstrated a similar trend. However, the population continued to grow exponentially and there was no indication of density dependent growth by 1998. As yet it is unclear if the long term population change in the Lothians will conform to a sigmoidal pattern of growth.

Of the 7 sites which held flocks of non territorial swans, numbers increased initially at the inland sites of St Margaret's Loch and Linlithgow Loch, slightly later at the coastal site of Cramond and most recently at the inland site of Inverleith Pond. The stepwise initiation of new flocks suggested site preference, although development of a new flock did not depend upon existing sites reaching capacity, except in the case of Inverleith Pond. A similar pattern was demonstrated earlier by Suter (1995) amongst Cormorants *Phalacrocorax carbo* wintering in Switzerland. New flocks of Mute Swans were located across the study area and their development reflected the exponential increase in non territorial and territorial swans throughout the Lothians. The divergent trend in the percentage of territorial and non territorial swans coincided with the period of exponential growth and was in part dependent upon the presence of suitable habitat across the Lothians.

Increased urbanisation with its associated drainage schemes, modern efficient agricultural drainage systems and extraction of water from rivers for crop irrigation have all affected water levels in rivers. Widely fluctuating levels undoubtedly lead to changes in aquatic vegetation and to flooded nest sites and probably had an adverse effect on the number of territorial pairs of Mute Swans on rivers. Conversely, creation of farm ponds and reservoirs contributed to the increased number of pairs on still waters. The reason for the delayed increase in the number of pairs on canal habitat is unclear since water levels were maintained at a fairly constant height and aquatic vegetation was apparently abundant. Not all territories were occupied each year and consequently the territorial population has the capacity to increase further.

Whilst some non territorial flocks became density dependent and numbers levelled off, the development of new flocks suggested that the non territorial population itself was not density dependent and likely to increase further. Similarly, an absence of density dependency in the territorial population was apparent and it is concluded that the Lothians Mute Swan population has the capacity to increase in future years.

Acknowledgements

We thank John Ford, Robin Henderson, Mick Marquiss, Malcolm A Ogilvie and William S Penrice for their invaluable advice and constructive comments on earlier drafts of this paper. Many people have contributed to this study by submitting their counts of swans and their assistance is greatly appreciated. In this respect we are especially grateful to John Helliwell, Derek Henderson, Jane MacGregor and Eric Wyllie.

The cooperation of private landowners, local authorities and national agencies has been invaluable and much appreciated. In addition we are grateful to the Scottish Ornithologists' Club, British Trust for Ornithology, Fife Council, Scottish Natural Heritage, Exxon Chemicals and Shell Expro for financial support.

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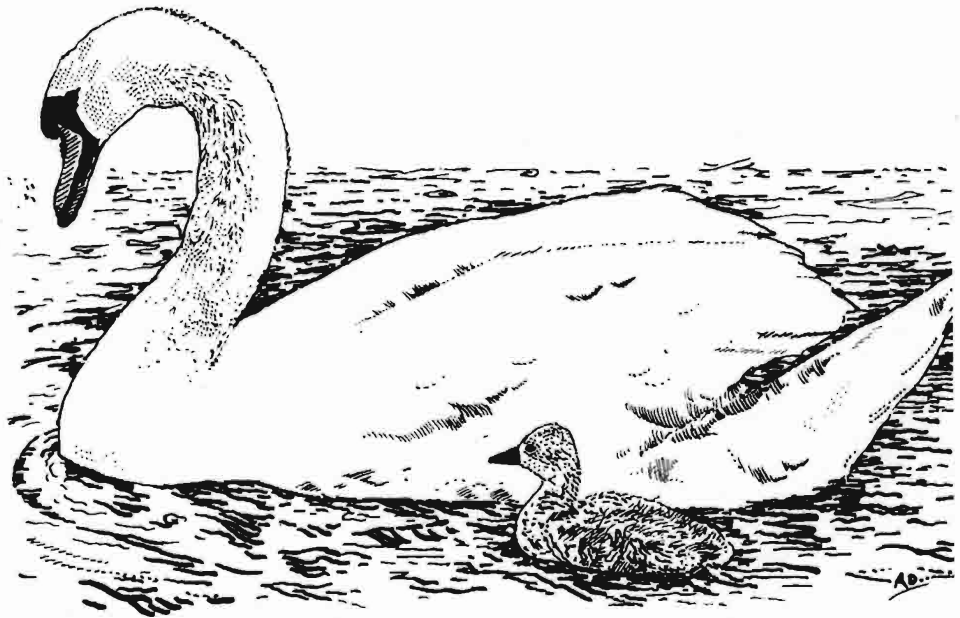
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Revised manuscript accepted April 1999



Mute Swan with cygnet

Andrew Dowell

Appendix 1 *The number of Mute Swans present in the Lothians each April from 1978 - 1998.*

Appendix 2 *The number of territorial pairs of Mute Swans by habitat in the Lothians from 1978 - 1998.*

Year	Population in spring	Non territorial swans	Occupied territories
1978	116	76	20
1979	95	47	24
1980	115	65	26*
1981	121	65	28
1982	111	51	30
1983	140	84	28
1984	127	65	31
1985	124	60	32
1986	157	89	34
1987	182	114	34
1988	186	109	39*
1989	220	130	45
1990	275	165	55
1991	302	180	61
1992	303	189	57
1993	337	205	66
1994	321	193	64
1995	406	272	67
1996	468	334	67
1997	452	294	79
1998	485	339	73

Year	Territorial pairs on rivers	Territorial pairs on canals	Territorial pairs on still waters
1978	9	1	10
1979	8	1	15
1980	7	1	18
1981	7	1	19
1982	7	1	21
1983	9	1	18
1984	8	3	20
1985	9	2	21
1986	7	3	24
1987	9	4	21
1988	10	4	25
1989	12	3	30
1990	13	8	34
1991	14	8	39
1992	12	9	36
1993	10	9	47
1994	8	11	46
1995	8	11	46
1996	8	11	48
1997	12	15	52
1998	11	11	51

* *The apparent discrepancies in the total population for 1980 and 1988 were due to 2 territories in 1980 being defended by single birds while in 1988 one territory was similarly occupied.*

SHORT NOTES

Swifts nesting in Scots Pines at Abernethy Forest, Strathspey

Generally, Swifts *Apus apus* nest in holes of old buildings in towns (Birds of the Western Palearctic Vol 4). However, natural nest sites, such as holes in large trees and on cliffs, are known to be used in a number of locations in Europe eg in trees in the Bialowieza Forest, Poland (Tomialojc *et al* 1984, *Acta Orn* 20: 241-310). Records of nest sites in trees in Britain are rare. Swifts were recorded nesting in old woodpecker holes in pines in ancient forest along the River Beauly around 1835, but, along with the decline of Great Spotted Woodpeckers

Dendrocopus major and the ancient woodland, this habit was thought to have died out (Lack 1956, *Swifts in a Tower*, Methuen). However, there is a recent record of Swifts nesting in trees in Strathspey (Thom 1986, *Birds in Scotland*, Poyser). This note describes nest sites currently used by Swifts in the ancient native pinewood of Abernethy Forest, 57°15'N, 3°40'W in Strathspey.

Swifts occurred in the forest from May to August, and small groups were commonly seen flying over the canopy. Birds were observed entering holes of 10 Scots Pines *Pinus sylvestris* during 1996 to 1998, and were assumed to be nesting there. The mean nearest neighbour distances between nest trees was 0.82km (range 0.22 – 1.86km).

Table 1 Descriptions of trees used by Swifts at Abernethy Forest.

All the holes were woodpecker holes apart from 2(*) which were knot holes. DBH is the trunk diameter at breast height.

Grid ref	Tree height (m)	DBH (cm)	Live or dead	Surrounding tree density (no/ha)	Number of holes	Mean height of holes (m)
NJ007174	8.8	39	D	71	1	6.6
NJ008132	18.8	43	D	309	3	13.3
NJ022163	24.7	72	L	138	1*	11.4
NJ023141	20.2	58	D	265	2	7.3
NJ024137	16.0	115	D	605	13	10.4
NJ025143	15.2	86	D	301	5	11.0
NJ026145	18.7	119	L	442	5	9.1
NJ044150	21.0	142	L	51	16	10.2
NJ045154	19.5	97	D	118	1*	14.7
NJ052152	10.5	83	D	354	3	7.5

Plate 1a *A dead Scots Pines at Abernethy Forest where Swifts nest in old Great Spotted Woodpecker holes.*
Ron Summers



Plate 1b *A live Scots Pine at Abernethy Forest where Swifts nest in old Great Spotted Woodpecker holes.*
Ron Summers



The majority of the holes were old excavations of Great Spotted Woodpeckers (Plate 1a & 1b). Two sites were knot holes. The nests were either in the trunk or in large branches. Seven of the trees were dead. In one of the five pines, all 16 holes were in dead branches (Table 1).

Tree height averaged 17.3m (measured with a clinometer) and the mean diameter at breast height (DBH) was 85cm (Table 1). The dead trees averaged 15.6m in height and 74cm in DBH. These dead trees are some of the largest in Abernethy Forest. Only 5.7% of a representative sample of standing dead trees in the old forest had a DBH of greater than 39cm, the minimum size in Table 1 (RSPB unpublished data).

The number of holes in the trees ranged from 1 to 16, but it is not known how many were used as nest sites by the Swifts. The mean height of the holes was 10.2m (range 6.6 – 14.7, Table 1). The mean height of the holes excavated by woodpeckers was 9.4m. This was significantly higher than holes excavated

by woodpeckers in 36 trees not used by Swifts (the difference was 2.4m, $t = 2.3$, $P = 0.027$), indicating that Swifts preferred the higher sites. In a wide ranging study of woodpeckers in Britain, Glue & Boswell (1994, *British Birds* 87: 253-269) found that the median nest height of Great Spotted Woodpecker nests was only 4.9m.

The density of live and dead pines surrounding the Swift sites was 265 trees per hectare (range 51 – 605), typical of the old parts of the forest (Summers *et al* 1997, *Botanical Journal of Scotland* 49: 39-55). The low density of trees presumably makes it easier for Swifts to fly between the crowns of the trees and reach nest sites.

Given that most of the Swifts' nest sites were in old woodpecker holes, and woodpeckers are widespread in Britain, it is surprising that Swifts do not use them more commonly. Perhaps Swifts require old growth forest which provides the combination of high nest sites and a low density of trees. This habitat is rare in Britain.

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Revised manuscript accepted October 1998

Size of Merlin pellets in winter and summer in Galloway

There are, apparently, no published data on the dimensions of pellets ejected by Merlins *Falco columbarius* in winter or summer in Britain. In the North American subspecies, however, pellets average about 25 x 12 mm (Johnson & Coble 1967, *Jack Pine Warbler* 145: 97-98). Between 1970 and 1977, I collected 88 pellets from a winter roost and 76 pellets from breeding areas in Galloway. The pellets were measured when dry at their widest point and their length was measured to their tapered ends. I am confident that no other raptor species pellets were in these samples.

The length of 88 winter pellets measured from 12mm (min) to 41mm (max) with a mean length of 23.6mm ± 6.72mm SD; their width measured from 6mm (min) to 16mm (max) with a mean width of 11.3mm ± 1.87mm SD. The length of 76 breeding season pellets measured from 12.5mm (min) to 53mm (max) with a mean length of 29.3mm ± 8.84mm SD; their width measured from 8mm (min) to 16.5mm (max) with a mean length of 11.6mm ± 2.09mm SD. Thus the most common size of 42 (48%) winter pellets at 20-29mm was slightly longer than the size of 31 (40%) breeding season pellets, but no distinction was made from adults and young birds pellets. The most common size of 57 (65%) winter pellets at 10-12mm was wider than the size of 32 (42%) breeding season pellets (Figures 1 and 2).

Fig. 1. Frequency of Distribution of size of Merlin pellets in winter and summer

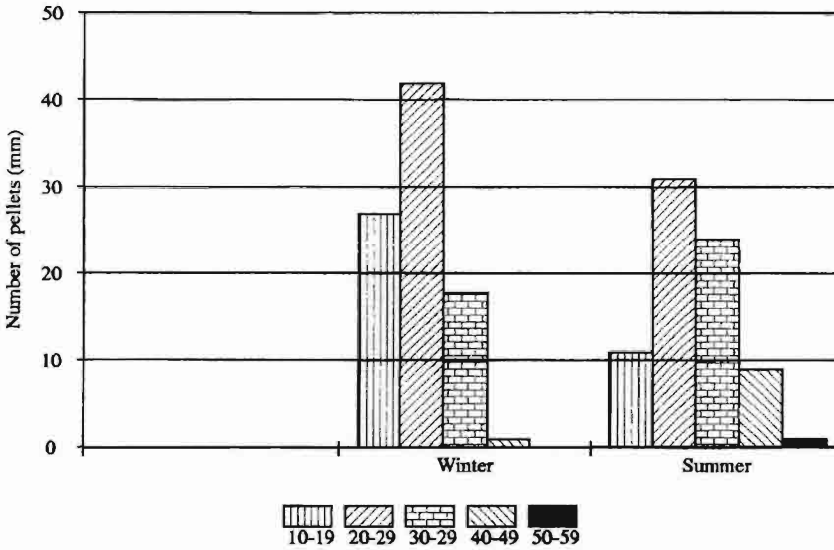


Fig. 2. Frequency of Distribution in the width of Merlin pellets in winter and summer

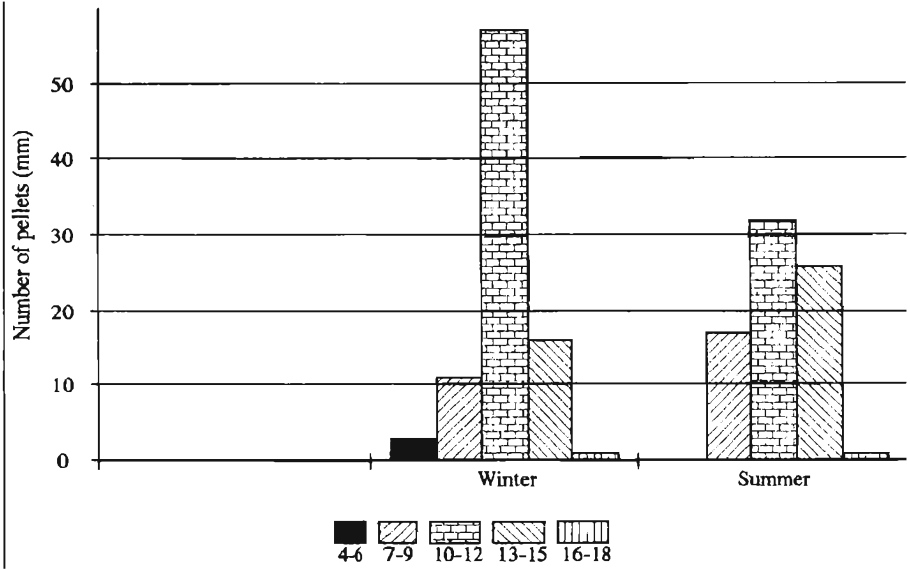


Fig. 3. Frequency of Distribution in the length of Hen Harrier pellets in winter

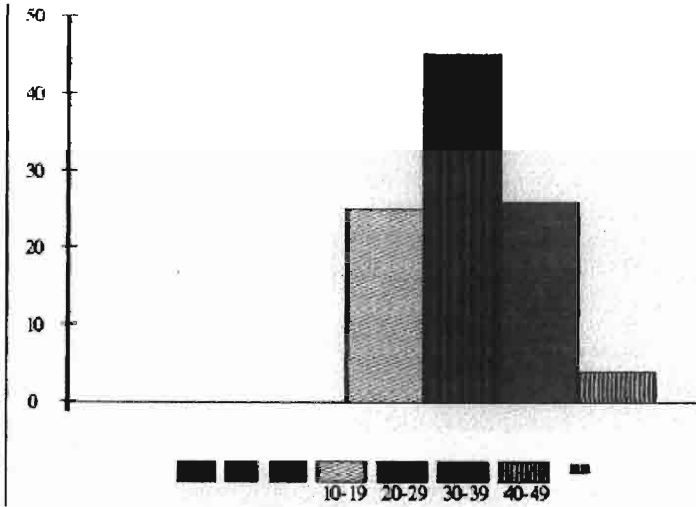
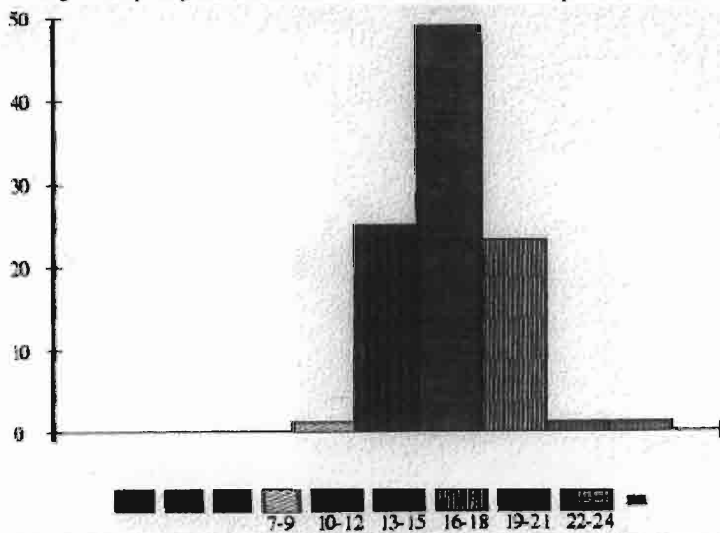


Fig. 4. Frequency of Distribution in the width of Hen Harrier pellets in winter



In comparison, Merlin pellets are about the same length as those from Kestrels *Falco tinnunculus* at 20-30mm but are smaller in width at 12-17mm (Village 1990, *The Kestrel*, London). The commonest size of Merlin pellets are slightly larger than Sparrowhawks *Accipiter nisus* which seldom exceed 20mm x 10mm (Newton 1986, *The Sparrowhawk*, Calton). During the same period I measured 100 Hen Harrier *Circus cyaneus* pellets from their winter roosts, the species most likely to

be mixed with Merlin pellets as they often share the same roosts. They measured between 46mm x 8mm with a mean length and width of 26.25 ± 7.46 mm SD and 14.21 ± 2.37 mm SD. Interestingly, the majority of Hen Harrier pellets at 20-29mm (45%) were the same length as the majority of Merlin pellets (48%) (Figures 1 and 3); Hen Harrier pellets are generally larger in width at 13-15mm in winter (Figure 4) compared to Merlins which are smaller at 10-12mm (Figure 2).

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Revised manuscript accepted November 1998

Corn Bunting decline in Easter Ross

We report a decline to apparent extinction of Corn Buntings *Milaria calandra* in Ross in 1991-97. We saw birds from near the coast between Shandwick and Tarbat Ness, west to Arabella and Fearn Station. All but 3 were east of a line from Easter Arbol through Meikle Rhynie to Loans of Tullich. We put in most effort there, but also searched each year from Tain to Nigg. Almost all summered north of Tarrel (A) and south of Lower Pitkerrie (B). Although this was a small area, density was locally high, with adjacent cocks' song posts as near as 100m.

Winter. In March 1991, 65 from Hilton north to Wilkhaven (35 north of Seafield and 30 at Hilton), all in cereal stubble bar 6 eating grain at sheep troughs on grass. In September 1991, one, one and 8 in cereal stubble in A. In January 1992, 40 at Balmuchycrossroads and 7 at Seafield, on cereal stubble. In November 1993, 5 in A including 2 in cereal stubble and 1 in turnips. In February 1997, 7 at Cadboll Mount. None was seen in winter 1997-98.

Summer. 1991, cocks were found singing from Shandwick north to Templecroft (15 in A and 15 in B including one at Glastullich and one at Arabella). These 30 were just under half the 65 in March, as expected from a

presumed sex ratio of about 1:1. Out of 23 cocks where we noted crop type, 7 sang above spring barley, 6 winter rape, 6 grass, 3 winter barley and one winter wheat.

1992, 27 cocks were recorded from Shandwick north to Templecroft (16 in A and 11 in B including one in Arabella). Out of 25 cocks where we noted crop type, 11 sang above spring barley, 6 winter rape, 5 grass, 2 winter barley and one in oats.

1993, 24 cocks were recorded from Hilton to Templecroft (11 in A and 13 in B). Out of 16, 5 sang above spring barley, 4 peas, 3 set aside, 2 winter barley, one winter rape and one in potatoes. Turnips, potatoes, peas and rape were in 20% of fields, grass 40% and cereals 40% (HM). A car killed a hen carrying food.

1994. In April, 4 sang in a sunny spell at Seafield where we saw 2-4 in 1991-93, and no others were seen but weather was bad. Later, one cock was in B, 2 at Bindal, where AW and MNT saw 1-2 in 1991-93, and one each at Lochsline and Loans of Tullich (0 and 0-1 in 1991-93). This suggested no decline up to 1994.

1995-98. In 1995 a singing cock was at Bindal and one at Nigg. In May 1996 one was at Wilkhaven and no birds were seen in summer 1997 or 1998.

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Accepted December 1998

A further survey of Twites wintering in Caithness

Over the 3 winters between 1992 and 1994 we carried out 5 surveys of Twites *Carduelis flavirostris* wintering in Caithness (Clark & Sellers 1997, *Distribution and abundance of Twites wintering in Caithness, Scottish Birds* 19: 1-9). These showed winter numbers to be typically around 2,000-3,000 birds with a peak of about 7,000 birds, the latter coinciding with an abundance of unharvested Oil Seed Rape *Brassica napus*. The surveys also showed that the main habitats used were weedy Turnip *B napa* fields, uncut rape and rape stubbles when available, and to a lesser extent other stubbles, weedy areas such as roadside verges and Marram Grass *Ammophila arenaria*. With the passage of several years since the completion of this work and against the backdrop of a perceived continuing decline in the species' numbers (Clark & Sellers 1997, *Twite Winter Habitats in Scotland: Results of the 1997 questionnaire*

survey, unpublished report) it seemed of value to carry out a repeat survey to see whether any significant change in numbers has taken place. We present here the results of such a survey carried out in December 1998.

Survey methods were as described in our earlier paper, except that we were fortunate enough to secure assistance from 3 other counters, rather than 2 as before. Habitat types follow those listed in Clark & Sellers (1998, *Winter habitats of Twites in Scotland, Scottish Birds* 19: 262-269). This new survey was conducted over the weekend of 12-13 December 1998 and attempted to locate all Twite flocks in Caithness. The weather for both days was good with mainly cloudy bright conditions with sunny spells, light winds, minimal rain (one or two short showers only) and maximum daytime temperatures of 7°C on 12 December and 3°C on 13 December.

Table 1 Summary of results from 12-13 December 1998 survey of Twites in Caithness.

	Turnips	Rape & rape stubbles	Other stubbles	Uncut oats	Others
No of flocks	21 (49%)	9 (21%)	8 (19%)	3 (7%)	2 (5%)
No of birds	1880 ^a (32%)	3280 ^b (55%)	598 (10%)	146 (2%)	23 ^c (<1%)

a Includes a flock of 150 birds on turnips and barley stubbles, and one of 300 birds on turnips and fodder rape.

b Includes flocks of 120 and 220 birds on rape and barley stubbles

c One flock of 15 on potatoes and one of 8 on setaside

The results obtained are summarised in Table 1. A total of 5927 birds was recorded in 43 flocks ranging in size from 8 to 1,500 birds, with a mean of 138 birds. The very large flock of 1,500 birds had been present at South Murkle between Thurso and Castletown for some weeks prior to the survey and, so far as we are aware, is the largest ever recorded in Scotland. There was a second large group numbering 1050 birds (flocks of 300, 300 and 450) on 8 adjacent fields of rape and rape stubbles at Nipster, roughly midway between Thurso and Wick. Overall, the 7 flocks of ≥ 300 birds accounted for 60% of Twites located, and flocks of ≥ 100 birds for 85%. The flocks were distributed throughout the normal winter range in Caithness, the larger ones being associated mainly with the intensively farmed area between Thurso and Wick, and the smaller flocks with more peripheral areas, especially the north west of the county. The majority of birds and most of the larger flocks were found in fields of uncut rape or rape stubbles, whilst turnip fields accounted for almost half of flocks and almost a third of birds. The only other habitats from which they were recorded were barley and oat stubbles, uncut oats, fodder rape, setaside and weedy potato fields.

There had been difficulties with the harvest of crops, especially rape, in Caithness in 1998 because of bad weather, and much rape seed had been spilt from the seed pods before they could be gathered in. Furthermore water logging of the ground had prevented many of the rape and other stubbles being ploughed in, such that by the time of our survey there was much more food available for the birds than was usual. As in December 1992, another year when there was a superabundance of rape seed, the number of birds found was at the upper end of the range of variation so far recorded, and the results reaffirm the importance of rape seed to Twites and that the number of birds in Caithness in mid-winter is related to the abundance of food (*cf* Table 2).

Twites wintering in Caithness originate from Caithness itself, the NW Highlands, the northern part of the Western Isles and the Northern Isles (Clark & Sellers 1998, *Movements of Twites in Scotland, Scottish Birds* 19: 270-279). We suspect that the variable numbers in Caithness are a result of passage birds from the Northern Isles, and possibly those from the Caithness breeding population, staying in Caithness when food

Table 2 Winter numbers of Twites in Caithness in relation to availability of rape.

	Date	No of birds	No of flocks	Availability of rape
1	14-15 Nov 1992	2368 ^a	19	high
2	28-29 Dec 1992	6882	20	high
3	4-5 Dec 1993	2136	26	low
4	3-4 Dec 1994	3036	30	low
5	29-30 Dec 1994	2873	19	low
6	12-13 Dec 1998	5927	43	high

a This count was made before all wintering birds had arrived or passage was complete

is abundant, but moving further south when it is not. It follows that surveys such as ours are at best only a very crude indicator of the general fortunes of Twites in Scotland; however, it seems reasonable to conclude that there has been no marked reduction in the northern Scottish populations over the past 6 years.

We are indebted to Peter Miller, Donald Omand and Julian Smith for their unflinching help with the surveys, and Mark Hancock, Ian Bainbridge and RSPB Scotland for their encouragement and support throughout.

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Revised manuscript accepted January 1999

Goldcrest nest sites in witches' brooms

The nests of Goldcrests *Regulus regulus* are typically suspended in twigs near the end of conifer branches but, where typical sites are not available, in the forks of branches (*Birds of the Western Palearctic* vol. VI p.682). In north west Sutherland there are no coniferous woods north of Laxford Bridge and Gobernuisgach Lodge except for small plantations at Eriboll Lodge, Inverhope and Durness. There are old and often degenerate Birch *Betula* woods along sheltered glens, eg in Strath Beag, Strath More and along the shores of Loch Hope and Loch Eriboll; otherwise the land is virtually treeless. Goldcrests are uncommon (Gibbons *et al* 1993 *The New Atlas of Breeding Birds in Britain and Ireland: 1988-1991*, Poyser) in what appears to be an unsuitable habitat, though in Sutherland generally they are described as "usually in good numbers, breeding in native and plantation woodland" (Angus 1993, *Sutherland Birds* Northern Times).

At Eriboll in summer 1989 a Goldcrest was seen carrying food to its young in a nest at 3m in a witch's broom, a circular twiggy outgrowth on the branches up to 1m in diameter but more usually 0.5m, in an 11m high old Birch tree in a small area of Birch and Willow *Salix*. Droppings at the nest entrance in February 1990 suggested roosting by Goldcrests or Wrens *Tragodytes tragodytes*. Two further Goldcrest nests were found in witches' brooms in Birch in 1989, one at Eriboll and one near Loch Loyal.

In March 1990 23 Birches with witches' brooms large enough to contain Goldcrest nests were examined at Eriboll. Eleven trees were in a gully, widely spaced, in a grazed pasture; 12 in a small old birch wood. In a witch's broom in the isolated trees there was an old Chaffinch *Fringilla coelebs* nest and in the wood single nests of Chaffinch and Wren or Goldcrest. Casual searches subsequently produced an old Song Thrush *Turdus philomelos* nest 1.3m above the ground in a witch's broom on a substantial limb of an old Birch and an unlined Wren nest at 2m, again in an old Birch.

Ten birch trees holding 24 witches' brooms, 19 of them big enough to contain a Goldcrest's nest, were examined at Laxford Bridge in 1992-93. Only one partly built but unidentifiable nest was found. Further casual searches revealed no Goldcrest nests in Birch. This was to be expected as there were conifer plantations in the area. However, a partially built Goldcrest's nest was found on 25 June 1997 in a witch's broom in a Birch in a small native wood; the

young fledged in the first week of August. A large area of conifer nearby had been recently felled and this may have led to the use of Birch for nesting.

Goldcrest nests in witches' brooms were suspended beneath slender branches similar to the outer branches of conifers. Those of Chaffinch and Song Thrush were in witches' brooms growing on stouter branches and were on the upper side of these.

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Accepted January 1999

Goosander killing a frog

At 12.15 hours on Monday, 15 February 1999 I was in the hide at a small pond adjacent to the loch at the James Hamilton Heritage Park in East Kilbride. A male Goosander *Mergus merganser* suddenly surfaced immediately in front of the hide holding a large frog *Rana* sp. By the large size of the amphibian I took it to be a female. The Goosander held the frog by one thigh and proceeded to swing it round and round in a circular fashion in what I presume was an attempt to subdue it. After a few seconds of this treatment the Goosander deftly turned the frog and swallowed it head first with apparent ease. I can find no specific mention of frogs as a food for Goosanders in any of the current ornithological literature. One gets the impression that they feed almost exclusively on members of the salmon family.

Dr M Marquiss has commented:

This note is interesting because it draws attention to the varied diet of these ducks. Though not reported in the general bird literature, to judge from the contents of Goosander stomachs (Marquiss et al 1998 Fish eating birds and salmonids in Scotland 156 pp. The Scottish Office, Edinburgh) it is clear that frogs are regularly taken in February and March when many Goosanders switch from feeding on rivers to still waters (Marquiss & Duncan 1994 Seasonal switching between habitats and changes in abundance of Goosanders Mergus merganser within a Scottish river system. Wildfowl 45, 198-208).

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Revised manuscript accepted March 1999

Merlin's sunning behaviour in summer

I read with interest the note (Dickson 1998 *Scottish Birds* 19:176) on the sunning behaviour of Merlins *Falco columbarius* in winter. Apparently information on the sunning behaviour of Merlins in summer in Britain is generally lacking and so I have been encouraged by R C Dickson to submit this note.

On 5 May 1989, I visited a Merlin's nest site in Dumfriesshire on a bright, warm, sunny day. The female was apparently nest selecting and at times nest scraped at various places on a steep heather clad hillside, and on one occasion she was accompanied in this by the adult male. On several occasions, however, she lay spreadeagled on top of the

heather with fully outstretched wings and partly fanned tail, sunning, sometimes for up to a minute before changing position. At other times she sat erect and faced the sun as if sun basking, behaviour which I have often observed in female Merlins prior to commencement of laying.

Some falcons will spread their wings fully while sunning in the prone position on the ground, but apparently this has only been recorded hitherto of birds in captivity (Simmons 1986 *The Sunning Behaviour of Birds*, Bristol). Dickson (1995 *Scottish Birds* 18: 58-59) has recorded the full spread open wing sunning position on the ground by Peregrine Falcons *Falco peregrinus* in winter in the wild, but the full spread open wing sunning position on the ground by Merlins in summer has not been documented previously.

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Accepted April 1999



Hen Merlin

Arthur Gilpin

Interlocking of talons between Common Buzzards

Further to R C Dickson (*Scottish Birds* 19:166), I have also observed Buzzards *Buteo buteo* interlocking talons during display manoeuvres. However, in this case no food was passed suggesting this was an aggressive action. On 6 March 1999 I noted 5 Buzzards soaring over an area approximately 1 km² of farmland and woodland beside Auchendores Reservoir near Kilmacollm, Inverclyde. From a roadside vantagepoint I watched 2 adult birds soaring in close proximity, which then unexpectedly flew steadily towards each other, interlocked talons and began cartwheeling, completing several turns, and dropping an estimated 10 to 15m in altitude from a soaring height in the region of at least 40m above ground level.

After this encounter, one of the birds flew a comparatively short distance westward and

disappeared over a small belt of woodland. The other individual continued soaring in an eastward direction towards a slope covered in Hawthorn *Crataegus monogyna* and Gorse *Ulex euopaeus* scrub interspersed with various tree species, where at least one juvenile Buzzard was calling noisily. In an area in which Buzzards are numerous, this is the first occasion on which I have noted this particular behaviour.

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Accepted April 1999

R C Dickson has commented that aggressive talon grappling is quite common in territorial Buzzards but cartwheeling has rarely been reported in Britain though a record of a courting pair cartwheeling is in Bird Study 1975 (22:261).

Grey Heron killed by Great Skua

At about 16.45 hours on 1 October 1998, whilst scanning the Bay of Firth at Finstown, Mainland, Orkney, I observed a Bonxie *Catharacta skua* cruising around the bay, at a height of about 19 metres. It made 2 complete circles of the inner bay and appeared to be looking for food; there were a few ducks, waders and gulls around. Since 28 September I had noticed a number of local Grey Herons *Ardea cinerea* which had the habit of flying across the bay. As the Bonxie was cruising about, I saw one of the herons, which had a white crown and was therefore an adult bird, flying slowly across the bay some 2m above the water. I was

amazed to see the Bonxie approaching it from above and behind, unnoticed, dive directly onto its back and knock the heron into the water, whereupon the Bonxie moved its feet onto the heron's head and forced it under the water until it drowned. During this time the Bonxie continued to remain air borne flapping its wings to gain the necessary force to keep the heron's head under the water.

Having killed the heron, which appeared to be healthy insofar as its ability to fly was concerned, the Bonxie spent about 10 minutes trying to turn the corpse over onto its back. It then proceeded to pluck and eat the larger bird. This took some hours to complete before the skua finally and rather ponderously

took off and flew off in the direction of Hoy.

Whilst I have occasionally seen skuas and indeed large gulls attack herons, I have never seen them killed in so efficient and rapid a manner as I witnessed that day.

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Revised manuscript accepted May 1999

Pomarine Skua kleptoparasitising an inland gull roost

Winter records of Pomarine Skua *Stercorarius pomarinus* in Scotland are scarce (Thom 1986 *Birds in Scotland*, Poyser, Furness 1987 *The Skuas*, Poyser) but showing increasing frequency in recent years (*Scottish Bird Reports*). Inland records are also rare (Thom 1986), especially away from autumnal gales, and long staying individuals inland are largely unknown. It came as a great surprise when a first winter bird was discovered in the Baron's Haugh and Strathclyde Park area of Lanarkshire on 31 December 1994 and stayed until 23 January 1995. This represented the first and only Lanarkshire record to date. With the exception of the first sighting at Barons Haugh, the bird was not seen away from Strathclyde Loch (an 81 ha artificial loch situated between Hamilton and Motherwell) throughout the rest of its stay.

Throughout much of the day the bird rested on Strathclyde Loch, rarely flying, presumably to conserve energy. Most of its activity was noted during the last 2 hours or so of daylight. At this time gulls from a wide area of central Lanarkshire converged upon the loch to roost.

Professor R W Furness has commented that there are previous records of Great Skuas killing herons (Furness, R W 1979. Foods of Great Skuas Catharacta skua at North Atlantic breeding localities. Ibis 121: 86—92). However, there are few descriptions of how such kills are made and this is a nice description of the method. My experience of herons in Foula is that most are juvenile birds that tend to weaken and are killed by skuas as they near death by starvation.

The most numerous species were Herring Gull *Larus argentatus* (up to 10,000) and Black-headed Gull *Larus ridibundus* (up to 5,000) with smaller numbers of Common Gull *Larus canus*, Lesser Black-backed Gull *Larus fuscus* and Great Black-backed Gull *Larus marinus* also present.

As the gulls flighted into the roost, the skua would take to the air and patrol up and down the loch, seeking out potential victims. As the gulls began to settle on the water the skua would fly towards the flock and flush them into the air. Once the flock was airborne, the skua would fly around underneath the flock to keep the birds aloft. It would then fly very fast almost vertically into and through the flock, executing a vertical stall followed by a high speed falcon like stoop and rapid pursuit behind the selected gull. The pursuit flights were variable in length but most lasted less than 30 seconds (based on approximately 60 chases observed over 5 different evenings). Although successful pursuits were recorded against all 5 gull species present, most (>80%) were against Herring Gulls. Approximately 20-25% of pursuits were successful in forcing the gull to regurgitate its last meal. Once the gull had regurgitated, the skua quickly fell to

the water surface to retrieve its reward, and alighted on the water to feed. The gulls then settled on the water again, but leaving a large space around the feeding skua, approximately 100m in diameter. Once finished feeding the skua would take to the air and flush the roosting gulls again until the daylight faded. The skua ceased activity around one hour after sunset. During the 90-120 minutes of activity each evening the skua would secure at least 5 or 6 regurgitated meals. The skua eventually roosted on the loch with the gulls again giving it a wide berth of approximately 100metres.

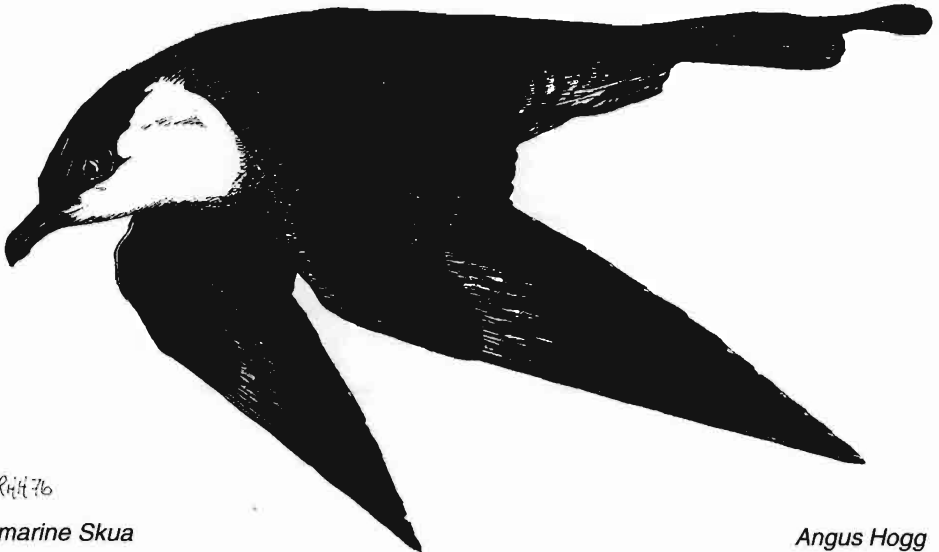
This level of disturbance was clearly unsettling to the gulls arriving to roost and, during the course of the skua's stay, the number of Herring Gulls using the loch to roost fell steadily from approximately 10,000 to about 1,500, whereas at this time of year gull numbers usually remain high at this site.

Furness (1987) records kleptoparasitism as a minor feeding strategy in Pomarine Skuas, compared to Arctic or Great Skuas. He comments '*Pomarine Skuas which winter in the warm, but rich upwelling areas, off West Africa, are thought to feed largely by predation of small seabirds such as phalaropes, and by scavenging*'. Kleptoparasitism of the gull roost appeared to be a successful short term strategy for a young skua inland in mid winter. However, it was clearly unsustainable, in that the prey species, Herring Gull, quickly learned to avoid the skua, with approximately 85% switching to use alternative roosting sites during the duration of its stay.

Thanks to Bob Furness, Iain Gibson and Stan da Prato who kindly read an earlier draft of this note.

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Revised manuscript accepted June 1999



Pomarine Skua

Angus Hogg

Large Kestrel clutch sizes in south west Scotland 1997-98

In 1997, Short-tailed Field Vole *Microtus agrestis* numbers peaked in Ayrshire as part of a regular 3 to 4 year cycle. The following season this occurred in West Galloway with a crash in vole number in late June. The abundance of voles as a prey item in both areas coincided with Kestrel *Falco tinnunculus* females laying large clutches and fledging large broods.

The average clutch size in 1997 in the Ayrshire study area was 5.8 (n=26), the highest recorded since work began in 1972. Eighteen nests contained clutches of 6 and one of 7 eggs. The average number of young produced per successful pair was 4.6 and one pair reared a brood of 7. In 1998, a smaller sample of 5 pairs was monitored in West Galloway and proved to be very productive with an average clutch size of 6.2 with one 7 and one 8. Fledging success was very high at 5.2 young per pair and again one pair reared 7 young.

Instances of Kestrels in Britain laying 7 or 8 eggs are not common even when weather

conditions are favourable and food plentiful. One other instance of 8 eggs being laid had been recorded in the Ayrshire study area in 1991. In the *Birds of the Western Palearctic* Vol 2, clutch size for Eurasian Kestrels is given as one to 7, and data from British Trust for Ornithology Kestrel nest record cards between 1950 and 1987 (Shrubb 1993, *The Kestrel*, Hamlyn) record only 3 clutches of 7 in Scotland and 8 clutches in England. Burton 1997 (Birds of Prey on Farmland *The Raptor* 24:16-20 Spring 1997) in southern England recorded only 4 broods of 7 in 14 years. By comparison, in a 12 year study in Finland, (Karen *et al* Hatching asynchrony in Eurasian Kestrels in relation to the abundance and predictability of cyclic prey, *Journal of Animal Ecology* 67:908-917) recorded 16 clutches of 7 and 3 of 8 eggs.

In our study in south west Scotland both observers were confident that in each case of 8 eggs the record clutches had been laid by single hens. This was based upon regular visits to the nesting territories, seeing only one female, and also the fact that the markings on each clutch were relatively uniform in colouration and marking indicating that one female had laid the entire clutch.

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Revised manuscript accepted June 1999

Recent fluctuations in a Common Sandpiper breeding population

The *Breeding Birds of south east Scotland: a Tetrads Atlas 1988-1994* (Murray, Holling, Dott & Vandome, 1998) states that the Common Sandpiper *Actitis hypoleucos* population in the Lammermuir Hills, SE Scotland had undergone a significant decline in recent years, and this prompted T W Dougal to analyse his data for the nearby Moorfoot Hills from 1993 to 1998.

This study was initiated largely to colour ring as many chicks as possible to complement the long term population studies in the Peak District by D W Yalden and colleagues, and to increase the national sample of the species ringed, surprisingly few of which are handled annually, given its abundance: 196 fully grown birds and 108 chicks in 1997. In 1998 A Mee began a research project involving the genetic fingerprinting of sub populations of TWD's study population.

Effort was concentrated along roadside stretches of the Blackhope and Dewar Waters near Garvald and Ladyside, and along the Glentress and Leithen Waters, where a car could be used as a hide, or where cover allowed a close approach to chicks. In

addition, adults were mist netted in the early part of each season, and throughout the season in 1998 in AM's sub populations using mist nets, nest traps and particularly effectively, baited spring traps. In this way, 10.13km of burns were sampled consistently over the 6 year period (AM's additional length is not treated here).

From observations of adult behaviour and the distribution of nests and broods, it was possible to estimate the number of territories held, and their success. For AM's more intensive study in 1998, breeding territories were accurately defined using the territory mapping method (Table 1).

In case the intensive effort of daily site visits by AM in 1998 introduced a bias, the data for this area only (as surveyed in previous years to TWD) were compared on an annual basis with the data from the remainder of the monitoring sites. In each year except one, where there was no change for the remainder sites, the direction of population change was the same, although the magnitude differed. It seems likely that AM found more territories than TWD would have with his less intensive effort, but only in the region of 2 territories, one successful (ie for 1998 in Table 1, if TWD and not AM had been involved, $n = 27$ and $\text{successful} = 19$).

Table 1 Common Sandpiper territories on monitored sites in the Moorfoot Hills, 1993-1998.

Year	n	n/km	successful	successful/km	% successful
1993	31	3.06	23	2.27	74.19
1994	22	2.17	15	1.48	68.18
1995	25	2.47	14	1.38	56.00
1996	21	2.07	14	1.38	66.67
1997	22	2.17	15	1.48	68.18
1998	29	2.86	20	1.97	68.97

It would appear, therefore, that over the 6 year period the Common Sandpiper population of part of the Moorfoot Hills fluctuated between 31 and 21 territories (3.06 and 2.07/km) overall, with the largest annual decrease of 29% between 1993-94 and the largest annual increase of 32% between 1997-98. There is no indication of an overall decline or increase in the population over the study period.

In the Peak District (sampling area = 10.05 linear km) DWY found that, over the same years, the population increased from 6.5 to 14 territories (0.65 to 1.39 /km) but these figures were depressed following a population crash of 37.5% in 1988-89 due to severe weather in the spring of 1989, followed by seasons of poor recruitment. Territories from 1988-92 had been 20, 12.5, 13, 10 and 7. At the start of the Peak District study in 1979-82 there were 20-22 territories annually (1.99-2.19/km, Holland & Yalden 1991 *Bird Study* 38:151-159).

Both the Moorfoots and Peak District studies show that local Common Sandpiper populations can suffer large and sudden decreases, but can recover well over a few years if conditions improve, though what are presumably sub optimal sites can remain without sandpipers for a number of years.

Nationally, the BTO's Waterways Bird Survey (WBS) index values (Mountford method) for the years 1993-98 are, respectively, 93, 93, 82, 85, 88 and 86; these are part of a recent downward trend from peak values of 121 and

125 in 1984 and 1985. However, it is thought that the 20 year trend is one of little change (Marchant, Wilson & Glue 1998 *BTO News* 216-217). DWY (in Gibbons, Reid & Chapman 1993 *The New Breeding Atlas*) has pointed out that most WBS census plots are not of optimum Common Sandpiper habitat as only 20% of plots and 19% total river length surveyed were fast flowing (Marchant *et al* 1998) so the fluctuations and long term trend may not be representative of the whole Common Sandpiper population. There is thus perhaps a need for increased monitoring of upland riparian bird populations, which could be addressed by more Breeding Bird Surveys (BBS) transects.

Although the overall population as expressed by territories / km, described in Table 1, ranges from 2.07 to 3.06, for the monitoring sites in the Garvald area only, it ranged from 2.80 to 4.80. The latter figure compares favourably with the maximum in any year of 4.70 reported from the prime stretch in the Peak District study area (Yalden 1986 *Bird Study* 33: 214-222) and would greatly exceed the Peak District figure if only the most productive stretch at Garvald was involved.

We thank the BTO for supplying the national WBS indices. We are grateful for help in the field to Lynn Campbell, Alan Lauder, Tony O'Connor and W Underwood. We are indebted to the various landowners and their agents for their interest and co operation with our studies. Especially Blackhope, Raeshaw, Rosebery Estates and M Cotterill, G Wainwright and the National Trust. AM's study is funded by NERC and SNH.

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Revised manuscript accepted June 1999

OBITUARY

Archibald Gordon Stuart Bryson

1912-1999



'Six keen naturalists met at 27 Inverleith Terrace to consider the proposal of starting a society for those interested in nature study and especially ornithology.' These words, from the record of a meeting of 6 Edinburgh Academy schoolboys on 6 November 1929, signalled the start of a whole stream of organisations leading on, one from another, which have provided a framework for amateur ornithology in Scotland ever since. The meeting at the start of that extraordinary process was of the Inverleith Field Club and

the list of its 6 members was headed by A G S Bryson, the others being H F D Elder, J H B Munro, H Simpson, J G Stewart and the Secretary, G Waterston.

Members of the Club took to making excursions to Aberlady Bay or Portmore and Gladhouse, or the coast along to Cramond. Notes of these were kept in a Club diary, written in black ink with the bird names in red. There were no field guides and precious few other books to guide them. They had to find their own way, which, by degrees, they did. '12 January 1930. One rather outstanding observation this month was that of Bryson and Simpson who saw a Great Crested Grebe at Granton.'

Individualism was valued. 'Rule 6. If a Member discovers a Bird's Nest, he is entitled to the sole proprietorship of the same, and Members wishing to photograph the nest or in any way molest it, must obtain the 'Owner's' permission.'

This exclusivity was extended to those beyond the Club and, while based on a genuine fear of egg collectors, was a characteristic which tinged some people's perception of the group and its successor bodies. 'Rule 7. Club members shall not divulge any information accumulated by other members of the Club to any person outside the Club.' Such information came to include the discovery of a diver and chick at Arisaig by Archie in 1930, which, after a subsequent visit to the Royal Scottish Museum, he was convinced was the first breeding record for Scotland of the Great Northern Diver.

By 1933, these teenagers were off into the wider world in their twenties and were more outward looking. Archie and the others resolved to found a larger group beyond the Academy, the Midlothian Ornithological Club,

because 'There are in Edinburgh, young energetic bird enthusiasts among whom there is little or no cooperation.' And 'The remarkable success of the Oxford Ornithological Society in accumulating scientific data on these lines (through corporate observation) is well known to all modern research workers'.

Much effort in the Club was spent in arguing about subspecies, an obsession of the time, and also in field observation whenever time allowed. Archie, now an apprentice CA, could be spotted of a Saturday lunch time after leaving the office, taking the train to Cobbinshaw and birdwatching round the reservoir equipped with rolled umbrella, bowler hat and binoculars.

Ringing birds was a favourite activity of the Club, but in those pre mistnet days migrants were hard to catch and a suitable place had to be found for the construction of a Heligoland trap. There was an ideal site not far away at the mouth of the Firth of Forth, and the Isle of May Bird Observatory came into being the following year, founded by this same company of friends – the first cooperatively managed bird observatory in Britain. The object was to have as much fun as possible while contributing something to the sum total of scientific knowledge. It should be remembered that at this time the amount of professional field ornithology was almost nil.

With only a small proportion of migrants caught in the single trap, identification of subspecies remained a vexing question and traditional means of obtaining specimens were not scorned. As Archie remarked laconically, though not without a touch of melodrama, in the Observatory log for 4 October 1935: 'The Chiffchaff was shot at dawn. He was certainly not Siberian and his large measurements suggested

Scandinavian. Fifty two species were seen during the day.'

The Observatory was closed during the war and reopened after it, with Archie giving faithful service to its committee, including chairing it, for more than 30 years. Back on the island the fun continued. 21 May 1947. 'JHBM (Ian Munro) and AGSB spent some time attending the hens' feeding times in the hope of rushing the House Sparrows into the Heligoland trap. Nil return.'

14 May 1948. 'A late drive of the trap resulted in a Whitethroat and a hen being incarcerated in the box together. While AGSB picked up the hen, JHBM was able to rescue the Whitethroat undamaged. It was felt that there was no interest or scientific value in a hen brooding a Whitethroat and the light was too short to allow us to see whether the Whitethroat would brood the hen.'

Two years after the start of the Isle of May Observatory, members of the MOC were instrumental, with others, in setting up the Scottish Ornithologists' Club in 1936. Archie served the Club loyally as its Honorary Treasurer from 1946 to 1958 and as a Council member until 1963.

In 1935, he had visited Fair Isle with George Waterston and discerned its potential as a bird observatory site, even better than the Isle of May. Both of them were back there in 1946, George brooding once again about the bird observatory which actually came into being 2 years later. Archie was one of its Trustees for nearly 40 years until 1985. Nor did the repercussions of the early days of the Inverleith Field Club end there. In 1964 7 people, at least 5 of them members of the SOC, set up the Scottish Wildlife Trust.

As well as studying birds Archie had to earn a living. Following his father into the profession, he qualified as a CA in 1935 and in that year went to join his Uncle David in the family firm, Blackwood Bryson and Company, in Calcutta. He remained in India during the war, serving in the Royal Indian Navy Volunteer Reserve as a signals instructor in Bombay and as a staff officer in Delhi. There he welcomed as a guest on leave his fellow MOC member Donald Watson, knowing that he was posted to the Burma front but unable to tell him.

After the war he returned to Edinburgh, joining his father's firm, and taking over from him a place on the Boards of the Royal Blind Asylum and the Scottish National Institution for the War Blinded, where he served for some 37 years. His father was the first Auditor of the National Trust for Scotland and Archie gradually took over the Audit. His firm continued as Auditors until 1963, by which time they had held the appointment for 32 years, relinquishing it only when the growing task became too large for the resources of the firm.

Back in the voluntary sector, Archie had great sympathy for the work of the SSPCA and served on its board of Directors from 1953 to 1987. His interest in ornithology continued unabated and he was elected to the British Ornithologists' Union in 1948. He served on its committee and became its

Honorary Treasurer in 1956, continuing in that office for 20 years. The Minute of the AGM at which he retired records that he had 'meticulously, but often in new and imaginative ways, controlled and made the best possible use of the funds of the Union, which had benefited enormously from his advice and skill.'

That advice and skill characterised his whole life, to the great benefit of many individuals as well as organisations. But the cautious and perceptive precision of 'a typical Edinburgh CA' as one of his MOC colleagues described him, should be seen in the context of a warm personality full of sparkling good humour. Known as The Thresher in his young days for his dynamic enthusiasm and leadership, he put these boisterous days behind him. He became a quiet, reassuring presence, never pushing himself forward, but as an ace committee man influencing many organisations in their best interests without ever seeking the limelight for himself.

He was a passionate gardener, with a keen eye for alpenes and *Rhododendrons*. But his greatest love was for his family, his wife Eleanor and his daughter Catherine and granddaughter Mary. Archie was one of the real originals of field ornithology in Scotland, an amateur naturalist in the best sense of the term. We mourn his passing and we salute his contribution to the legacy which all of us enjoy.

John Arnott

Advice to contributors

Authors should bear in mind that only a small proportion of the *Scottish Birds* readership are scientists, and should aim to present their material concisely, interestingly and clearly. Unfamiliar technical terms and symbols should be avoided wherever possible and, if deemed essential, should be explained. Supporting statistics should be kept to a minimum. All papers and short notes are accepted on the understanding that they have not been offered for publication elsewhere and that they will be subject to editing. Papers will be acknowledged on receipt and are normally reviewed by at least 2 members of the editorial panel and, in most cases, also by an independent referee. They will normally be published in order of acceptance of fully revised manuscripts. The editor will be happy to advise authors on the preparation of papers.

Reference should be made to the most recent issues of ***Scottish Birds*** for guidance on style of presentation, use of capitals, form of references, etc. **Papers should be typed on one side of the paper only, double spaced and with wide margins and of good quality; 2 copies are required and the author should also retain one.** We are happy to accept papers on computer discs; however, please state the type of word processing programme used. Contact

Sylvia Laing on 0131 556 6042 if you wish further information on this. Headings should not be underlined, nor typed entirely in capitals. Scientific names in italics should normally follow the first text reference to each species unless all can be incorporated into a table. Names of birds should follow the official Scottish list (*Scottish Birds* 1994 Vol 17:146-159). Only single quotation marks should be used throughout. Numbers should be written as numerals except for one and the start of sentences. Avoid hyphens except where essential eg in bird names. Dates should be written:...on 5 August 1991.....but not on the 5th (if the name of the month does not follow). Please do not use headers, footers and page numbers. Please note that papers shorter than c700 words will be treated as short notes, where all references should be incorporated into the text, and not listed at the end, as in full papers.

Tables, maps and diagrams should be designed to fit either a single column or the full page width. Tables should be self explanatory and headings should be kept as simple as possible, with footnotes used to provide extra details where necessary. Each table should be on a separate sheet. Maps and diagrams should be either good quality computer print outs in black and white (please do not use greyscale shading) or in black ink and be camera ready, but drawn so as to permit reduction from their original size.

Scottish Birds

Volume 20

Part 1

September 1999

Contents

Main papers

- The breeding birds of Aukerry, Orkney, 1969-1998.
R G Adam & C J Booth 1
- The use, abuse and misuse of crow cage traps in Scotland: a report on behalf of the Scottish Raptor Study Groups and the RSPB.
D Dick & A Stronach 6
- The breeding status of the Spotted Crake in north east Scotland.
I Francis & A Thorpe 14
- Changes in the numbers and distribution of Mute Swans in the Lothians in spring from 1978 to 1998. *A W Brown & L M Brown* 18

Short notes

- Swifts nesting in Scots Pines at Abernethy Forest, Strathspey.
R Summers 27
- Size of Merlin pellets in winter and summer in Galloway.
R C Dickson 31
- Corn Bunting decline in Easter Ross. *A Watson, R L Swann, H McGhie & M Nethersole-Thompson* 34
- A further survey of Twites wintering in Caithness. *H Clark & R Sellers* 35
- Goldcrest nest sites in witches' brooms. *R Hewson & T Talbot* 37
- Goosander killing a frog. *F Gatens* 38
- Merlin's sunning behaviour in summer. *C J Rollie* 39
- Interlocking of talons between Common Buzzards. *J Towill* 40
- Pomarine Skua kleptoparasitising an inland gull roost. *C Waltho* 41
- Large Kestrel clutch sizes in south west Scotland 1997-98.
G Riddle & G Sheppard 43
- Recent fluctuations in a Common Sandpiper breeding population.
T W Dougall 44

Obituary

- Archibald G S Bryson. *J Arnott* 46

Advice to contributors

Inside back cover