

# Moulting Eiders in Orkney and Shetland

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## Introduction

In Orkney and Shetland, oil pipelines now make landfalls at two terminals where, after only little treatment, oil from North Sea oilfields is transferred to tankers for shipment to refineries (Figure 1). Hence there is potential for accidental spillage, both from ruptured pipelines and from transfer operations, and for direct harm to Common Eiders *Somateria mollissima* through oiling, or indirect effects through the contamination or destruction of their food.

The numbers of Eiders in Shetland, and their distribution there through the year,

have been studied in detail by PKK, whilst David Lea has extensive unpublished data for parts of Orkney. This paper, however, is concerned mainly with the situation in these two island groups during the period of the birds' moult when they are flightless, and hence particularly vulnerable to oil borne on the sea.

The raw data are documented in reports to the Nature Conservancy Council.

## Orkney

Some work on Eider moult flocks was

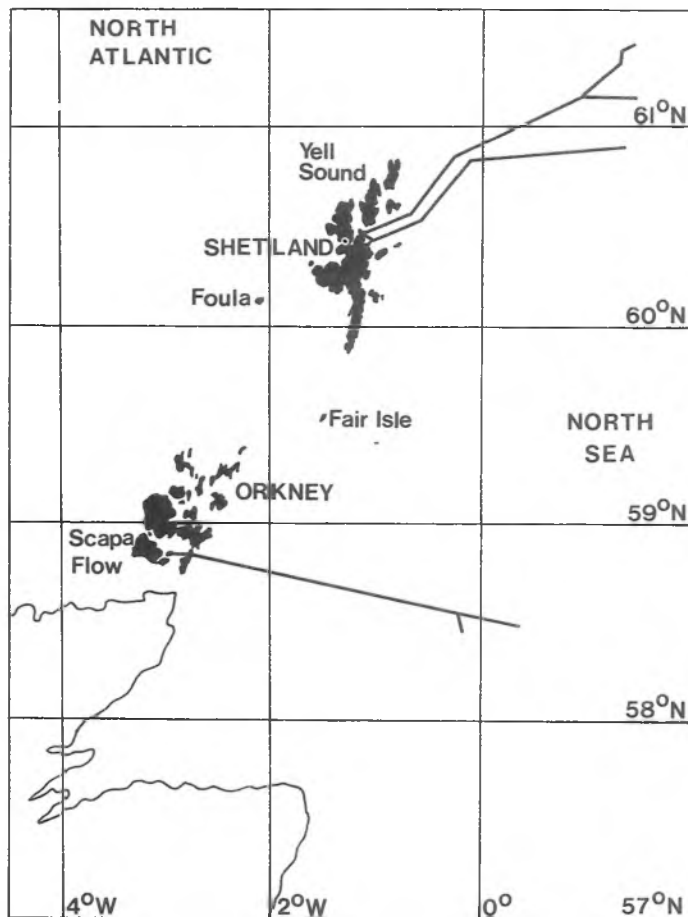


Figure 1. Location of Orkney and Shetland and of the pipelines leading in from North Sea oilfields.

carried out by PHJ in the summers of 1976 and 1977, but the coverage was far from comprehensive. In the first year a general, mainly unsystematic, survey was made by boat and aircraft, usually on scheduled trips, looking at the waters between the main islands. Inshore waters were scanned from parts of the Mainland coast. In the second year, an intensive survey was made of Eiders in Scapa Flow between Hoy Sound and Hoxa Sound: all coasts were walked except for three small islands which were circled by boat.

(a) Historical data. There was very little previous information on the behaviour or distribution of Eiders in Orkney during the moult season. Buckley and Harvie-Brown (1891) mention 'a large flock of males' present between Rousay and Mainland in 1883. These authors also quote Millais as saying that in July many Orkney male Eiders 'stay for a fortnight' in 'the great bay between Sanday and North Ronaldsay'. Local people were reported as saying that the male Eiders went out to sea in summer; PHJ found that this belief—still current—was based usually on ignorance of the males' eclipse plumage and never on direct observations of males well out to sea. (PKK found the same situation in Shetland).

(b) General surveys. In the areas searched, Eiders were distributed mainly in small parties or occasionally in larger flocks of up to 200 birds. None was found in water deeper than c. 20 m, this depth being often regarded (e.g. Driver 1974) as the normal maximum feeding limit for the species.

(c) Systematic searches, 1976. Counts along the c. 19 km of the North Ronaldsay coast produced about 82 males and 497 brown (females and immatures, but not ducklings), whilst c. 40 km of Scapa Flow coast produced about 82 males and 947 brown birds. In both areas, the birds were mainly in scattered small parties, the largest groups being of 20 and 143 respectively.

(d) Scapa Flow survey, 1977. A series of counts produced a total of 233 males and 755 brown birds; the largest flock was of 77 birds.

(e) General enquiries. The largest flocks known to local ornithologists were of c. 400 near Papa Westray and near Wyre (the latter in the same area as that noted in 1883) and of c. 300 near Copinsay. Capt. A. Alsop, during several years' experience of piloting light aircraft over Orkney islands and

waters—and with an interest in their birdlife—had never seen flocks of more than 200–300 Eiders during that time.

(f) Conclusions, Orkney. The evidence points to a pattern where Eiders in Orkney moult in flocks which may occasionally total 400 individuals, but which in the main comprise small parties of up to 20 birds and smaller numbers of flocks with up to 200 individuals. Some of the larger flocks are composed mainly of adult males, but many of the smaller flocks and parties are composed of adult males and a preponderance of brown-plumaged birds. Our information does not, of course, prove the absence of large moult-flocks of Eiders, but the regular occurrence of any such large flocks in inshore waters is unlikely.

### Shetland

PKK was able to cover much of the county's coastline in the period 1973–77. Some surveys were made from land, but proved to be much more effective from the sea. Observations were made on the moult flock at Sumburgh through the summers and autumns of 1976 and 1977.

(a) Historical data. Early writers on Shetland's birds do not specifically mention moult flocks of Eiders, but both Meinertzhagen (1941) and Perry (1948) wrote of a flock of 4–500 off Noss, whilst Venables & Venables (1955) mentioned a raft of at least 1,000 birds in a moult flock off Westerwick, Skeld.

(b) General enquiries. From local ornithologists, and also from data held by NCC and by Capt. A. Whitfield, a local aircraft pilot, it was possible to identify over twenty moulting sites, six of which had been reported to hold concentrations of more than 1,000 birds.

(c) 1975 survey. Further survey work concentrated on previously located sites rather than on systematic searches. A total of 6,900 birds was located at fifteen sites; three of these—Skeld, Sumburgh and the east isles of Whalsay—held concentrations of more than 1,000 birds, but other important areas received scant coverage.

(d) 1976 survey. Logistic difficulties and bad weather precluded survey of the northern isles, Whalsay and Out Skerries. A total of 9,000 birds was located at ten sites, and the major flock at Sumburgh was estimated to

contain up to 3,000 birds. Sites at Bressay, Skeld, Lang Ayre and Hillswick each held concentrations of over 1,000 birds.

(e) 1977 survey. All the major moulting sites were surveyed within 17 days during August. Most Eiders are flightless at this time, and since they tend to remain faithful to site, double-counting is not thought to have been a problem. A total of 13,800 birds was counted at 24 sites. Concentrations of more than 2,000 were found at Sumburgh and off the east isles of Whalsay, whilst three other sites each held over 1,000 birds. No coverage of either Foula or Fair Isle was made by PKK, but R. W. Furness (*in litt.*) and R. A. Broad (*pers. comm.*) have obtained counts of 300 and 400 respectively in recent years. An overall Shetland total of 15,500 can be adduced for 1977, this figure including birds of the year. A scatter of birds found away from the main moult sites, from previous counts and random sampling, was estimated at 1,000.

(f) Formation and dispersal of the Sumburgh flock, 1976 and 1977. In both years, parties of drakes were noted in early June. In 1976 a party of 30 was noted on 11 June, with numbers increasing to c. 2,500 by the end of that month. A count on 24 July gave an estimated 3,000 birds, with a similar number on 15 August, and on 5 September. By 12 September, a total of 2,250 suggested that several hundred had left the area, and a decline (to 750 on 17 September) continued until by 26 September only 100–150 Eiders could be found. In 1977, 622 Eiders were already assembled on 6 June; numbers had risen to 2,200 by 17 June. Because of continual human disturbance, the major part of the flock then retired to waters around Horse Island where they were usually beyond counting distance, but on 6 August an estimated 2,000 birds were still present. All but 200 had left the area by 27 September. In both years, few females had appeared in the moulting flocks before August. The Sumburgh flock remained predominantly male, though in 1977 the flocks seen off Burravoe and the east isles of Whalsay appeared to contain about equal numbers of males and brown birds. Females and young of the year were usually grouped together rather than scattered amongst the males.

(g) Conclusions, Shetland. Large flocks may often split into quite small groupings, though all remain within a discrete 'moult area'. Not every site may be in use each year: there is considerable variation in the highest

numbers present at most sites in different years, but the pattern of dispersion found in 1977 (Figure 2) was very similar to that established in 1973 from pooled data spread over about thirty years. Using all available data, Shetland moult sites can be ranked according to the numbers of birds present on one or more occasions:

numbers of Eiders	2,000+	1,000+	500+	250+	100+	50+
numbers of sites	3	5	1	8	13	5

Evidence will be presented elsewhere to show that wintering numbers are appreciably lower than this, strongly implying movement of Eiders into Shetland at the moult season and out of the islands during the winter.

### Discussion

Despite the relative paucity of information for Orkney, it is obvious that the pattern of behaviour during the Eider moult season is very different from that in Shetland: the large summer flocks which are such a feature of the Shetland population are not evident in Orkney. Shetland's late summer Eider population is estimated at 15,000, whilst Orkney's is perhaps 5,000 birds. Hence Orkney's Eiders could only form massive moult flocks if a sizeable percentage of the county's total population collected at one site. Within the relatively sheltered waters of Scapa Flow, there is not much tendency for flocking at all.

We presume that the choice of moult site will be determined by the availability of an adequate food supply, safety from predators, lack of disturbance, and probably also shelter from storms or heavy sea swell. There are insufficient data to plot areas with adequate food for Eiders; nor can we determine the Eiders' tolerance of disturbance by human activities (though it was noticeable that a certain amount of boat or aircraft movement was no deterrent). All the major Shetland moult flocks occur in localities within at most 3 km (and usually very much less) of adequate temporary protection in any direction of wind, whilst the larger of the Orkney flocks need move equally small distances for such protection. The differences between Orkney and Shetland must reflect responses of the birds to different pressures or opportunities. Perhaps Shetland's steeply shelving underwater contours allow relatively few rich feeding areas whereas Orkney's shallower seas permit more widespread feeding.

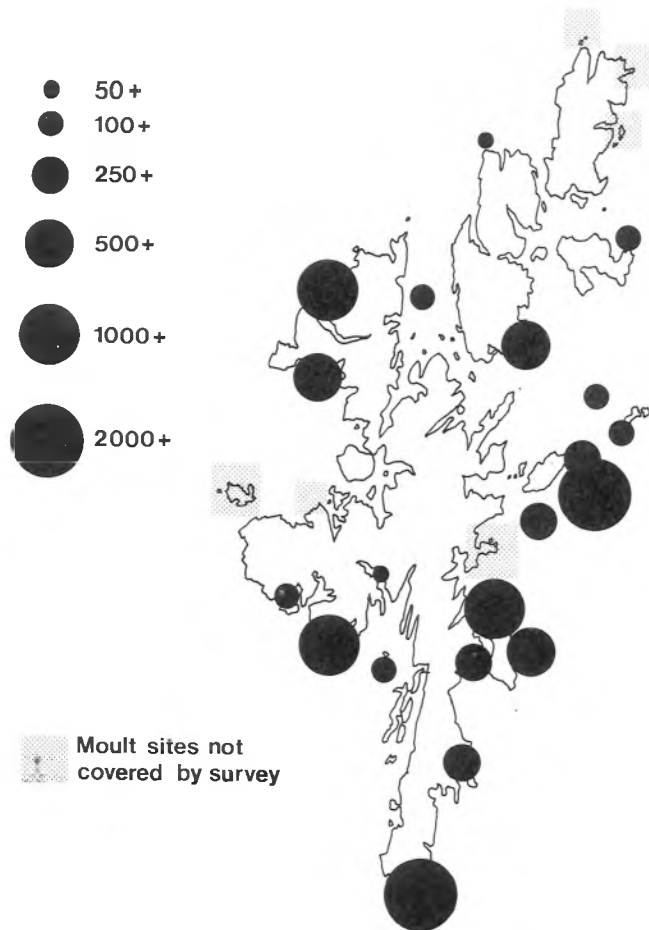


Figure 2. Eider moult concentrations located in Shetland in August 1977.

The implications of local oilspills are becoming clearer. In Orkney, the new oil pipeline terminal is situated at Flotta in Scapa Flow, and a major spillage at the site or on the tanker approach in the Flow might not have too dramatic an impact on Eiders during the moult season. Although there may be up to 1,000 Eiders flightless, or nearly so, in Scapa Flow at this time of year, they are scattered round most shores and islands, and are unlikely to be all at risk; at worst though, the destruction of the Flow's 1,000 Eiders would represent the demise of perhaps 20% of Orkney's estimated total moult population. The Eiders in Orkney's north isles are in a much less dangerous situation. In Shetland, the oil tanker approach route to the Sullom Voe terminal passes through seas holding only 200–300 moulting Eiders. The greater danger is to the large flocks on the west coast from tanker accidents, and to

those on the east coast from ruptured pipelines. In general, we conclude that Shetland's moulting, flightless, Eiders are very vulnerable in large numbers if one of the few moult flocks is caught by oil carried on the water surface, whereas Orkney's moulting birds, though more likely to be affected in small numbers by practically any significant spillage, are not so vulnerable *en masse*.

Finally, there is the intriguing possibility of a link between the Eider numbers in the two groups of islands. In Orkney, the numbers of moulting adults, particularly males, seem to be lower than the numbers of wintering birds, whereas in Shetland the reverse is the case. This could be explained if some 3,000–5,000 Eiders, mostly males, gradually moved out of Orkney each summer to moult off Shetland's Sumburgh Head. Fair Isle, roughly half way between the two, has

recorded distinct late autumn increases in Eider numbers; their origin is unknown, but these could be Orkney breeders returning home, having completed their moult off the Shetland Mainland. Their slow return, dawdling for a time at the Fair Isle, could be in contrast to a suggested rapid northern movement in June, at which time they pass the Fair Isle unobserved. The impressive moult migrations shown by Eiders in the Baltic (summarized in Salomonsen, 1968) are not made by the relatively sedentary British breeders; however, there are some local moult movements (Milne 1965), and it is possible that some Orkney birds do make an annual migration to Shetland, though the possibility of an incursion of continental birds cannot be discounted.

#### Acknowledgements

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#### Summary

During the moult season (June to September) flightless Common Eiders *Somateria mollissima* are especially vulnerable to pollution from floating oil, so their distribution and estimated numbers were assessed for Shetland and parts of Orkney. In Shetland, the late summer population in 1977 was about 15,500 birds, with five flocks over 1,000 strong; Orkney, by contrast, may have supported only about 5,000 Eiders at that time, most of them in small flocks which only rarely comprised as many as 400 individuals. The difference may be linked to food availability in sheltered sites, though this was not proved.

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#### A flock of over 800 moulting Eiders off Orkney.

