

The behaviour of wintering Smew in southern Sweden

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Introduction

The behaviour patterns of a large number of waterfowl species have been intensively studied and analysed (Johnsgard, 1965). Even so, some species, such as the Smew *Mergus albellus*, have been rather little studied in the field and published information is far from complete (Hollom, 1937; Hickling, 1957; Lebre, 1958; Richmond, 1939).

The behaviour of wintering Smew was studied in the Malmö area of the Öresund, south Sweden, in the winters 1968–1969 to 1971–1972. Displaying flocks were filmed and behaviour sequences were followed continually and registered on tape. Observations on Smew were also obtained during a general study on the winter ecology of diving ducks at the coasts of south Sweden, mainly in 1964–1965 to 1967–1968 (Nilsson, 1970a, 1972).

Study area

Malmö harbour is an important area for many waterfowl species (Nilsson, 1970b) and has the second largest concentration of wintering Smew in Sweden. Many temporary ponds and bays were formed during construction work in the harbour and they form excellent habitat for resting and wintering Smew. The water is shallow and there is a rich growth of *Zostera marina* on sandy parts and various green algae and *Fucus* on the dumped stones. The invertebrate fauna of the area is rich (Nilsson, 1972).

Habitat selection

Smew are scarce in Sweden during the winter. The total winter population in January 1971–1973 was between 300 and 500 individuals with about 90% concentrated to the two southernmost provinces (Nilsson, 1973). Here most Smew are found in two concentration areas: the Malmö harbour and the harbour of the small town Sölversborg on the south coast. Other similar areas in southernmost Sweden which freeze during hard winters are only used by small numbers of wintering Smew. Most other midwinter records are in river mouths or harbours.

Flocks of Smew arrive in south Sweden in late October and November (Nilsson, 1968)

on various lakes or in sheltered bays in the archipelagos. They do not appear in the Malmö harbour before the inland lakes freeze. Similarly, the concentration at Sölversborg is seen when the innermost bays in the nearby archipelagos freeze.

In spring, Smew leave the coastal areas with the first warm weather and are then seen on the first open water on inland lakes, staying for a short period before migrating northwards.

Sex-ratios

First-winter males of Smew are very similar to females and difficult to separate in the field under normal conditions. It is therefore more appropriate to discuss the proportion of adult males, which in south Sweden is about 50% (Table 1). Females and immatures arrive earlier than adult males. They also migrate further to the south than adult males, for Bezzel (1965) and Ehrlich (1963) found a predominance for females among wintering Smew in Germany.

In December, 54% of coastal Smew were adult males compared with 23% on inland waters but there were no differences in January to April. Food is probably more easily accessible in the shallow inland lakes and it may be an advantage for the smaller females and immatures to stay there as long as possible. In January to March, on the other hand, open water is much restricted in inland areas and the food situation similar to that on the coast.

In Goldeneye *Bucephala clangula*, differences between the sexes in local distribution and food-seeking activity indicate that the smaller females are in a more difficult situation in the winter than the males (Nilsson, 1970a, 1970c).

General activity

The daytime activity of the Smew was followed for a standard period and the activities of the birds classified into main types (Nilsson, 1970a). Observations were made on several evenings and mornings to study roosting behaviour.

Smew spend about half their day food-seeking (Table 2), the highest frequency of

Table 1. Percentage of adult males among Smew in south Sweden 1961–1973. Total numbers counted in brackets

Month	Wildfowl counts	Öresund	Lakes in Scania
Oct.	8.1(74)	—	—
Nov.	27.0(122)	—	16.2(74)
Dec.	40.3(124)	54.2(170)	22.7(119)
Jan.	55.4(670)	50.0(360)	51.4(72)
Feb.	50.0(130)	58.0(510)	47.8(44)
March	43.8(192)	50.4(514)	50.8(226)
April	49.5(133)	45.4(75)	48.0(171)

Table 2. Daytime activity of Smew in the Malmö area 1965–1972 as per cent of standard observations (i.e. the bird was followed for a standard period of time and its main activity was noted)

Month	Diving	Swimming	Flying	Preening	Sleeping	Displaying	No. of observations
Nov.–Dec.	62	11	11	12	4	—	218
Jan.	47	30	9	8	6	—	161
Feb.	49	32	5	6	8	—	210
March	45	21	3	5	18	8	428

diving being found in November to December. Red-breasted Mergansers *Mergus serrator* spend a similar amount of time food-seeking, whereas Goosanders *Mergus mergamus* spend much less, and Goldeneye much more (Nilsson, 1970a).

Smew that are not food-seeking spend their time during the day in moving around, preening or, a few only, in sleeping. The same was true of the Red-breasted Merganser, whereas 50% or more of Goosanders sleep and rest for long periods.

During the day individual Smew feed actively for periods of about 20–30 minutes, then the intensity decreases. The birds make longer pauses between the dives and finally start preening. The bouts of preening generally last about 3–5 minutes, sometimes longer. They mostly preen on the water but in midwinter often do so sitting on the edge of the ice. After preening they rest for some time either swimming around quietly or sleeping on the water or ice before starting to dive again.

Smew often stay in loose groups during daytime feeding. When diving these groups often separate but as the birds stop to preen and rest the flock reassembles.

In midwinter little difference in activity could be found through the day. In late winter and early spring, on the other hand, Smew often feed less during the afternoon and stop entirely 1 hour or more before sunset.

In most winters the Smew spend the night in their daytime haunts roosting in small flocks on the water or ice edge. In March 1969, however, when the species was unusually common, they had a communal roost in a sheltered bay of the harbour. The roost was situated about 0.5–1 km from the main daytime areas. The Smew in general stopped feeding at least 1 hour before sunset and gathered into groups with much preening and intense display. At sunset small parties left and flew to the roost. There they stayed in a dense flock, still with much preening and display. As it grew darker the birds gradually adopted the sleeping position, but new arrivals caused sleeping birds to display again. Sometimes very intense display was seen till it was almost completely dark. The Smew left the roost before or at sunrise and dispersed over the feeding grounds in small groups or in pairs. This bay has for many years been a traditional roosting site for Goldeneye, which had the same time-schedule and behaviour as the Smew, but the Smew used a different part of the bay. The behaviour in the smaller flocks in other years was the same as in the communal roost.

Feeding

Smew obtained all their food by diving in shallow water, in depths of less than 2 m. The

range in diving time of 114 dives was 8–31 seconds with a mean of 18.2 ± 2.3 seconds. As in the Goldeneye (Nilsson, 1969) the dives of paired Smew were synchronized.

Co-operative feeding was not seen, probably because the flocks are small. In the Netherlands a large flock were seen feeding co-operatively in January 1968 (Källander *et al.*, 1970).

The actual food choice of Smew in the study areas could not be ascertained, though in some cases small fishes were brought to the surface. A female killed in a fishing net in an inland lake was filled with larvae of caddisflies *Trichoptera*.

Feeding Smew were regularly accompanied by gulls, mostly Black-headed Gulls *Larus ridibundus*, but also Herring Gulls *Larus argentatus*. Black-headed Gulls regularly followed a diving Smew, often waiting on the water nearby, but hovering above when it surfaced. In general they did not harass the Smew but sometimes, when they tried to snatch food from a Smew, it would make a short rush to avoid the gull. In some cases, watching Black-headed Gulls picked food-items from the surface. Herring Gulls behaved in a similar way. Once a Herring Gull was seen pursuing a male Smew which flew for about 200 m. Then the Smew alighted, the gull attacked, and the Smew flew away followed by the gull. Red-breasted Mergansers and Goosanders were regularly harassed by gulls when feeding (Nilsson, 1965, 1966).

Pair-formation

No pairs were seen before February (Table 3); by March and April about one third of the Smew were paired.

In Schleswig-Holstine, Sudhaus (1966) found few pairs in December and January, whereas pairs were common in February, the peak number being in March. In southern Germany, Bezzel (1965) saw almost no pairs in December and January, whereas about 30% of the females were paired in February and about 40% in March and April.

A male Smew and a female Goldeneye were once observed behaving as a pair on a small lake. Wild hybrids between the two species have occasionally been found (Angel & Neuendorf, 1963).

Antagonistic behaviour

Aggressive behaviour is mainly seen in courtship parties, only rarely between single pairs or individuals. Fighting for food, common in the Goosander in the winter (Nilsson, 1966), was only seen once. A female came up after a dive with an eel in her bill. A nearby male attacked, the female flew about 100 m followed by the male. Then she managed to swallow the fish and the male left her alone.

Smew have two types of attack: swimming attack in which the bird rushes for up to 2–3 m against its antagonist with the head thrust forward, and diving attack in which it approaches under water. Diving attack was only seen on a few occasions and is not so common as in the Red-breasted Merganser or, especially, the Goldeneye. In the Red-breasted Merganser and Goosander a *wild chase* occurs in which the pursuer follows its antagonist on the surface, both rushing with the wings beating against the surface until they are quite exhausted (Nilsson, 1965, 1966). This was not seen in the Smew.

In the display parties Smew show much aggressiveness, jabbing at others with the bill. This is also the commonest form in the female which only rarely performs proper attacks.

Paired males often defend their females, making repeated swimming-attacks against intruding males, chasing them a few metres away and then rejoining the female. The intruder often returns, to be chased away again.

Communal courtship

The display postures have been detailed by Hollom (1937), Johnsgard (1965) and Lebreton (1958), so the present treatment will be re-

Table 3. The percentage of paired males and females among Smews in the Malmö area 1965–1972

Month	Total numbers counted	Per cent ad. males	Per cent paired	
			Males	Females
Jan.	210	49	0	0
Feb.	218	54	7	8
March	449	48	28	26
April	112	47	36	32

stricted to some general observations of Smew courtship in the field.

Courtship was noted in flocks of from eight males and four females down to two males and one female. Usually two to seven males displayed around one or two females. Display in larger flocks generally divided into several groups centred around active females. The display parties rarely had the same number of birds for long, but an active nucleus remained.

The first communal courtship was seen in late January but intense display not until late February or early March. The intensity decreased as more birds paired and was rather low in April. Display was infrequent in the morning and rare at midday. In general it was most intense in the afternoon and when the birds gathered to roost.

Courtship display in Smew could be spontaneous but was generally initiated by: (1) a male or female flying to an inactive flock; (2) a male swimming to a flock; (3) two pairs or a pair and a single male meeting; (4) various external disturbances.

During the period of most intense display about three-quarters of all meetings as in (3) led to display. An intruding male was often met by the male of the pair with aggressive behaviour and display postures. The intruding male also performed some display. In many cases such meetings led to the formation of a display party of several males and one or a few females.

The intensity of the display varied with the circumstances and the time since the last bout. Sometimes only few postures will be shown, in other cases the display will last for many minutes. During the most intense period of display males in the flocks remain *intent* almost all the time, making some display movements during diving pauses. Only

a slight stimulus will be needed to start intense display of long duration.

Displaying males will generally group around more or less active females, but sometimes during the height of display, they will pursue inactive females for a long time. Typically a female swims ahead of a group of up to four or five *intent* males that follow close behind her making repeated display movements. Suddenly a male in the rear takes to the wing and flies towards the female, who dives, as do one or more males. When the female returns to the surface, the males fly or rush towards her again, leading to a new escape dive of the female. This may be repeated many times until the female finally takes to the wing pursued by the males. She continually tries to avoid the males, but they follow her and suddenly the group settles on the water only to continue the pursuit there. Sometimes the female and one or two of the males dive direct from the wing and continue under water. Chases of this type will often continue, with short pauses, for up to half an hour. They were generally seen when many of the adult females were already paired.

Copulations were sometimes initiated in a pair that had just left a display party, in other cases when they had just stopped diving. Once copulation started after an external disturbance. The first copulations were seen in the last days of February, i.e. when the main display period started. In other areas, however, copulations were seen from January onwards (Bauer & Glutz, 1969).

Summary

The general, feeding, agonistic and sexual behaviour of wintering Smew *Mergus albellus* in southern Sweden is described, together with related aspects of habitat selection and sex ratios.

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A male Smew *Mergus albellus* crest-raising.

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