

A note on killer whales (*Orcinus orca*) near Solvær, Norway in November–December, 1984

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ABSTRACT

Two pods of killer whales (*Orcinus orca*) near Solvær, Vestfjorden, Norway, totalling about 40–50 individuals, were photographed and vocalizations of one pod recorded over four days in November/December 1984. A catalogue was made containing 27 animals tentatively photoidentified. One recognizable animal first photoidentified in September 1983 near Solvær was reidentified in September 1986 in that same area. Following periods during which the whales were apparently feeding on schools of herring (*Clupea harengus*) in shallow water, many dead fish were found on the bottom. Similar observations by fishermen, the killer whale's potential to scare herring and occasional entanglement of killer whales in inshore fishing gear are cited as reasons why some local fishermen are antagonistic toward these whales.

INTRODUCTION

Killer whales (*Orcinus orca*) are present along the Norwegian coast throughout the year, with appreciable concentrations along the southwest coast, near Møre and Svolvær, Vestfjorden (Christensen 1982). They feed at least partially on herring (*Clupea harengus*) (Jonsgård and Lyshoel 1970; Christensen 1982; Arnbom 1985), sometimes driving schools into shallow bays and/or to the surface (Christensen 1982, 1988 – this volume; Øien 1988 – this volume) as has been observed elsewhere (Steiner *et al.* 1979). Some inshore fishermen have voiced concern that feeding on herring by killer whales may slow or arrest recovery of the Atlanto-Scandian herring stock (Christensen 1984). The present note reports on studies made in 1984 on killer whales in coastal Norwegian waters where it is attempted to elucidate some aspects of the alleged killer whale/man interactions.

METHODS

From 28 November – 3 December, 1984, killer whales were searched for from a 5 m motor boat in waters between Svolvær and Store Molla in Vestfjorden, North-Norway (68°15'N, 14°44'E) (Fig. 1). Identification of individuals and pods of whales was attempted by photography and sound recording. Daylight duration of only about an hour at this time of year required that individual identification photographs be made with minor modifications to techniques earlier described (Bigg 1982; Bigg *et al.* 1986, 1987), i.e. use of a 35 mm camera, 1600 ASA film and a 100 mm lens. Vocalizations for identification of pods (see Ford and Fisher 1983) were recorded using a Gould CK-17U hydrophone and a Uher 4400 IC Report Stereo operated at 19 cm/sec. The system's frequency response was flat (+/- 5 dB) from 20Hz – 20kHz. Voice reports of behavioural and environmental data

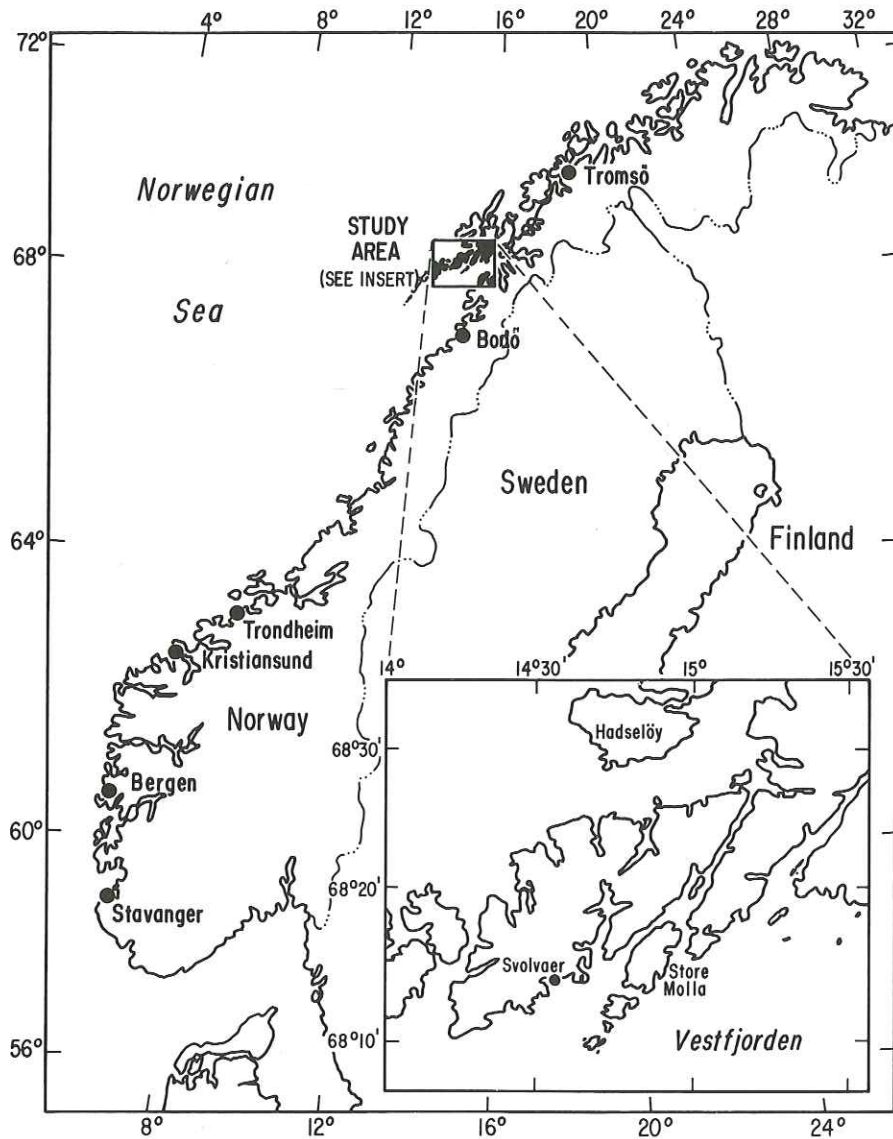


Fig. 1. The coast of Norway, showing the area in which observations of killer whales were conducted November/December 1984.

were made on the second channel of the recorder.

Killer whales were encountered on 30 November and 1–3 December. Before daylight, we went to the locality where we expected to find killer whales and attempt to locate a pod by sound. We then positioned our boat so that wind and current would direct us toward the pod. This assured that by daylight, we would be in close proximity to the animals.

If the whales moved away from the boat we searched underwater with Scuba masks and snorkels to determine bait conditions and estimated the density of dead herring which were apparently left from feeding killer whales in the area of the bottom directly under the boat (about 10 m²).

During the study period, we spent long periods of time discussing killer whales with local fishermen to determine their attitudes.

RESULTS

Killer whales were usually found within several minutes of leaving the harbor at Svolvær. Groups were typically small (3–20 animals) but frequently joined to form larger aggregations. From photographs we tentatively photoidentified 27 individuals and determined that we encountered only two large pods totaling about 40–50 animals in the area. The two pods were resighted many times during the five days.

Photographs of individuals were compared to those collected by Lyrholm (1988 – this volume). One match was obtained. A subadult male or female we photoidentified had been originally photoidentified near Svolvær in September, 1983; it was reidentified there in September, 1986.

About two hours of recordings of vocalizations were obtained of one pod. These were compared with recordings made off Iceland (see Moore *et al.* 1988 – this volume).

The whales appeared to be feeding on herring. When whales departed from an area we observed schools of herring swimming in the shallow water and often observed dead herring on the bottom. The dead fish were whole and did not typically appear marked or disfigured. Density of dead herring on the bottom in four instances were 0.95, 1.4, 0.35 and 0.55 fish per m², respectively. The total bottom area in which we found dead herring varied widely from several hundreds to several thousands m². Occasionally, white-tailed eagles (*Haliaeetus albicilla*) were seen swooping to the water and retrieving herring in the vicinity of circling whales. Great black-back gulls (*Larus marinus*) were also observed on several occasions with eagles feeding on material, probably wounded herring, at the surface in the same area where the whales had just ceased feeding.

Local fishermen expressed dislike of the whales and concern about the increasing number seen in the Vestfjorden area. One instance of a killer whale entrapped in fishing gear was reported, along with "standing-by"

behaviour by the pod of whales. Typically, fishermen expressed concern about the amount of herring eaten and the number of fish destroyed but not eaten.

DISCUSSION

Judging from responses to questionnaires (Christensen 1982, 1988 – this volume) and whaling and sightings records (Øien 1988 – this volume) killer whales occur throughout the year all along the Norwegian coast, with concentrations on the southern west coast in Møre, in Lofoten and Finnmark. Our observations confirm their occurrence in winter in Vestfjorden and confirm that at least 40–50 animals are present there, at least at times during the winter. Given the limited observations, no estimate of the size of the winter population is possible. Fishermen near Svolvær report that the largest numbers of killer whales occur there in late October and early November.

Matches of an individual photoidentified in this study with photos taken in September, 1983 and 1986 (see also Lyrholm 1988 – this volume) indicate that the pods seen in the Lofoten region may traditionally reside in that area, at least throughout the fall and winter. Some pods of the Norwegian coastal population of killer whales may exhibit area fidelity or residence behaviour of the sort discussed by Bigg (1982) and Ford and Fisher (1983).

Comparison of killer whales photoidentified in this study with animals photoidentified off Iceland is reported by Lyrholm *et al.* (1987) and by Sigurjónsson *et al.* (1988 – this volume). No killer whales identified off Norway have been reidentified off Iceland or vice versa.

Following the whales' feeding periods, dead herring were commonly observed. Although finding dead herring on the bottom in such numbers was not observed apart from areas where killer whales were feeding, we cannot be certain that there were not some dead herring on the bottom before the whales began feeding nor that the feeding behaviour of the whales caused the death of the fish. Even if

herring were destroyed by the whale feeding, it is not believed that killer whales, at present, have a serious impact on the Atlanto-Scandinavian herring stock (Sigurjónsson in press). However, such observations provide local in-shore fishermen with some basis for their views regarding the effect of killer whale predation on herring recovery and cause them to argue for reduction of killer whale stocks in the area. Some of their feelings toward the whale may be influenced by loss of access to the whale as a resource because whaling for killer whales ceased in 1982 (Christensen 1982). Additionally, because of the tendency of the whale to closely approach fishing boats, many fishermen fear them.

Continued study, especially based on photoidentification of individuals, is required to determine population size, abundance and

movements of the killer whales along Norway's coast. Additionally, study of the attitudes of local fishermen toward the whale may be necessary to satisfactorily elucidate conflict which may exist between the whale and fishermen.

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REFERENCES

- Arnbom, T. 1985. Birds feeding in association with orcas. *The Osprey* 16 (2): 162-163.
- Bigg, M. 1982. An assessment of killer whale (*Orcinus orca*) stocks off Vancouver Island, British Columbia. *Rep. int. Whal. Commn* 32: 655-666.
- , G. M. Ellis and K. C. Balcomb 1986. The photographic identification of individual cetaceans. *Whalewatcher* 20 (2): 10-12.
- , G. M. Ellis, J. K. B. Ford and K. C. Balcomb 1987. Killer Whales: A study of their identification, genealogy and natural history in British Columbia and Washington State. Phantom Press Publishers, Nanaimo, British Columbia, 79 pp.
- Christensen, I. 1982. Killer whales in Norwegian coastal waters. *Rep. int. Whal. Commn* 32: 633-642.
- 1984. Growth and reproduction of killer whales, *Orcinus orca*, in Norwegian coastal waters. *Rep. int. Whal. Commn (Special Issue No. 6)*: 253-258.
- 1988. Distribution, movements and abundance of killer whales (*Orcinus orca*) in Norwegian coastal waters, 1982-1987, based on questionnaire surveys. *Rit Fiskideildar* 11: 79-88.
- Ford, J. K. B. and H. D. Fisher 1983. Group-specific dialects of killer whales (*Orcinus orca*) in British Columbia. *In* R. Payne (Ed.), *Communication and behavior of whales*. Westview Press, Boulder, Colorado, pp. 129-162.
- Jonsgård, Å. and P. B. Lyshoel 1970. A contribution to the knowledge of the biology of the killer whale *Orcinus orca* (L.). *Nytt Magasin Zoologi* 18: 41-48.
- Lyrholm, T. 1988. Photoidentification of individual killer whales, *Orcinus orca*, off the coast of Norway, 1983-1986. *Rit Fiskideildar* 11: 89-94.
- , S. Leatherwood and J. Sigurjónsson 1987. Photoidentification of killer whales (*Orcinus orca*) off Iceland, October 1985. *Cetology* 52: 1-14.
- Moore S., J. Francine, A. E. Bowles and J. K. B. Ford 1988. Analysis of calls of killer whales, *Orcinus orca*, from Iceland and Norway. *Rit Fiskideildar* 11: 225-250.
- Sigurjónsson, J. In press. Killer whales, *Orcinus orca*, in European waters. *In* R. Duguay and D. Robineau (Eds.), *Säugetiere Europas*.
- , T. Lyrholm, S. Leatherwood, E. Jónsson and G. Víkingsson 1988. Photoidentification of killer whales, *Orcinus orca*, off Iceland, 1981 through 1986. *Rit Fiskideildar* 11: 99-114.
- Steiner, W. W., J. H. Hain, H. E. Winn and P. J. Perkins 1979. Vocalizations and feeding behaviour of the killer whale (*Orcinus orca*). *J. Mamm.* 60 (4): 823-827.
- Øien, N. 1988. The distribution of killer whales (*Orcinus orca*) in the North Atlantic based on Norwegian catches, 1938-1981, and incidental sightings, 1967-1987. *Rit Fiskideildar* 11: 65-78.