

Recoveries of Grey Seals *Halichoerus grypus* (Fabricius) tagged along the Norwegian coast

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A total of 1040 Grey Seals have been tagged along the Norwegian coast in the period from 1975 to 1986. Most of them (985) have been tagged at Froan on the coast of Sør-Trøndelag. Ninetythree of the tagged seals have been recovered. The majority of these (62) have been found dead on land or in fishing gears during their first year of life, and the total recovery rate during the first year is 6.3%. The pups disperse widely. The furthest dispersals recorded on the Norwegian coast during the first year after tagging have been 380 km to the south and 320 km to the north of Froan. In addition, one pup tagged at Froan was recovered 82 days later on the northwestern coast of Denmark. Most of the recoveries are, however, recorded less than 100 km from the tagging locality.

Nine mature seals have been recovered during the breeding season. Five of these have been caught at their place of birth and the other four have been caught 20 to 80 km away. It is concluded that there are no data implying that the Froan stock of Grey Seals is recruiting other breeding stocks on the Norwegian coast.

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INTRODUCTION

A study of coastal seals and their interactions with inshore fisheries along the Norwegian coast from Stad (about 62°N) to Lofoten (about 68°N) was initiated by the Institute of Marine Research in 1974. The study has later been extended to the entire Norwegian coast. As a part of this study tagging experiments have been performed with both Grey Seals, *Halichoerus grypus* (Fabricius), and Common Seals, *Phoca vitulina* L., in order to study migration and to verify age determination methods.

Up to the year 1986 a total of 1040 Grey Seal pups have been tagged on the Norwegian coast, most of them at Froan in Sør-Trøndelag county (Fig. 1).

Many of the seals have been recovered. A review of these recoveries is given here and their significance is discussed.

METHODS

During the first 3–4 weeks of life the Grey Seal pups spend most of the time on land and are easy to catch. The pups are tagged with a yellow plastic tag in the web of the hind flip-

pers. All tags applied have been of the Dalton Jumbo Rototag type. However, in 1979 some seals were double tagged with «Allflex» in the other flipper to study tag losses. Each tag has a serial number and «HAVFORSKNING BERGEN NORW» imprinted.

As seen from Table 1 most of the taggings (985) have been performed at Froan in Sør-Trøndelag. In addition, Grey Seal pups have been tagged at Fuglevær (23) and Floholmene (24) in Nordland and Kamøy (7) and Reinøy (1) in Finnmark.

An award is paid by the Institute of Marine Research for every recovery reported.

RESULTS

A total of 93 seals have been recovered. Fiftyeight of these were recovered in fishing gears during the first eight months of life (Table 2, Fig. 2). The total recovery rate during the first year of life is 6.3% (Table 1). Most of these recoveries are from gillnets down to 130 meters. Ten seals have been recovered four to eight years after tagging.

The seals tagged at Froan have been recovered on the Norwegian coast between Florø in Sogn og Fjordane in the south and

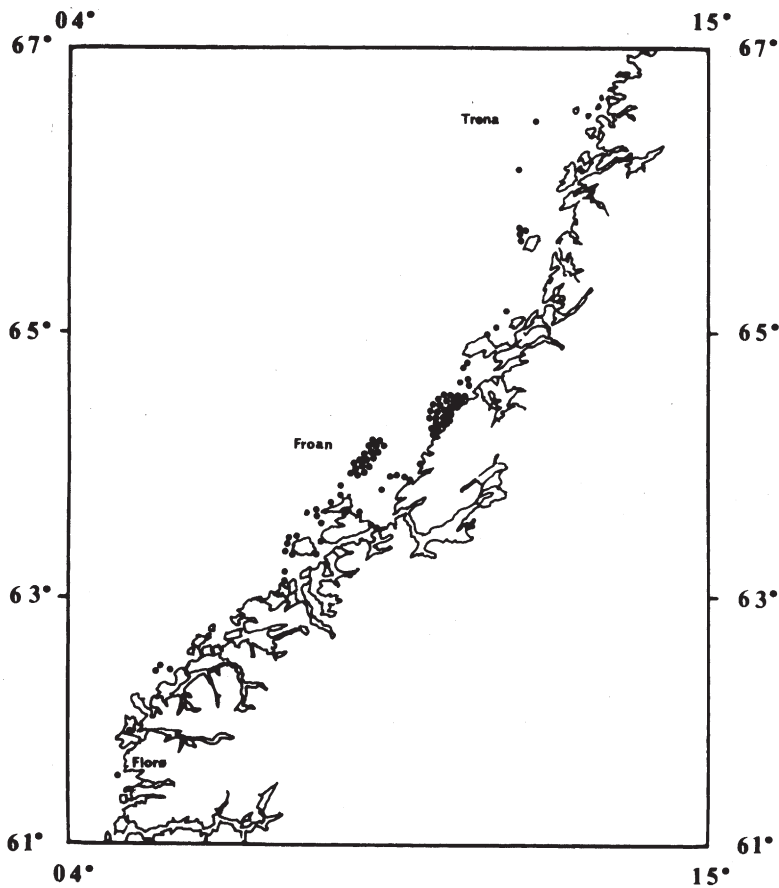


Fig. 1. Recoveries of Grey Seals *Halichoerus grypus* tagged at Froan, Norway.

Table 1. Grey Seals *Halichoerus grypus* tagged along the Norwegian coast from 1975 to 1986 and number of recoveries.

Locality	Date	Number tagged	Total	Number recovered Yearlings	%
Fuglevær	9.-15.10.75	23	2	1	4.3
Floholmene	25.10.76	24	3	1	4.2
Froan	21.9.-9.10.77	99	14	9	9.1
Froan	4.-13.10.78	88	8	6	6.8
Froan	6.-25.10.79	166	20	13	7.8
Froan	5.11.82	14	2	2	14.3
Kamøyene	16.11.82	7	1*	1	14.3
Froan	11.-13.10.83	175	14	10	5.7
Froan	30.9.-15.10.84	34	3	2	5.9
Reinøya	10.01.85	1	0	0	-
Froan	26.9.-16.10.85	192	14	8**	4.2
Froan	26.9.-3.11.86	217	12	12	5.5
Totalt		1040	93	66	6.3

* Scientific catch.

** Five tagged pups culled at the breeding locality shortly after tagging are not incorporated.

Table 2. Recovery status in relation to age of Grey Seal *Halichoerus grypus* along the Norwegian coast.

	Age classes									
	0	1	2	3	4	5	6	7	8	
No information	2									
Found dead	4									
Dead in fishing gears	58	5	1	2	1					
Culling	5	2		1	1	3	1	2	2	
Scientific catch	1									
Total	71	7	1	3	2	3	1	2	2	

Table 3. Recovery of mature Grey Seals *Halichoerus grypus* along the Norwegian coast.

No	Sex	Tagging locality	Recovery locality	Distance (km)	Age
D0227	F	Fuglevær	Torget	40	4
D0657	F	Froan	Froan	0	7
D0681	M	Froan	Melsteinen	25	5
D0694	M	Froan	Melsteinen	25	5
D1114	F	Froan	Froan	0	7
D1301	F	Floholmene	Myken	80	8
D1320	F	Floholmene	Floholmene	0	8
D2737	M	Froan	Froan	0	6
D2857	F	Froan	Froan	0	5

Træna in Nordland in the north (Fig. 1). This is about 380 km and 320 km away from the tagging locality, respectively. In addition, one pup tagged at Froan in 1986 was recovered 82 days later at the northwestern coast of Denmark.

Six of the tagged Grey Seals from Froan have been recovered as mature animals (Table 3). Of these 2 five-year-old males have been recovered at Melsteinen, 10 km east of Froan. The remaining three females and one male have been recovered at Froan proper.

Two of the seals tagged at Fuglevær in Nordland were recovered less than 40 km from the tagging locality. One of these was a mature female.

Three of the seals tagged at Floholmene have been recovered. Two of these were eight-year-old females, one recovered at Myken about 80 km to the north and the other recovered near the tagging locality.

All of the eight recoveries of seals tagged at

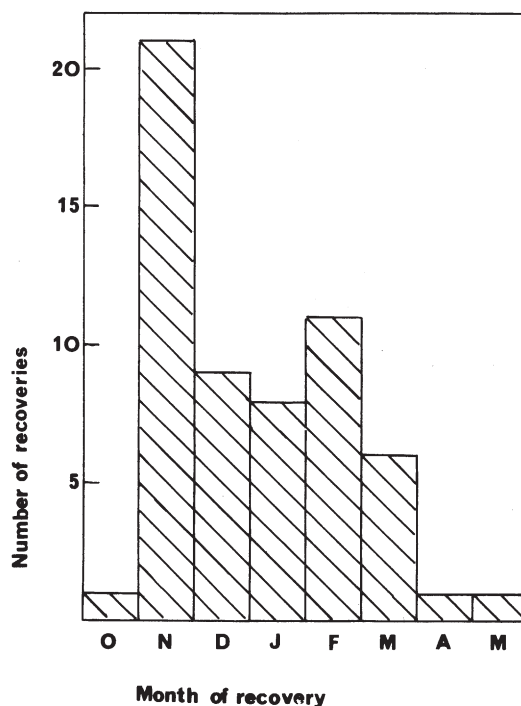


Fig. 2. Monthly recovery during the first year of life of Grey Seals *Halichoerus grypus* tagged along the Norwegian coast.

Froan in 1978 were tagged with both «Rototag» and «Allflex». Six of these were recovered during the first two months after tagging with both tags left. One seal was recovered with both tags after one year, while a seven-year-old seal had only the «Allflex» left.

DISCUSSION

According to investigations in the British Isles, the Grey Seal does not stay at the breeding site the whole year round. After the breeding season most disappear and do not return until the next breeding season. In the mean time they have gathered for moulting during the spring (Hewer 1974). Few Grey Seals are usually seen at Froan outside the breeding season (B. Gården, pers. comm.). This is also the situation recorded in Rogaland where most of the seals have been seen during the winter and spring (Wiig 1987).

The Grey Seal pups disperse widely after weaning (e.g. Hewer, 1974). Since tagging of

Grey Seals in Great Britain was initiated in 1951, a total of 61 seals tagged there have been recovered in Norwegian coastal waters until 1982 (Bjørge & McConnell 1986). The dispersal might be very fast. A pup tagged at Isle of May in Scotland was recovered nine days later at Karmøy in Rogaland about 580 km away.

According to Hickling, Rasmussen & Smith (1962) and Hewer (1964) the long distance dispersal from the British breeding grounds to the Norwegian coast is probably caused by wind.

Grey Seal pups tagged at Froan have been recovered over a large area, but most of them have been recovered within a radius of 100 km from the tagging locality. Most of the recoveries have been made in fishing gears. The fishing effort will, therefore, strongly influence the rate of recovery. We have, however, no information on this effort. About half of the recoveries have been made on a relatively narrow part of the coast northeast of Froan. This might be due to special weather conditions. According to Øynes (1964) many Grey Seal pups from Froan come ashore in this area when strong westerly winds dominate.

The total rate of recovery is 6.3% during the first year of life, which corresponds to British results (Hewer 1974). The annual recovery rate is dependent on the proportion of pups tagged on a locality in relation to total production. The number of untagged pups found dead or taken in fishing gears is unknown, thus total pup production in Froan can not be estimated by these mark-recovery experiments.

From British studies there is no evidence that the pups which disperse most widely (e.g. to the Norwegian coast) return to their place of birth in order to breed. According to Bjørge & McConnell (1986) the immigration from Great Britain to the Norwegian coast was on average 650 Grey Seal pups a year in the period 1960—1981. This corresponds to the pup production in a stock of about 2500 Grey Seals, which is more than 75% of the minimum estimate of the total Norwegian stock (according to the figures of Wiig 1986). There is, however, no information suggesting that British Grey Seals are recruiting to Norwegian breeding stocks, or are establishing new breeding colonies on the Norwegian coast (Bjørge & McConnell 1986, Wiig 1986). It is therefore assumed that they return to the British coast (Wiig 1987).

The number of recovered mature Grey Seals tagged at the Norwegian coast is small,

but they indicate that these seals return to breed at the area where they were born. In several culling programs of Grey Seals in the period 1980 to 1986, 817 Grey Seals have been culled mostly in the breeding season in the area from Froan to Lofoten. All of the nine recovered mature seals were taken relatively near their birth place (Table 3). Thus from the present figures there is no indication that the Grey Seal colony at Froan is recruiting to other colonies along the Norwegian coast. Some mixing between the stocks is, however, probably occurring. This has been verified in Britain (Harwood *et al.* 1976) and in Canada (Mansfield & Beck 1977).

British studies have indicated that tag loss rates may be increasing with tag age. The increase was, however, not found to be significant (McConnell *et al.* 1984). The recovery rate of older seals in the present study is so far too low to say anything about tag losses.

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