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TAGGING AND RECOVERIES OF GREY SEALS *HALICHOERUS GRYPUS* IN NORTH NORWAY AND ON THE MURMAN COAST, RUSSIA.

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ABSTRACT

A total of 787 grey seal pups were tagged between Vestfjorden in North Norway and the White Sea in North West Russia from 1989 to 1994. A majority of them (542) were tagged at the Ainov archipelago on the Murman coast. Thirty-six (4.6 %) of the tagged seals were recovered, almost all taken as bycatches in fishing gear. Thirty-three of the recaptures were made during the first seven months after tagging. Of the remaining three, two were in their second year, and one in its third year. The pups seem to disperse considerably. Ten pups were recovered less than 100 km from the tagging site, 8 pups between 100 and 200 km and 15 pups more than 400 km from the tagging site. Two pups tagged at Seven Islands in Russia 21 November 1994, were recovered in Norway on 1 March and 10 April 1995 respectively. The first one in Lyngen (Troms county) 790 km from the tagging site, and the second one outside Myre (Nordland county) 1010 km from the tagging site. The pups may disperse both east- and westwards. The lack of recoveries from the Russian coast are most likely due to the lack of coastal fisheries and hunting of grey seals in the area.

INTRODUCTION

In the North Atlantic there are three main groups of grey seals, *Halichoerus grypus*, centered in the Baltic Sea, the eastern North Atlantic and the western North Atlantic (Bonner 1981). Observations made in the Northwest Atlantic seem to indicate that grey seals have a strong philopatry to their whelping sites, but considerable dispersion is assumed to occur in distribution outside the breeding season (Stobo et al. 1990, Lavigueur & Hammill 1993). Little is known about the movements of adults (McConnell et al. 1992), but recoveries suggest that there is a general dispersal of grey seal pups away from their natal sites (Hewer 1974, Baker 1978, Bjørge & McConnell 1986, Wiig & Øien 1987, McConnell et al. 1992). Observed migration rates between areas have indicated that most of 0+ age groups of seals remain within the sea area closest to their natal site, but that extensive movements occur between adjacent areas, with consequent mixing of pups from different breeding sites.

In a proposal for a new management regime for grey seals in Norwegian coastal waters, the species was divided into several management stocks (Anon 1990). However, questions concerning identity and possible migration between these hypothetical stocks were unresolved, and it was evident that further studies were necessary. Therefore, as part of a study of coastal seals and their interactions with inshore fisheries along the Norwegian coast from Stadt (about 62°N) to Lofoten, grey seal pups were tagged systematically in Central Norway during the period 1975 - 1986 (Wiig 1986, Wiig & Øien 1987). The purpose of these taggings was to study migrations and to verify age determinations. From the late 1980's, the geographical

range of Norwegian coastal seal investigations, also including tagging, was extended to include the entire Norwegian coast (Wiig 1986, 1987, 1988, 1989). These taggings of grey seals were performed from Lofoten to Finnmark in 1989 - 1994. Cooperation with Russian scientists also made it feasible to conduct taggings in large grey seal colonies on the Murman coast (Karpovitch et al. 1967, Haug et al. 1994) in 1991, 1992 and 1994. The purpose of this paper is to present information on recaptures (to 31 December 1995) from this most recent tagging experiment in North Norway and Russia.

MATERIAL AND METHODS

During their first 3 - 4 weeks of life, grey seal pups spend most of their time onshore and are therefore easily captured for tagging purposes. The pups were tagged with yellow PVC «Dalton Jumbo Rototags» in the web of one of the hind flippers. Each tag had a serial number and «HAVFORSKNING BERGEN NORW» imprinted. A few pups on the Murman coast were tagged with red Russian VNIRO tags bearing the text «SU 184631 MURMANSK R. MMBI» in addition to individual numbers. The taggings were performed during the period 1989 - 1994 (Table 1) at four localities in northern Norway (175 pups tagged, with 22 at Røst, 34 at Mosken, 70 at Kamøy and 49 at Kongsfjord) and two localities in Russia (612 pups tagged, with 542 at Ainov and 70 at Seven Islands) (Fig 1 and 2). Recoveries from the taggings with Norwegian tags were recorded in files at the Institute of Marine Research, Bergen, Norway, and an award was paid by the Institute of Marine Research for every recovery reported.

RESULTS

Of the 787 grey seal pups tagged from Lofoten in North Norway to The White Sea in North West Russia from 1989 to 1994 (Fig 1 and 2), a majority (542) were tagged at the Ainov archipelago on the Murman coast. Thirty-six (4.6 %) of the tagged seals were recovered by 31 December 1995 (Table 1), almost all taken as bycatches in fishing gear. The majority of these recaptures (33) were made during the first year after tagging, in fact, within seven months after the taggings (Table 2). Of the remainder, two were recaptured in their second year and one in its third year (Table 1). Pups were recovered both east- and westwards from the tagging sites, and only two recaptures (one at Kamøy, Norway, and one at Ainov, Russia) were made in the areas where the seals had been tagged (Figs. 1 and 2). Ten pups were recovered less than 100 km from the tagging sites, eight pups between 100 and 200 km and 15 pups more than 300 km from the tagging sites (Tables 3 and 4). Two extremely migrant pups, tagged at Seven Islands in Russia on 21 November 1994, were recaptured on 1 March 1995 in Lyngen (Troms county, Norway), 790 km from the tagging site, and on 10 April 1995 off Myre (Nordland county, Norway), 1010 km from the tagging site (Table 3, Fig. 2).

DISCUSSION

Considerable dispersal of grey seal pups from their natal rookeries is well documented in previous studies (e.g. Hickling et al. 1962, Campbell 1966, Hewer 1974, Bjørge & McConnell 1986, Wiig & Øien 1987), and also confirmed in this study. In their

tagging experiment in mid Norway, Wiig & Øien (1987) reported recaptures over a relatively large area, but most of them within a radius of 100 km from the tagging localities. The present results from North Norway and Russia appear to be very similar to this. Recoveries of grey seals tagged on the Murman coast in Russia, suggest a considerable dispersal of pups from these breeding colonies to North Norway.

Potential dispersal on the Murman coast is impossible to ascertain since no coastal fisheries or grey seal hunting occur in this area (Haug et al. 1994).

Nearly all recoveries were made in fishing gear, and returns of tags suggest that seals less than one year of age are particularly vulnerable to entrapment (Bjørge & McConnell 1986). The fishing effort will certainly influence the rate of recoveries (Wiig & Øien 1987). The total rate of recoveries of 4,6 % in this study is slightly lower than results from Central Norway (Wiig & Øien 1987) and the British Isles (Hewer 1974). Although our information about fishing effort is sparse, it is evident that the lack of recoveries from Russia may have contributed to the low overall recovery rate. The total number of pups (tagged and untagged) found dead, shot or entrapped in fishing gear during the study period is unknown. The total pup production in North Norway and Russia can therefore not be estimated from these mark-recapture experiments (Wiig & Øien 1987).

Previous tagging experiments have confirmed that remarkable distances may be covered by grey seal pups (Hickling et al. 1962, Mansfield & Beck 1977, Bjørge & McConnell 1987). Thompson et al. (1991) followed free-ranging grey seals at sea by the use of radio transmitters, and documented travels characterised by a direct,

relatively fast horizontal movement. Several pups in this study were moving great distances in a short time, one approximately 1000 km in 18 weeks, another 800 km in 13 weeks. The present observations, in particular some of the long distance migrations from Russia to North Norway, support previous indications of a substantial migration potential among young grey seals (e.g. Bjørge & McConnell 1987).

Several recoveries were reported from the moulting period (March-April, Bonner 1981, Wiig 1986, 1987), often at considerable distances from the tagging site, suggesting mixing of seals from different breeding colonies during the moult. Some evidence of mixing between assumed grey seal colonies outside the breeding season is also known from other areas (Harwood et al. 1976, Mansfield & Beck 1977, Anon 1996). It is important to take this into consideration when surveying grey seals during the moulting season since the seals are not necessarily resident in the area where they are counted. By use of satellite-tags, swimming tracks have been obtained of adult grey seals, showing movements over distances up to 2100 km as well as frequent interchange between major haul-out areas (Anon 1996).

Due to the relatively short period of recoveries, no mature seals have been recovered in the present study. However, recoveries of mature grey seals tagged at Froan in Central Norway indicate that the seals return to breed in the area where they were born, and there was no indication that this colony was recruiting other colonies (Wiig & Øien 1987). Future recoveries of mature seals may provide information as to whether this is the case also in our study area.

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Table 1. Grey seals tagged between Lofoten in Norway and The White Sea in Russia from 1989 to 1994 and recoveries by 31 December 1995.

Tagging			Number of recoveries						
Date	Locality	N	1990	1991	1992	1993	1994	1995	Total
1989									
Nov	Røst	13							-
Oct	Mosken	18	1						1
1990									
Nov	Kamøya	7							-
Dec	Kongsfjord	14		3					3
1991									
Nov	Røst	9			1				1
Oct	Mosken	16							-
Dec	Kongsfjord	3							-
Nov	Ainov	232		1	7	1	1		10
Nov	Seven Island	38							-
1992									
Nov-Dec	Kongsfjord	16							-
Nov	Ainov	49				1			1
1993									
Nov	Kamøya	25					1	1	2
Nov-Dec	Kongsfjord	10					1		1
1994									
Nov	Kamøya	38						5	5
Nov-Dec	Kongsfjord	6						1	1
Nov	Ainov	261					2	7	9
Nov	Seven Island	32						2	2
Total		787	1	4	8	2	5	16	36

Table 2. Monthly recoveries of young grey seals pursuant to tagging 1989 - 1994, i.e. during their first year of life.

	Dec	Jan	Feb	Mar	Apr	May	Jun
Number recovered	3	1	5	4	9	7	4

Table 3. Recoveries of grey seals by sex, localities and distance from tagging site.

No	Sex	Tagging locality	Recovery locality	Age at recapture	Distance (km)
E8844	Male	Røst	N Sørvær	0	80
E6523		Mosken	N Leknes	0	70
E1590	Male	Kamøya	NW Engvik	2	190
E1617	Male	Kamøya	W Sørvær	0	70
E1648	Female	Kamøya	Rødøy	0	620
E1509	Male	Kamøya	Porsangerfjord	0	170
E1526	Female	Kamøya	Porsangerfjord	0	170
E1529	Female	Kamøya	N Rolfsøy	0	40
E1535		Kamøya	NW Sørvær	0	550
E1560	Male	Kongsfjord	Måsøy	0	180
E1561	Male	Kongsfjord	NW Loppa	0	360
E1563	Male	Kongsfjord	Rekvik	0	480
E1627	Male	Kongsfjord	Bøkfjord	0	160
E1540	Female	Kongsfjord	Lebesby	0	175
E2755	Female	Ainov	Neidenfjord	0	90
E2756	Female	Ainov	Kongsfjord	0	145
E2738	Female	Ainov	Bugøynes	0	70
E2768	Female	Ainov	Gandvik	0	90
E2772	Female	Ainov	Gandvik	3	95
E2781	Male	Ainov	Magerøy	0	305
E3014	Male	Ainov	Ekkerøy	0	65
E3087	Female	Ainov	W Sørvær	0	420
E3088	Female	Ainov	Porsangerfjord	0	340
E2957		Ainov	Jarfjord	1	50
E3099		Ainov	Kongsfjord	0	150
E3174	Female	Ainov	Kongsfjord	0	150
E6917	Male	Ainov	N Rolfsøy	0	355
E6949	Female	Ainov	N Rolfsøy	0	355
E6957	Female	Ainov	SE Skjervøy	0	520
E6980	Female	Ainov	W Rolfsøy	0	375
E6997	Male	Ainov	N Rolfsøy	0	355
E7052	Male	Ainov	N Rolfsøy	0	350
E7120	Male	Ainov	N Ryba Peninsula	0	18
E7121	Male	Ainov	N Ryba Peninsula	0	18
E3152	Male	Seven Islands	NW Myre	0	1010
E6906	Male	Seven Islands	Lyngen	0	792

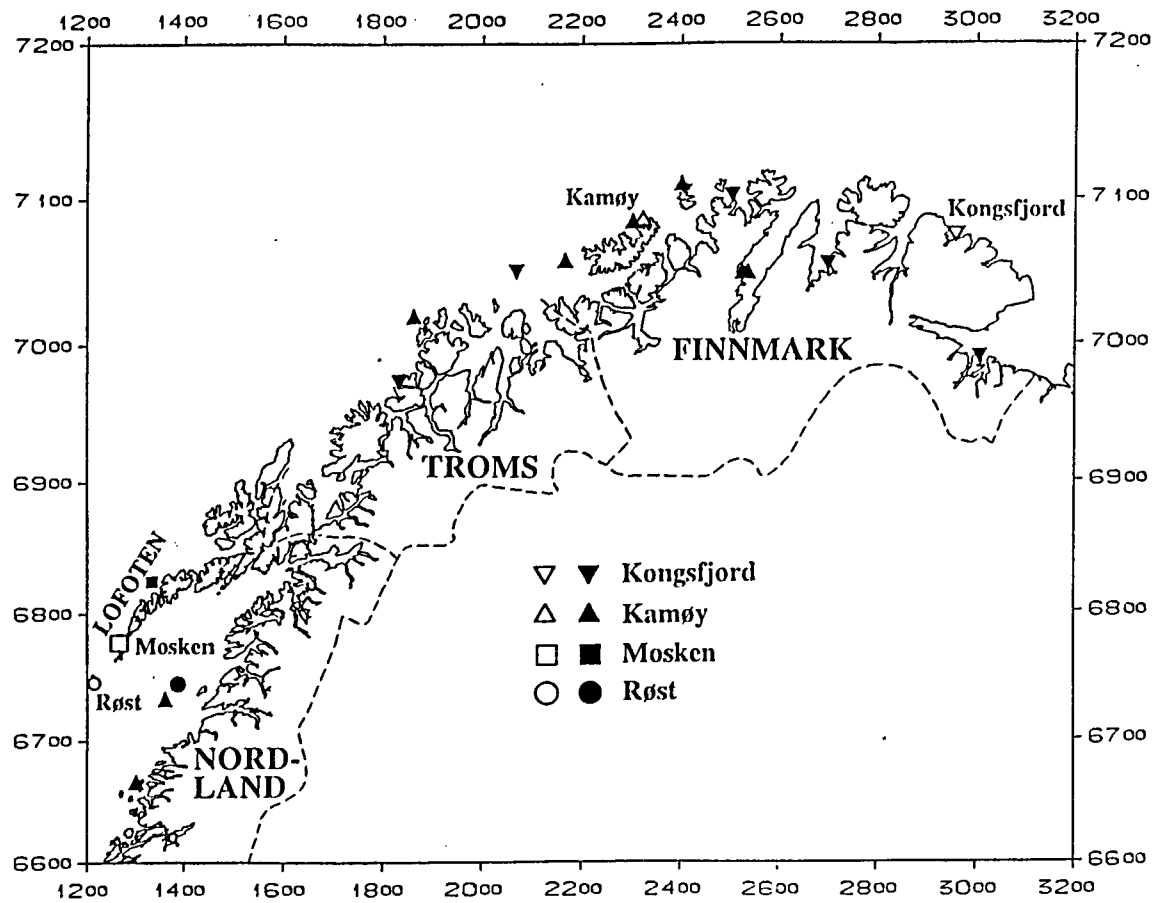


Fig. 1. Grey seal tagging in various parts of Norway. Map of sites where pups were tagged and released (Open symbols) and where recaptures were made (filled symbols). Symbol form indicate the tagging site of each recapture.

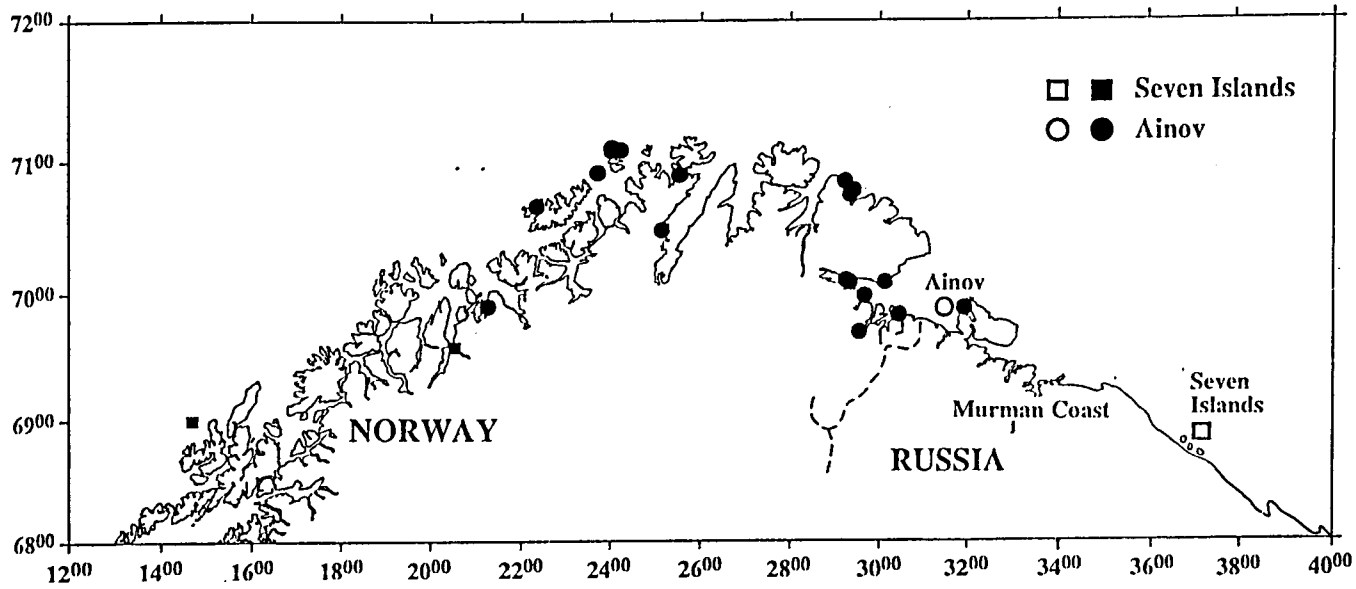


Fig. 2. Grey seal tagging on the Murman coast in Russia. Map of sites where pups were tagged and released (Open symbols) and where recaptures were made (filled symbols). Symbol form indicate the tagging site of each recapture.