Recoveries of grey seals (*Halichoerus grypus*) tagged on the Murman coast in Russia

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ABSTRACT

A total of 612 grey seal (*Halichoerus grypus*) pups were tagged on the Murman coast, Russia, in the years 1991, 1992 and 1994. A majority of them (542) were tagged at the Ainov archipelago. Thirty-one (2.9%) of the tagged seals have been recovered, mainly (77%) as bycatches in fishing gear. The majority of recaptures (74%) were made during the first year after tagging, while the oldest recaptured seal was 10 years old. Only 1 recapture, at Ainov, was made in the area were the seals had been tagged, otherwise distances between tagging and recaptures varied from less than 100 km to more than 1,000 km. All recaptures were made north of 68°N.

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INTRODUCTION

In the northeast Atlantic, grey seals (*Halichoerus grypus*) are distributed from the British Isles and northwards along the coast of Norway and on the Murman Coast in Russia (Bonner 1981, Wiig 1986, Haug *et al.* 1994). On the Murman coast, grey seals are generally confined to 2 main breeding areas, the western Ainov and the eastern Semi (Seven Islands) archipelagos. Crude estimates imply that 3,400 grey seals inhabited these colonies in the early 1990s (Haug *et al.* 1994). In Finnmark there are several minor grey seal breeding areas. The biggest colony is in Kongsfjord (position Kongsøya: N 70° 42', E 29° 27') where 81 pups were produced in 2003, and the number of grey seals in Finnmark County is estimated to be 700 - 900 (Nilssen *et al.* 2004). The distance measured as shortest possible swimming distance between the Kongsfjord colony and the Ainov colony on the Murman coast is approximately 165 km.

As part of a study of coastal seals and their interactions with inshore fisheries along the Norwegian coast, 3,571 grey seal pups were tagged during the period 1975 - 1998. The purpose of these taggings was to study migrations, bycatch mortality and to verify age determinations. It was observed that 7% of the tags were returned (Bjørge *et al.* 2002). The seals dispersed considerably, although some regional fidelity seemed to exist. Incidental mortality, mainly in bottom-set nets, accounted for the majority of deaths.

Cooperation with Russian scientists made it feasible to conduct tagging of 612 pups in large grey seal colonies on the Murman coast in 1991, 1992 and 1994 (Haug *et al.* 1994). The purpose of this paper is to present information on recaptures from this tagging experiment in Russia, and to compare the results with the results from the larger experiment on the Norwegian coast.

MATERIALS 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 plastic Dalton Jumbo Rototags, imprinted with return address and serial number, in the web of one of the hind flippers.

The Institute of Marine research paid a reward for the return of tags with information on date and site of recovery. In most cases, further information regarding the means of recovery was provided, which was used to determine the cause of death. Distance between tagging and recapture sites was measured as the shortest possible swimming distance.

A total of 612 pups was tagged in 1991, 1992 and 1994 (Table 1) at 2 localities in Russia: 542 at Ainov (position Big Ainov: N 69°50' E 31°35') and 70 at Seven Islands (position Big Litskiy: N 68°42' E 37° 43') (see Fig. 1).

RESULTS

Of the 612 grey seal pups tagged, 31 (2.9%) were recovered (Table 1). The cause of death of recovered seals was known in most cases (96%). Incidental mortality in fishing gear accounted for the majority (77%) of the recoveries, while 19% were taken in hunting operations. The majority of recaptures (23) was made during the first year after tagging, while the oldest was taken after 10 years (Tables 1 and 2). Only 1 recapture was made in the same area where the seals had been tagged (Ainov, see Fig. 1). Most of the recaptures were from the Finnmark coast, whereas a few were made in Troms and Vesterålen. Of the recaptures made of animals within their first year of life, 6 were recovered less than 100 km from the tagging sites, another 4 less than 200 km from the tagging site, while 8 youngsters were recovered between 300 and 400 km from the tagging sites (Table 2). Three extremely migrant pups, tagged at Seven Islands in November 1994, were recaptured 2-5 months later in Troms County, Norway (790-820 km from the tagging site), and in Vesterålen (1010 km from the tagging site) (Fig. 1, Table 2).

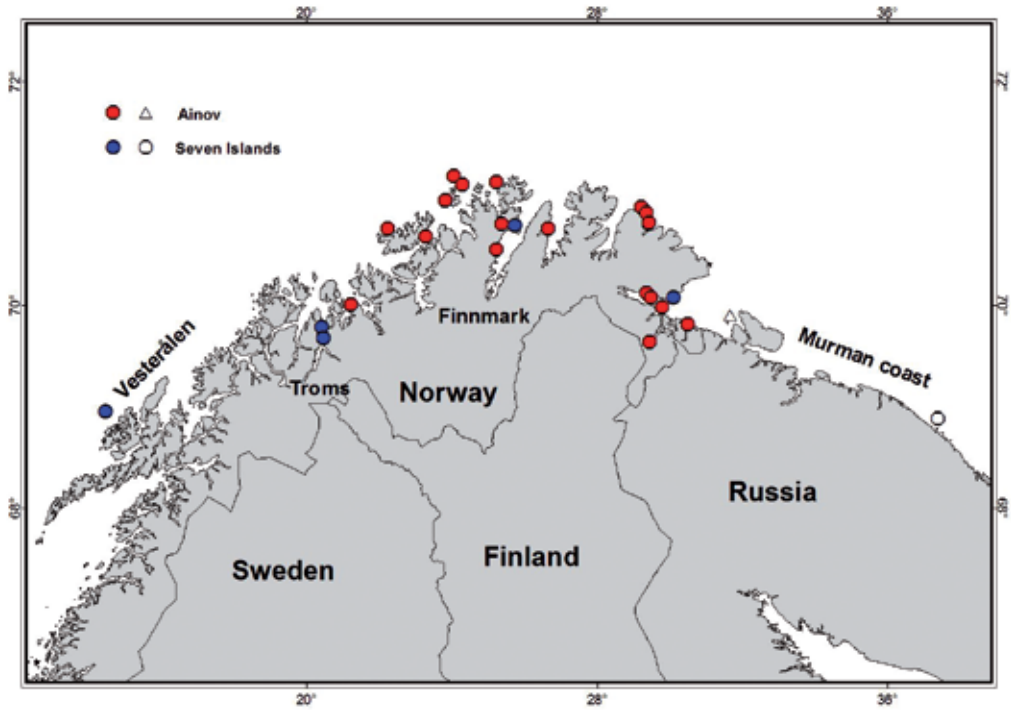

Fig. 1. *Grey seal tagging on the Murman coast in Russia. Map of breeding sites where pups were tagged and released (open symbols) and where recaptures were made (filled symbols).*

DISCUSSION

Considerable dispersal of grey seal pups from their natal rookeries is well documented in previous studies (e.g. Bjørge and McConnell 1986, Bjørge *et al.* 2002), and also confirmed in this study. The presented recoveries suggest a considerable dispersal of pups from the Murman coast breeding colonies to North Norway, in particular Finnmark.

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, Ziryanov and Mishin 2007). Wiig (1986) suggested a discontinuous distribution of grey seals along the coast of Norway from Rogaland (58°N) to Finnmark (see Fig. 1), with largest abundance in the areas between 63°N and 68°N. These patterns were also supported in boat based abundance estimate surveys, performed in 2000-2003, covering all relevant grey seal areas on the Norwegian coast (Nilssen and Haug 2007). Based on the results from their tagging experiment in 1975-1998, which covered the Norwegian coastal areas north of 62°N, Bjørge *et al.* (2002) suggested a southern (Trøndelag, 62°-65°N), a central (Nordland, 65°-68°N), and a northern (Troms and Finnmark, see Fig. 1) grey seal area, with a transition zone at around 68°N (just south of Vesterålen, see Fig. 1). In this experiment, seals from areas south of the transition zone never entered the northern areas, whereas seals from the north never entered the southern area, and only very seldom were recaptured in the central area. The grey seal dispersal observed in the Murman coast experiment suggest that also grey seals breeding on the Murman coast could be included in the northern area in that all recaptures were made north of 68°N.

A majority of the recoveries was made in fishing gear (77%), and returns of tags suggest that seals less than 1 year of age are particularly vulnerable to entrapment. This is in good agreement with the results obtained in the Norwegian coast tagging experiment in 1975-1998, where 79% of the recaptures were caused by incidental mortality, mainly bottom set gill nets, and the majority of recoveries was made the 3 first months after birth, although high incidental mortality prevailed during the first 8-10 months (Bjørge *et al.* 2002). The fishing effort will certainly influence the rate of recoveries (Wiig and Øien 1987). Although our information about fishing effort is sparse, it is evident that the lack of possibilities of obtaining recoveries from Russia has contributed to the low overall recovery rate (2.9%), while 7% of the tags from the Norwegian coast experiment were returned (Bjørge *et al.* 2002). The total number of pups (tagged and untagged) found dead, shot or entrapped in fish-

Table 1. Grey seals tagged on 2 breeding colonies (Ainov and Seven Islands) on the Murman coast, Russia, in 1991, 1992 and 1994, and recovered up to date 31 December 2004.

Tagging			Number of recoveries											
Date	**Locality**	**N**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**00**	**01**	**Total**
1991														
Nov	Ainov	232	1	8	1	1			1				1	13
Nov	Seven Island	38												-
1992														
Nov	Ainov	49			1									1
1994														
Nov	Ainov	261				2	7	2		1				12
Nov	Seven Island	32					4	1						5
Total		**612**	**1**	**8**	**2**	**3**	**11**	**3**	**1**	**1**	**0**	**0**	**1**	**31**

Table 2. Recoveries of grey seals tagged on Ainov and Seven Island on the Murman coast, Russia and distance from tagging sites.

	Distance from tagging site (km)										
Age (years)	<100	<200	<300	<400	<500	<600	<700	<800	<900	<1000	<1100
0	6	4		8	1	1		1	1		1
1	1										
2				2		1					
3	1										
4	1										
6					1						
10			1								

ing gear during the study period is unknown. The total pup production in Russia can therefore not be estimated from these tagging experiments.

Previous tagging experiments have confirmed that remarkable distances may be covered by grey seal pups (Bjørge and McConnell 1986, Bjørge *et al.* 2002). Similar observations have been made when free ranging, older grey seals have been monitored at sea by the use of telemetric methodology (Thompson *et al.* 1991, McConnell *et al.* 1999). Several pups in this study were moving great distances in a short time, one approximately 1,000 km in 18 weeks. The long distance migrations observed support a substantial migration potential among young grey seals.

Some mature seals were recovered in the present study. The 2 oldest were 6 and 10 years of age (Table 2). Previous recoveries of mature grey seals tagged in the southern areas of Norway indicate that the seals return to breed in the area where they were born, and there was no indication that the studied colonies were recruiting other colonies (Wiig and Øien 1987). However, the recovery of 2 mature grey seals tagged on the Murman coast may imply that this is not necessarily the case in our study area. Future recoveries of mature grey seals may provide additional information as to whether seals return to their breeding sites, recruit other colonies or both.

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