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Distriubution, habitat use and status of protection of harbour seals *Phoca vitulina* and grey seals *Halichoerus grypus* in Finnmark, North Norway

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During surveys in the year 1989-91 approximately half of the breeding and moulting populations of harbour seal in Finnmark were located in the inner parts of Porsangerfjord and Laksefjord in central Finnmark. Grey seals were observed only occationally in these fjords , but was the most abundant and widely spread species between Laksefjord and the Russian border and between Porsangerfjord and Troms County. Totally, 97 % of the harbour seal population prefered to breed on small islands in the inner parts of the fjords, 45 % prefered to moult in the same areas and 42 % moulted on coastal rocks at low tide. The grey seal prefered the outer coastal areas, both for breeding and moulting. On the breeding sites, there seemed to be a preference for the most sheltered areas. Approximately 50 % of the harbour seal and 40 % of the grey seal populations in Finnmark hauled out in protected areas.

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INTRODUCTION

The coastal seals, harbour seal *Phoca vitulina* and grey seal *Halichoerus grypus,* breed and moult on the coast of Finnmark, North Norway.

Based on information obtained from interviews and questionnaries, Øynes (1964) estimated the harbour seal population in Finnmark in the early 1960s to be approximately 180 individuals. Ship-bound (1981 - 1983) and aerial (1984) surveys revealed a minimum estimate of 195 animals in Finnmark in the early 1980s (Bjørge et al. 1982, Bjørge 1991). The most recent review of the status of the harbour seal in Finnmark is given by Henriksen and Haug (1994b), who, based on surveys performed in 1989 - 1991, reported 332 moulting harbour seals in Finnmark, the majority being observed in Porsangerfjord (**Figure 1**).

Øynes (1964) suggested that in the early 1960s, the number of grey seals in Finnmark may have been as few as five. Wiig (1987) used data from several counts, performed between 1981 and 1985 and suggested a minimum grey seal population of 353 individuals. In a recent review of the status of grey seals in Finnmark, Haug et al. (1994) reported a minimum estimate of 554 grey seals (counted during moult in 1991), most of them situated in the area west of Porsangerfjord (**Figure 1**).

Throughout their range, harbour seals give birth on sandbanks or rocks, usually in the intertidal zone (Bonner 1994), and they are adapted to a wide variety of terrestrial environments for this purpose (Riedmann 1990). Shallow waters, with skerries suitable for haul out, often located far from the mainland and larger islands, seems to be particularly preferred by harbour seals in Norway (Bjørge

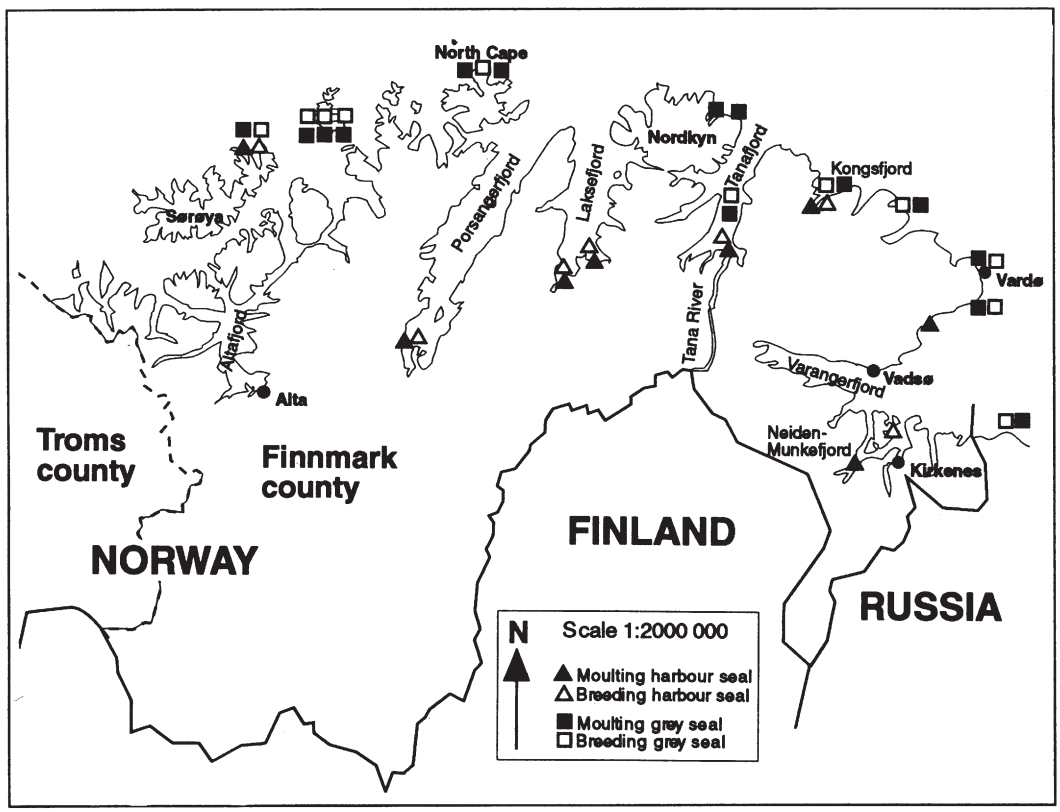

Figure 1
Breeding and moulting sites for harbour seals and grey seals in Finnmark County in 1989-91, North Norway and the biggest grey seal colony in Russia.

1986). Throughout the North Atlantic, the grey seal breed in a variety of different habitats; island, sandy mainland, beaches, rocky inlets, fast ice and drift ice (e.g. Riedman 1990). Along the Norwegian coast grey seals seem to prefer the outlying skerries, whereas the harbour seal selects more sheltered areas (Wiig 1985a, 1985b, 1986, 1987). In a review of the status of marine mammal habitat protection in Norway, Bjørge (1986) reported that no harbour seals, and approximately 100 grey seals were found in protected areas along the outer coast or on islands in Finnmark. Later, Bjørge (1991) stated that no fjord or sandbank habitat was yet protected for seals in Norway.

Based on observational data obtained in coastal seal surveys performed in Finnmark in 1989 - 1991, it is the aim of this paper to: 1) describe the difference in distribution of the two coastal seal species in Finnmark by comparing their regional abundance especially during their breeding and moulting periods (Nov. 1990 - Oct. 1991), 2) document their habitat preferences and 3) decide their present status of protection.

MATERIAL AND METODS

Both harbour and grey seals were surveyed thoroughly during their breeding and moulting seasons in 1989 - 1994 (Henriksen et al. 1993, Haug et al. 1994, Henriksen & Haug 1994b). Most of the surveys were carried out by inflatable Zodiac boats fitted with outboard motors, and some surveys were carried out by local hunters/fishermen. If several surveys where carried out in the same locality, I use the highest number registered. The maximum number of animals registered is given as the minimum estimate of seals at each locality (see Wiig 1988, 1989). All the surveyes where carried out on low tide, when harbour seals are known to haul out (Venables & Venables 1960). In addition to direct counting, the seals were somethimes photographed and counted from pictures. There were no difference between the numbers based on photos and those based on direct observations.

In Finnmark, the preferred habitats for breeding and moulting grey seals are outer islands/skerries (e.g. Haug et al. 1994), while the harbour seal habitats can be divided into four cathegories; fjord/islands, sandbanks, coastal rocks and outer islands/skerries (Bjørge 1993, Henriksen & Haug 1994b). Outer islands/skerries are habitats on the outermost coast next to the open sea. Fjord/islands represent a habitat in the inner parts of fjords where there are small islands and skerries. Sandbank habitats are areas in riverine estuaries, which are normally covered with water at high tide. Coastal rocks are habitats in the littoral zone along the mainland, most often in sheltered fjords and bays.

Anon (1993) maps the presently established protected areas (i.e. nature reserves etc.) in Finnmark. These data were combined with existing data on distribution and abundance of breeding and moulting harbour seals (see Henriksen & Haug 1994b) and grey seals (see Haug et al. 1994) to evaluate their status of protection.

RESULTS

Differences in distribution of harbour and grey seals

Nearly half of the observed harbour seals were found in the inner parts of Porsangerfjord and Laksefjord in central Finnmark both during breeding and moult (**Table1**, **Figure 1**). No breeding or moulting activites of grey seals seemed to occur in these fjords.

Between Laksefjord and the Russian border (**Figure 1**), respectively 71 % and 58 % of the moulting and breeding coastal seals were grey seals. Most of the harbour seals in this area were found in Kongsfjord (**Figure 1**), which is the only area in the county where both harbour and grey seals occur in relatively high numbers. The harbour seals inhabit a lagoon in the inner part of the fjord, while the grey seals are situated on three small islands in the centre of Kongsfjord (**Figure 1**).

Between the Troms County border and Porsangerfjord, grey seals occurred over a wider geographical range than the harbour seals (**Figure 1**). Grey seals represented 66 % of the observed breeding coastal seals and 91 % of the moulting coastal seals in this area (**Table 1**). Harbour seals were observed only in the fjords around Sørøya (**Figure 1**).

Habitat use by harbour seal and grey seal

For harbour seals, small islands in inner fjords were the most used habitat where 97 % of the breeding seals and 45 % of the moulting seals were found (**Table 2**). Coastal rocks exposed

Table 1. *The highest recorded number of breeding and moulting harbour and grey seals in Finnmark observed during surveys in 1991. The number of pups are given in brackets.*

Locality	Harbour seal Breeding June/July	Moulting Sep./Oct.	Grey seal Breeding Nov./Dec.**	Moulting April
West-Finnmark*	70(3)	25	135(22)	254
Porsangerfjord	90(10)	139	0	0
Laksefjord	30(9)	19	0	15
Nordkyn	0	0	?	14
Tanafjord	1	31		
Kongsfjord	39(11)	64	34(16)	112
Syltefjord	0	0	0	54
Varangerfjord	2	54	23(1)	5
Total	232(33)	332	192(39)	554

* Between Porsangerfjord and the border of Troms County
** November/December 1990

Table 2. *Numbers of harbour seals observed in different habitat types during the breeding (B) and moulting (M) period in Finnmark in 1991.*

Locality	Habitat type: Fjord/islands B	M	Sandbanks B	M	Coastal rocks B	M	Outer islands/skerries B	M
West-Finnmark	65	25					5*	
Porsangerfjord	90					139		
Laksefjord	30	19						
Tanafjord			1	31				
Kongsfjord	39	64						
Varangerfjord	2	40						14
Total	226	148	1	31	0	139	5	14

* Harbour seal observed, but breeding not documented.

at low tide were also important for moulting harbour seals (45 %).

During the breeding and moulting periods, all grey seals were observed in the outermost areas on small islands and skerries next to the open sea. However, there seemed to be a preference for the less exposed places on these skerries/islands, in particular during breeding.

Status of protection of the coastal seal in Finnmark

In Finnmark, 45 - 64 % of the harbour seals and 35 - 44 % of the grey seals hauled out in protected areas during breeding and moulting (**Table 3**). These areas are protected under the Nature Concervation Act of 1970. The nature reserves in Tana and Neiden/Munkefjord were established in 1991, the others in 1983. Hunting is totally prohibited only in the Tana and Neiden/Munkefjord nature reserves (**Table 3**, **Figure 1**). Outside the protected areas, all seals are legally protected between 1 May and 30 November.

DISCUSSION

The presented observations indicate that the distribution of both harbour and grey seals have changed in Finnmark during the past 30 years. No harbour seals were reported from Porsangerfjord in the 1960s (Øynes 1964) or in surveys during the 1980s (Bjørge et al 1981, Øien 1984, Bergfløtdt & Wiig 1985). Henriksen & Haug (1994b), however, document this as the main fjord for the harbour seal in Finnmark in the early 1990s. Breeding or moulting grey seals have not been documented in the fjord, but stray individuals are occasionally observed (T. Morset, Lakselv, pers. comm.). In Laksefjord, both grey seals and harbour seals have been reported both in the 1960s (Øynes 1964) and in the 1980s (Øien 1984). In August 1984, a minimum of 60 harbour seals and 20 grey seals were observed on the same skerry, but after this observation only stray grey seals have been observed in Laksefjord (A. Ørjebu, Vadsø, pers. comm.). The present survey failed to document breeding or moulting grey seals in Laksefjord, while the harbour seal still moults

Table 3. *The highest number of harbour and grey seals observed in breeding (B) and moulting (M) periods in protected areas in Finnmark in the years 1989-91.*

Municipality	Local name of protected area	Harbour seal B	Harbour seal M	Grey seal B	Grey seal M	Hunting season
Sør-Varanger	Neiden/Munkefjord		40			Protected
Båtsfjord	Syltefjordklubben			?	54	01.12-15.03.
Berlevåg	Kongsøyene *			50	112	01.12.-28.02.
Deatnu-Tana	Tana delta	15	38			Protected
Porsanger	Indre Porsangen	90	117			01.12.-31.03.
North Cape	Gjesværstappan			20	45	01.12.-28.02.
Måsøy	Reinøykalven				25	01.12.-28.02.
Hammerfest	Kamøya/Bondøya			12	60	01.12.-28.02.
Total		105	195	82	296	
Percent of total population		45%	64%	35%	44%	

* Kongsøya, Helløya and Skarholmen

and breeds in this fjord. Currently, therefore, Porsangerfjord and Laksefjord seem to be central areas for breeding and moulting harbour seals in Finnmark.

In Tanafjord, a small breeding and moulting colony of grey seals is located on a little island in the center of the fjord, while harbour seal breed and moult on the sandbanks in the Tana river estuary in the inner part of the fjord (**Figure 1**). Bjørge (1986, 1993) reported that this was the only harbour seal colony resident in a sandbank area in Norway. The numbers of both grey and harbour seals in Tanafjord have declined during the past decade, now counting less than 10 and 15 breeding animals respectively (Henriksen & Haug 1994b, Haug et al. 1994). This may be due to severe hunting during the 1980s, drowning in fishing gears in the river and increased disturbances from recreation activities. The establishment of the Tana River Nature Reserve since 1991, may protect the rest of the harbour seals in the area.

Less than 10 breeding and 50 moulting harbour seals were observed in Varangerfjord between 1989 - 1991 (Henriksen & Haug 1994b), whereas 23 breeding and 5 moulting grey seals were observed in 1991 (**Table 1**). In 1992, 83 moulting grey seals were observed in the fjord (Haug et al. 1994). All grey seals breed and moult in the Vardø area, while the documented breeding of harbour seal is on the south side of the fjord (**Figure 1**). In this area, harbour seals also moult on the sandbanks of the Neiden/Munkefjord river estuary, in the south part of the Varangerfjord (see Henriksen & Haug 1994b), indicating a second colony in Norway resident on sandbanks. Further east along the Murman coast, the grey seal is the dominant coastal seal species (Haug et al. 1994), and migrations westwards may contribute to keep up the numbers of i.e. moulting grey seals in Finnmark.

Elsewhere in Northern Norway, grey seals tend to breed on larger islands or on the mainland, and these habitats vary from sandy or stony shores to cliffs with caves and ravines (Bjørge 1986). In Finnmark, the grey seal breeds and moults on smaller outer islands, and breeding on the mainland is not common (see also Henriksen et al. 1993, Haug et al 1994b). During summer, grey seals are often observed at resting places, where they normally neither breed nor moult. Such places are known along the coast of the Nordkyn Peninsula and in the area between Kongsfjord and Vardø (Henriksen et al. 1993) (**Figure 1**).

This study shows that all harbour seals in Finnmark, except for the little colony on the sandbanks in Tana, prefer to breed on smaller islands in the fjords, not far from the mainland (**Table 3**). In Finnmark, where coastal topography is less complex than in mid and southern Norway, harbour seals seem to occupy other habitats than the populations further south in Norway where the majority of the species are found in shallow waters with skerries suitable for haul out, often located far from the mainland and larger islands (Bjørge 1986, 1991).

Outside the breeding and moulting periods, harbour seals very often rest on coastal stones on the mainland, but still in sheltered areas. This is common on the north side of Varangerfjord, in Kongsfjord and in Porsangerfjord where more than 100 animals may haul out on stones in the inner part of the fjord before breeding.

According to Bjørge (1986), about 100 grey seals (in Kongsfjord) out of an estimated population of 350 (29 %), occured in protected areas in Finnmark in the mid 1980s. This study shows that 34 % of the breeding and 44 % of the moulting grey seals now occur in protected areas. Even if we exclude the Kongsfjord protection area, still 16 % of the breeding popula-

tion and 42 % of the moulting population occur in protected areas. Thus, far more grey seals now seem to occur in protected areas in Finnmark than a decade ago. Since no new protected areas affecting grey seals are established during the last 10 years, this may be due to an increase in the grey seal population during the last years (see Haug et al. 1994).

Bjørge (1986) reported that no harbour seals in Finnmark occured in protected areas, and that no fjords or sandbanks were yet protected for seals. However, in 1991 approximately half of the breeding and moulting population of harbour seal in the county were observed to inhabit protected areas, mainly due to new observations of harbour seals inside protected areas in Porangerfjord (see Henriksen & Haug 1994b) and the establishement of the Tana and Neiden/Munkefjord Nature Reserves in 1991. The harbour seals in Porsangerfjord inhabit a protected fjord habitat whereas the harbour seals in Neiden/Munkefjord and Tana inhabit protected sandbank habitats.

Except for the protected areas in Tana delta and Neiden/Munkefjord, both harbour and grey seals can be hunted in the other protected areas (**Table 3**). This is due to the fact that these areas where established for other purposes, mainly protection of seabirds. Normally the hunting season for all seal species in northern Norway is between 1 December and 30 April. The hunting seasons in the protected areas are adjusted to the seabirds lifecycle, and the shortened hunting season for seals in these areas is a secondary effect (**Table 3**).

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SAMMENDRAG

Utbredelse av steinkobbe og havert, valg av områder for kasting/hårfelling og deres vernestatus i Finnmark.

Undersøkelsen bygger på registreringer i Finnmark i årene 1989-91. Omtrent halvparten av kaste- og hårfellingsbestanden av steinkobbe har tilhold i de indre deler av Porsangerfjord og Laksefjord, mens haverten ble observert bare tilfeldig her. Mellom Laksefjord og grensa mot Russland og mellom Porsangerfjord og Tromsgrensa, var haverten den mest tallrike og mest utbredte arten av disse to. 97 % av steinkobbebestanden foretrakk å kaste ungene på små øyer i bunnen av fjorder, 45 % foretrakk å gjennomføre hårfelling på de samme stedene og 42 % gjennomførte hårfelling på steiner i fjæresonen. Haverten foretrakk de ytterste kystområdene, både for kasting og hårfelling. På slike steder syntes det likevel å være en preferanse for de mest beskyttede stedene. 45-64 % av steinkobbe- og 35-44 % av havertbestanden i Finnmark foretok kasting og hårfelling innenfor verneområder.

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