

Present knowledge of grey seals (*Halichoerus grypus*) in Faroese waters

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ABSTRACT

The grey seal (*Halichoerus grypus*) is the only pinniped species breeding in the Faroe Islands. They are present all year round, and can be observed throughout the archipelago, but prefer to reside in exposed coastal areas, away from human settlements. Grey seals breed primarily in caves, common along the Faroese coastline. Systematic scientific investigations have not been conducted on grey seals in the Faroes. Present population level is presumably around 1,000 to 2,000 animals. These seals have probably been hunted since the Norse settlement in the 8th century. Apparently, this removal has prevented the population from increasing above a certain threshold. Tagging studies have demonstrated a connection with seals from UK waters, but the magnitude and influence of this movement is not known. Present biological knowledge is very limited and insufficient; this is due largely to the inaccessible nature of these seals.

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INTRODUCTION

The grey seal (*Halichoerus grypus*) occurs throughout the western and eastern side of the North Atlantic, as well as in the Baltic (Bonner 1994). The eastern Atlantic population is distributed from the Murman coast of Russia in the north to the French coast of the Bay of Biscay in south and west to Iceland. In the Faroe Islands the grey seal is the only pinniped species that breeds in the islands, and has been so for the last hundred and fifty years (Degerbøl 1940, Reinert 1982). In the past, harbour seals (*Phoca vitulina*) were also breeding on the islands, but these were probably exterminated about 1850 (Reinert 1982). Coastal seals have probably been hunted along with whales in the Faroes since the Norse settlement in the 8th century (Landt 1800, Bloch 1998). Grey seals were mainly hunted during the breeding season, starting in late September, when breeding sites were visited, and pups and available adults were taken

(Landt 1800, Degerbøl 1940, Fig. 1). From historical records on seals and seal hunting as well as current observations, these animals mainly breed in caves in the Faroes, a behaviour that may be exceptional for the species. A low sighting rate of grey seals at haul-out sites during the moulting season, February-April, a period when the species increases its haul-out frequency, may indicate that they also moult in caves. Not all caves are accessible to man; some even have their entrance below water. A strong connection to caves could explain why the grey seal has survived the high hunting pressure, especially in periods of food shortage and hunger on the islands, while the harbour seal, which mainly lived and propagated in fjord areas (Landt 1800), was extirpated. The traditional cave sealing lasted until the start of 19th century (Degerbøl 1940). This paper gives a short description of what is known of grey seals populating Faroese waters.



Fig. 1. A grey seal nursing her pup. (Photo: Mart and Ivar Jüssi)

DISTRIBUTION, MIGRATION AND STOCK DELINEATION

Grey seals can be observed throughout the archipelago of eighteen small islands during all seasons. The preferred habitat appears to be the exposed coastal areas facing the open sea (Fig. 2); areas where the majority of caves are located. Weather conditions and tidal currents, running up to several metres per second may affect the local distribution pattern of grey seals, who may more frequently occupy the fjords and sheltered areas during periods of unfavourable weather.

Tagging and satellite telemetry studies, to investigate migration patterns, have not been conducted on grey seals in Faroese waters. Such investigations have been carried out for neighbouring grey seal stocks, especially in UK waters (Hammond *et al.* 1993, McConnell *et al.* 1999). Flipper tag recoveries in the Faroes have all been from seals tagged around the British Isles, mainly from colonies in Orkney and the islands north-east and east of Scotland (e.g. North-Rona, Farne) (Boyd and Campbell 1971). More recent telemetric studies have also shown that grey seals from the British Isles migrate north into Faroese waters (McConnell *et*

al. 1999). Although tagging studies have established a connection between Faroese and British grey seals, and indicate that Faroese waters may be a natural part of the space used by grey seals from the British Isles (Matthiopoulos *et al.* 2004), the intensity or influence of such a migration is not known. Prime (1978), in his analysis of Faroese grey seal teeth (see below), concluded that the seals showed the same patterns regarding annual survival (0.93 for 1+), age at first pupping (6.25 years), annual fecundity (87%) and timing of breeding (max. number of pups born in October), as the Farne Island, Outer Hebrides and Orkney grey seals. A genotypic analysis of 68 Faroese grey seal samples to analyse the relations between Faroese and UK seals, that may throw new information on the issue, is upcoming (Bill Amos pers. comm.).

DIET

The summer diet of grey seals in the Faroes has been investigated from stomach contents of 68 animals collected in shallow waters in June, July and August in 1993-95. Only fish prey were found in the stomachs. Otoliths were found in 40 stomachs (59%), and 16 prey species were identified (Table 1). Only a few prey species, i.e. cod (*Gadus morhua*), saithe (*Pollachius virens*),

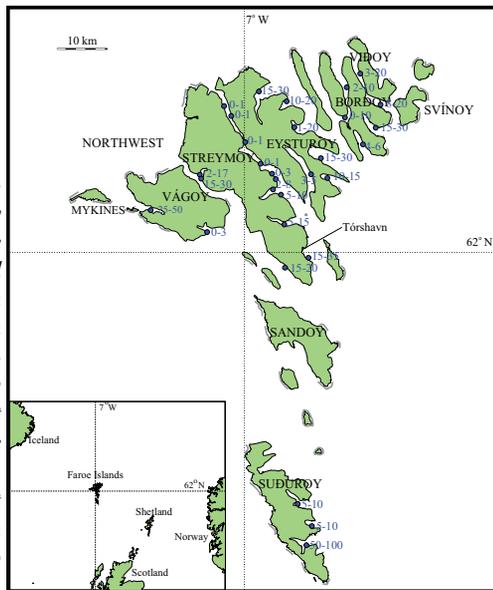
Table 1. Frequency of occurrence (FO_i), proportion reconstructed biomass (B_i) and estimated fish length (FL) (± standard deviation) in centimetres based on otoliths recovered in grey seal stomachs sampled in Faroe Islands during summer in 1993-95.

Prey Item	FO _i	B _i	FL
Pisces			
Clupeidae			
Herring <i>Clupea harengus</i>	2.5	0.1	
Sprat <i>Spratus spratus</i>	7.5	0.1	
Gadidae			
Cod <i>Gadus morhua</i>	47.5	13.3	31.4 (14.7)
Haddock <i>Melanogrammus aeglefinus</i>	15.0	3.6	23.5 (10.1)
Ling <i>Molva molva</i>	5.0	0.7	
Norway pout <i>Trisopterus esmarkii</i>	5.0	0.1	
Saithe <i>Pollachius virens</i>	25.0	5.8	18.9 (11.9)
Whiting <i>Merlangius merlangus</i>	10.0	0.3	
Unid. <i>Gadoid</i> remains	25.0	1.1	
Zoracidae			
Eelpout <i>Lycodes</i> sp.	7.5	<0.1	
Cottidae			
Bullrout <i>Myoxocephalus scorpius</i>	7.5	<0.1	
Mugilidae			
Mullet <i>Chelon labrosus</i>	2.5	0.1	
Pholidae			
Butterfish <i>Pholis gunnellus</i>	5.0	<0.1	
Anarhichadidae			
Catfish <i>Anarhichas lupus</i>	32.5	69.1	59.5 (14.5)
Ammodytidae			
Sandeels <i>Ammodytes</i> sp.	47.5	3.2	11.5 (2.2)
Pleuronectidae			20.3 (8.7)
Lemon Sole <i>Microstomus kitt</i>	20.0	2.2	
Plaice <i>Pleuronectes platessa</i>	5.0	0.1	
Unid. Pleuronectid remains	2.5	<0.1	
Unidentified remains	57.5	0.5	
Number of stomachs with contents	40		
Percentage of stomachs with contents	58.8		

haddock (*Melanogrammus aeglefinus*), catfish (*Anarhichas lupus*), sandeel (*Ammodytes* sp.) and lemon sole (*Microstomus kitt*), contributed to the bulk of the diet, both in terms of occurrence and biomass. Grey seals were found to feed mainly on small pre-recruited fish species. One exception was catfish, where seals fed on fairly large catfish compared to other prey. The diet indicated that Faroese grey seals forage largely on prey species distributed mainly in shallow near-shore waters (Mikkelsen 1998, Mikkelsen et

al. 2003). Mikkelsen et al. (2003) found, when comparing diet in 3 main areas, some geographical variation, where sandeels were most frequent in the diet in Northwest, catfish around Sandoy and cod in the Svinoy area. Although stomach content analysis only reflects the most recent meals, the diet may support a resident nature of these seals, mainly feeding in the shallow waters of the archipelago, at least during summer.

Fig. 2. Main distribution areas of grey seals in the Faroe Islands (lines) and location of the 30 fish farms in operation in 2002 (dots). Approximate numbers of grey seals shot at each farm in the years 2001 and 2002, as obtained by direct contact with the fish farmers, are also given.



POPULATION SIZE

Grey seals are seldom seen in high numbers in the Faroes. At favourable haul-out sites numbers rarely exceed 30 seals. An exception is the island of Mykines, the densest populated area, where at times up to 300 seals can be seen. Grey seals in the Faroes have never been surveyed in order to estimate population size. Smith (1966), in his review of the world's grey seal populations, estimated the population in the Faroes to number 3,000 animals. From May 1963 to March 1967, a bounty hunting programme was implemented in the Faroes, after local fisherman had complained about the ever-increasing number of seals. During the bounty period, 930 jaws were delivered to the Faroese Fisheries Laboratory (Reinert 1982). About 60 percent of all seals reported were pups, taken mainly in October, giving an average catch of 140 pups a year. Based on these catch figures, Reinert (1982) concluded that the annual pup production may have been of around 500 animals, and the total population about 3,000 animals, i.e. the same level as given by Smith (1966). Prime (1978), who analysed a high portion of teeth from the bounty hunt, did not comment on the population size, but concluded that it seemed unlikely that the population was decreasing, unless persecuted. In the bounty hunt, a relatively high bounty was paid for each seal. Therefore, it seems likely that hunting pressure was high during these years, and although the initial population may have num-

bered 3,000 animals, the number certainly decreased to a low level during the bounty period.

Present population size is probably of the order 1,000 to 2,000 animals. Irregular observations around the islands indicate that the Faroese population has not shown a rapid increase, as has been evident for colonies around Britain (NAMMCO 2003) and in the Northwest Atlantic (Bowen *et al.* 2003). Obviously, the Faroese grey seal population has not recovered to old levels in the past thirty years (pers. obs.). The main reason is because seals continue to be hunted around fish farms. This removal, which seemingly is keeping the population at a low level, started with the establishment of aquaculture in the islands in late 1970s. Also, high pup mortality, especially during the intense fall storms, which can float pups off the breeding grounds, may affect the population growth of grey seals in the Faroes. Many former breeding grounds (Landt 1800) are not in use today. The reason may be increased human activities and landscape deformation, forced by wave action, eroding the steep foreland of the Faroes (Reinert 1982, pers. obs.). A reduction in the number of protected breeding grounds may also have affected breeding success. For the relatively small population of grey seals in the Faroes, removal of a significant number of animals around fish farms, and high pup mortality, have likely had significant impacts on the population level.

REMOVALS

With the closure of the bounty hunt in 1967, regular grey seal hunting in the Faroes ended (Reinert 1982). This resulted from a combination of legislation concerning animal protection that limits harvesting to the use of rifles only, and also new firearms legislation, which restricts who can get a rifle licence. Today, licences are only given to persons directly engaged in marine fish farming, and only for use at the farm. Therefore, grey seals are only exploited in the vicinity of fish farms currently in operation. In 2006, the number of fish farms was 15. No management regime is implemented; fish farmers are free to shoot all seals approaching the farm. Hunting logbooks are not mandatory, and thus no statistics are available on exploitation levels of grey seals in the Faroes.

An overview of the magnitude of grey seal harvest around fish farm was acquired in 2003. Representatives of all operative fish farms (see Fig. 2), in most cases the fish farmer most involved in the seal hunt, were questioned in person about the approximate number shot, by month, during the last 2 years (Mikkelsen 2003). Surprisingly, a relatively high number of seals seemed to be shot in these years, in the order of 2 to 4 hundred animals a year. From the geographical distribution of salmon farms, it was not surprising that most seals were shot at farms located near favourable haul-out sites. Fish farmers regard grey seals as a pest, since their presence often results in increased stress and decreased appetite for the fish, which in turn affects their growth and survival. Farmers also experience more direct conflicts at times, when seals break the nets and enter cages to feed; seals have even been shot when inside nets. Fish farmers also stated that the highest number of seals was seen around the salmon farms in the period November-April, and that newly weaned pups were regularly seen in the fjords in November and December, especially in periods after harsh weather conditions. Since this study, there has been a downturn in the salmon farming economy, and half the farms have closed. As a result, hunting pressure on grey seals has declined.

In the Faroese fishery, by-catch of grey seals does not seem to be significant (Mikkelsen 2005). Fewer than 10 animals are thought to be killed by fishing gears (e.g. gillnets, long-lines) annually. An obvious reason is the absence of a gillnet fishery in shallow waters of the Faroes (Mikkelsen 2005). Other induced mortality, i.e. reporting on suspicious sighting of dead seals, perhaps indicating a virus outburst or other illnesses have never been documented. A more notable source of mortality, especially for the relatively small grey seal population in the Faroes, may be predation by killer whales. These predators are seen year after year, during the summer, distinctively moving close to shore around the islands. In days when killer whales are present, grey seals are absent (pers. obs.). Investigations of killer whale stomachs have detected some seal remains (Bloch and Lockyer 1988).

CONCLUSION

Grey seal may have been an important natural resource, together with other marine mammals, for the islanders ever since they settled in the Faroes in the 8th century. The hunting pressure may have varied, by the availability of other food sources, but was perhaps especially intensive in periods with food scarcity. Harbour seals were also found in the islands at one time, but hunting pressure appears to have resulted in their extermination about 1850. One reason why grey seals have not suffered a similar fate may be the behavioural adaptation of grey seals, hiding away in the many caves available in the Faroes during breeding. Tag returns show that immigration of animals from the UK occurs and this may also, if these animals integrate in the local breeding stock, have contributed to the survival of grey seals around the Faroe Islands. The relative importance of immigration versus cave refuges to the continued presence of grey seals is not known.

Present knowledge of the small breeding population of grey seals in the Faroe Islands is very limited. They are difficult to study because they are timid and difficult to access. The grey seal is still hunted in the islands, but the hunt is restricted to fish farms. Present removal is seemingly keeping the population level down, but may not, as long as the hunt is not intensified and expanded, threaten the population. However, present knowledge is far from adequate and the lack of a management regime for this species is cause for some concern. This concern has also been raised by the NAMMCO working group on grey seals (NAMMCO 2003). Recommended scientific investigations include mapping of potential breeding sites, annual pup counts to estimate population size and productivity, and reliable catch statistics, for monitoring removal levels (Mikkelsen 2003, NAMMCO 2003). This information would also be a minimum requirement for accessing potential removal levels from the population, and may initiate a discussion on the management goals of grey seals in the Faroes.

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