Report on the Status of Hooded Seals in the Northwest Atlantic

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Northwest Atlantic Hooded Seals

photo: B. Bergflødt

Background

The hooded seal is the second most abundant, and largest, seal species in the Northwest Atlantic. Adult males average 2.6 m in length and weigh about 300 kg; females are significantly smaller averaging 2.2 m and 160 kg respectively.

Like harp seals, hoods give birth (whelp) on pack ice. In the Northeast Atlantic, whelping occurs near Jan Mayen off the east coast of Greenland, while in the northwest, it occurs off the coast of southern Labrador or northeastern Newfoundland (the 'Front'), in Davis Strait, and in the Gulf of St. Lawrence (the 'Gulf'). It is not known how much interbreeding there is among hooded seals whelping in different areas of the Northwest Atlantic, but seals from all three areas are known to mix during the non-breeding period.

Hooded seals are seasonal migrants, spending most of the year in offshore waters. In the Northwest Atlantic, they summer off south and west Greenland or in the Canadian Arctic, and migrate to the whelping areas during the late fall or early winter. A single pup, called a blueback, is born during late March. After the pup is weaned, the female mates and then disperses to feed. Recent data obtained using satellite transmitters show that hooded seals that whelp at the Front move off the Continental Shelf towards either the Flemish Cap or Rekjanes Ridge, southwest of Iceland. Eventually they migrate to Denmark Strait near southeast Greenland to moult in late June or July. Seals that whelp in the Gulf, move to the north slope of the Laurentian Channel where they feed before migrating out the Cabot Strait and along the shelf-edge of the Grand Banks enroute to Denmark Strait.

The nursing period of hooded seals is the shortest known, averaging only 4 days, during which the pups grow extremely fast, gaining 7 kg/day. The blueback undergoes its first moult at approximately 16 months, although the 'blueback' pelage is retained until it is 2 or 3 years of age.

The Fishery

Commercial sealing for hooded seals at the Front was reported as early as 1874, but records of catches are lacking because no distinction was made between harp and hooded seals for many years. Following a shift to hunting for fur in the 1940s, the hooded seal pup, or blueback, became the most valuable of all pelts and hunting effort increased accordingly. Before implementation of quotas in 1974, annual catches varied greatly, ranging from less than 1,000 to just over 25,000 seals. From 1974-82 the harvest was fairly constant, averaging 12,800 per year, and made up primarily of pups taken during the large vessel hunt. Following the demise of this hunt, commercial catches varied from a low of 33 in 1986 to a high of 6,425 in 1991, averaging 1,048 for the period 1983-92. In recent years annual catches have continued to vary greatly with over 25,000 reported harvested in 1996. The highly variable number of hooded seals taken in any one year is likely due to the accessibility of the seals to land-based hunters.

Table I: TAC and commercial catches of hooded seals (,000s) in Atlantic Canada 1974-1996.

	1974 - 82	1983-92	1993	1994	1995	1996
TAC	**15.0**	**2.3 - 15.0[a]**	**8.0**	**8.0**	**8.0**	**8.0**
Catch	**12.80[b]**	**1.05[b]**	**0.02**	**0.15**	**0.86**	**25.70[c]**

[a] varied among years; see text for explaination
[b] annual average
[c] Preliminary figures

Prior to 1974 there was no TAC set for hooded seals, although there were restrictions on the hunting season. In 1974, a TAC of 15,000 was implemented for Canadian waters. During the late 1970s a number of regulatory changes were enacted to limit the percentage of adult females in the harvest. The TAC was reduced to 12,000 in 1983 and then further reduced to 2,340 in 1984. Hunting of bluebacks for commercial purposes and the use of vessels over 18 m was prohibited in 1987. In 1991 the TAC was increased to 15,000 and then set at 8,000 in 1992 where it presently remains. Hunting in the Gulf of St. Lawrence has been prohibited since 1964 and there are no catches of hooded seals in the Davis Strait whelping concentrations.

Hooded seals from all three whelping areas in the Northwest Atlantic are hunted in Greenland. From 1976 to 1985, catches were estimated to be about 6,000 seals per year. Unfortunately, the level of harvest from 1986 to 1992 is unknown, since information on catches is insufficient or lacking. Greenland has recently established a new harvest management program and, although the initial estimates obtained from this new program must be verified, it is estimated that approximately 7,000 seals were taken in both 1993 and 1994. These catch levels are similar to those observed in the late 1970s.

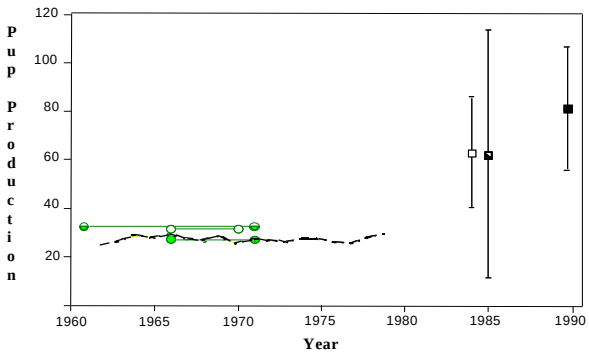
Historically, Northwest Atlantic hooded seals were also hunted at the moulting concentrations in the Denmark Strait, but this ended in 1967. An unknown number of hooded seals are incidentally caught in deepwater groundfish trawls in all areas of their range.

Resource Status

The total number of hooded seals in the Northwest Atlantic cannot be assessed directly because seals are distributed widely across the north Atlantic for most of the year. Even though adult seals congregate on the ice to whelp and to moult, the entire population is never visible at the surface at any one time. However, since all pups do remain on the ice for a short period of time while being nursed, hooded seal populations can be assessed by estimating the number of pups born.

In the Northwest Atlantic, the largest number of pups are born at the Front. A series of pup production estimates are available for this stock, but different methods were used and they are not all directly comparable. Pup production from 1966-1977 was estimated to be in the order of 25,000-32,000, based on either a survival index analysis or a sequential population analysis. The results of aerial surveys conducted in 1984 indicated that pup production was approximately 62,000 (95% C.I. 43,700-89,400). Although this estimate was higher than previous ones, little could be said about trends in pup production because of the different techniques used. Aerial surveys carried out in 1990 using methods similar to those used in 1984 produced an estimate of 83,000 (SE=12,600). Comparing the results of the 1984 and 1990 aerial surveys suggest that pup production has increased slowly at 5% per annum during the late 1980s. However, because of the wide confidence intervals the two estimates are not significantly different.

Fig. 1. Estimates of hooded seal pup production (thousands) at the Front 1966 - 1990 from cohort analysis (dashed line), survival index (circles and solid line) and aerial surveys (boxes).



The second most numerous stock of hooded seals in the Northwest Atlantic whelp in Davis Strait. The only estimate of pup production in this area, 18,600 (95% C.I. 14,000-23,000), was obtained from aerial surveys conducted in 1984.

The small number of hooded seal pups born in the Gulf of St. Lawrence have been surveyed several times in recent years. In 1990 pup production was estimated to be about 1,600 (SE=460), while in 1991 it was 2,000 (SE=190). The area was surveyed again in 1994, resulting in an estimate of almost 4,000 pups (SE=970). However, because of the short nursing period, survey estimates must be corrected for pups which were not present on the ice at the time. In 1994, the proportion of pups present on the ice during this survey was small, a large correction factor was

used and therefore, the estimate should be viewed with caution.

The total pup production for the Northwest Atlantic stock of hooded seals is unknown because the three whelping areas have not been surveyed in the same year and estimates obtained in different years cannot be combined without information on the degree of mixing. In the absence of such information, the ICES/NAFO Working Group on Harp and Hooded Seals agreed that a minimum pup production estimate of slightly over 84,000 (SE=12,600) was obtained by combining the 1990 estimates from the Front and Gulf. They noted that this is conservative since it does not include possible whelping in Davis Strait in 1990 or for changes in the total pup production since these surveys.

There is no recent population model available to estimate total population from the numbers of pups. However, based upon models developed for harp and grey seals which have similar biological characteristics, a pup production of about 84,000 would represent a total population in the order of 450,000 hooded seals.

Replacement Yield

The replacement yield is the number of seals that can be harvested in one year without changing the total population. In order to estimate a replacement yield, information on catch levels, age specific pregnancy rates, and mortality rates of adults and pups are needed. Although it has been difficult to obtain many of these data for hooded seals, the NAFO Scientific Council reviewed the available information on hooded seal population dynamics in June 1995 and estimated 1996 replacement yields in the order of 24,000 - 29,000 seals for the Northwest Atlantic. These estimates vary with the proportion of pups in the harvest (0-60%) and apply to catches in Canada and Greenland. It is important to note that these estimates are based upon a number of assumptions concerning the reproductive rates of hooded seals and the level of natural mortality. Therefore, estimates of replacement yield are sensitive to changes in these assumptions as well as the age of the catches.

Fisheries Interactions

Hooded seals spend considerable time in areas that are exploited by commercial fisheries in the Northwest Atlantic. Their diet has been determined by reconstructing the stomach contents of seals collected in the waters off Newfoundland using hard part such as fish otoliths. A total of 14 fish and 8 invertebrate prey groups were identified in the stomachs of hooded seals sampled in nearshore areas. Greenland halibut (*Reinhardtius hippoglossoides*) was the most important prey species making up 42% of the total wet weight of prey recovered. Other important species include redfish *(Sebastes spp,* 20.6%), Arctic cod (*Boreogadus saida,* 15.5%), Atlantic herring (*Clupea harengus,* 14.0%), squid (*Gonadus spp.*, 7.2%), and Atlantic cod (*Gadus morhua,* 1.2%). In offshore areas hooded seals consume a similar suite of prey species although the proportions of redfish (3.3%) and arctic cod (less than 1 %) taken were notably lower while the proportion of Atlantic cod was higher (10.1%). In addition to geographical differences, the diet of hooded seals varied on a seasonal basis, especially with respect to the proportion of redfish, herring and arctic cod present. Most of the fish consumed by hooded seals were 15 - 35 cm. Unfortunately, there is no information on the diet of hooded seals in the Gulf of St. Lawrence. Efforts to estimate the consumption of fish by hooded seals in the Northwest Atlantic are currently underway.

For More Information

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