

## The Harbour Seal Population in the Wadden Sea as Revealed by the Aerial Surveys in 2003

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Part of the Seal Agreement respectively the trilateral Seal Management Plan is the monitoring of the harbour seal population in the Danish, German (Schleswig-Holstein and Lower Saxony), and Dutch Wadden Sea by an annual series of aerial surveys. This year, the surveys had an extra dimension because of the occurrence of a seal epizootic in 2002. The results of the aerial surveys this year provide some insight into the impact on the seal population due to the mass mortality. For scientific reasons, it has been decided to compare the survey results between years based on the maximum count during the moulting season, which were obtained in all regions at the same time (Reijnders et al. 2003). In 2003, the maximum number of seals counted during the moult period (August) amounted to around 10,800 animals. This figure is composed of 1,160 seals in Denmark, 4,235 in Schleswig-Holstein, 3,050 in Lower Saxony and 2,365 in the Netherlands. It is possible that for some regions the maximum number counted sometime between June and August may differ from the

moult count. The maximum number of pups counted during the whelping period (June) was 2,956: Denmark 270, Schleswig-Holstein 1,407, Lower Saxony 799 and in the Netherlands 480.

It is obvious that the population paid a heavy toll, because 20,975 seals were counted in 2002. Until 2002, the Wadden Sea seal population had been growing at the highest rate so far recorded for this species. That growth was interrupted by a new outbreak of the phocine distemper virus (pdv) disease. According to virologists, this pdv was very similar to the one that caused an outbreak in 1988. In order to assess the impact of the epizootic on the population, the actual counts this year are compared with the expected population counts had no epizootic occurred. If the average annual growth rate, achieved in the pre-epizootic period, (1995-2001) had continued, the expected August count for 2003 would have been approximately 23,000 seals. The population in 2003 is 53% less than it could have been without the disease. Though this is

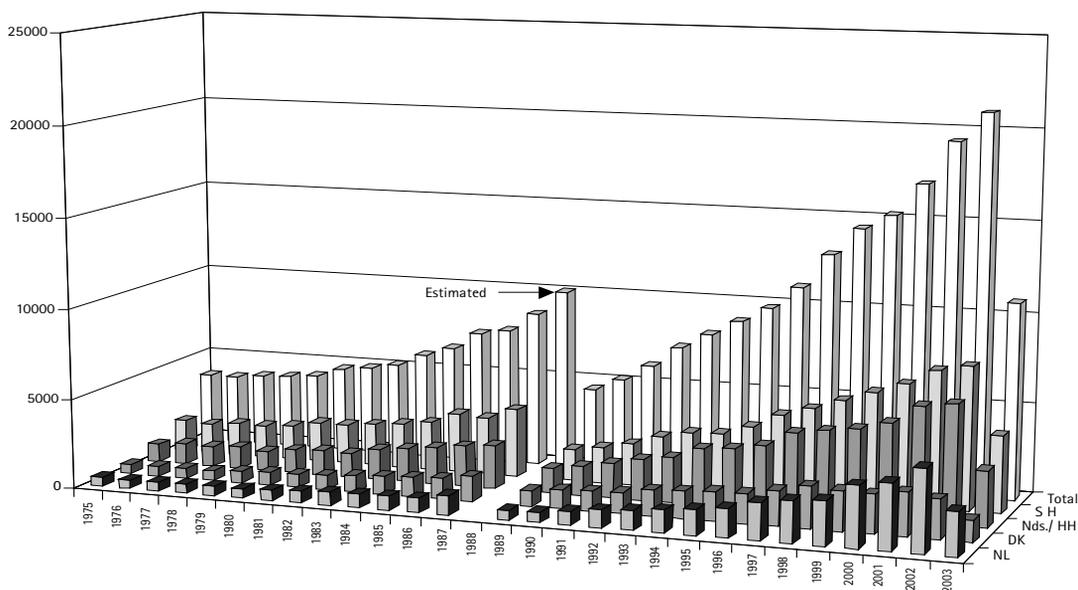


Figure 1:  
Number of counted common seals in the Wadden Sea since 1975

an impressive loss in comparison to the impact of the former epizootic in 1988 (number counted in 1989 58% less than expected), the relative mortality this time is evidently lower. This difference can be attributed to the fact that a fraction of the population was composed of animals that survived the 1988-epizootic and was immune to this virus. It cannot be excluded that differences in the epidemiology of this virus had an effect as well.

It would be interesting to assess how many animals died and what percentage has actually been found dead. To do so, the counts in 2002 and 2003 have first to be corrected for animals missed during surveys due to diving e.g. Then, the assumed number of survivors plus the number of pups born in 2003 should equal the population size in 2003. That way it has been calculated that probably around 15,500 animals died in the Wadden Sea. This is subject to the assumption that the counted animals have the same chance to be hit by the epizootic as the animals that did not haul out at the moment the survey was carried out. Given a total number of about 10,660 seals found dead, the ratio between seals found dead and estimated to have died is approximately 70%.

What about the future development of the seal population?

The growth rate over the next couple of years is difficult to predict precisely. This strongly depends on the extent of the perturbation of the age distribution, which is still unknown. A positive observation is the reproductive outcome this year. It is conceivable that successful mating and later implantation might have been hampered, as the epizootic was still in progress during the mating period. The counts indicate that this is not the case. Reproductive success can, e.g., be assessed

by expressing the number of pups counted per total number counted. The average (geometric mean) for the pre-epizootic period (1990-2001) is 22.0%, for 2003 it is 27.3%. It is hypothesized that this percentage is so unusually high because adult males experienced a higher mortality during the epizootic than adult females. Therefore the August count (when males generally dominate the survey results) may have been lower, resulting in an unusually high birth rate. This supposition is supported by the finding in Germany and the Netherlands that males were over-represented in the composition of the animals found dead during the epizootic in 2002. Anyway, it is safe to conclude that the reproductive performance of the adults surviving the epizootic is as good as it was in the pre-epizootic period. The high birth rate in 2003 offers a justified prospect for an unusually high population increase (15-20%) for 2004. That is a good start and allows for a prudent expectation of a quick recovery of the population from the blow in 2002.

## Reference

Reijnders, Peter, Sophie Brasseur, Kai Abt, Ursula Siebert, Svend Tougaard & Ekkehard Vareschi 2003. Sense and sensibility in evaluating aerial counts of harbour seals in the Wadden Sea. Wadden Sea Newsletter 2003 (1): 9-12.

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