

Aerial surveys of Harbour Seals in the Wadden Sea in 2010 **Strong increase in pups, slight increase in total number**

Introduction

In 2010 the coordinated aerial surveys for the harbour seal counts of the Wadden Sea were performed as usual. The counts are synchronised between the three Wadden Sea countries: Denmark, Germany and the Netherlands in order to obtain a single estimate for the size of the entire Wadden Sea population, and the number of pups born. As seals are counted when hauling out on sandbanks, counts are carried out when low-tide occurs during midday.

Results and Interpretation

The counts for 2010 seem to give conflicting messages when comparing to counts in 2009: an impressive increase in pup counts in June (+20%) but a lower maximum number in August (-1%). During the peak in pupping in June, a total of 6,536 pups were counted: 564 in Denmark, 2,873 in Schleswig-Holstein, 1,648 in Lower Saxony/Hamburg, and 1,451 in the Netherlands.

The maximum number of harbour seals counted in the Wadden Sea during the moult in August 2010 summed up to 21,375. This number is composed of 2,827 in Denmark, 8,309 in Schleswig-Holstein, 5,191 in Lower Saxony/Hamburg and 5,048 in the Netherlands. The count for the Netherlands is an underestimate as an area could not be surveyed due to military activities. A comparison with previous counts indicates that approximately 800 animals were missed. Taking this into consideration and correcting the counts accordingly, the best estimate for the number of harbour seals present on the sandbanks in the Wadden Sea during the moult in 2010 would be 22,175. Therefore, only a slight growth of nearly 3% could be noted.

Only in Schleswig-Holstein showed an increase during the moult compared to the counts in 2009. Here the highest numbers ever were reported (almost 21% higher than in 2009). Because no survey data for Schleswig-Holstein were available for late August, it was not possible to provide a total count for the population in that period. One can only speculate on other factors affecting the number of animals on land, such as disturbance, the necessity for the seals to feed further away limiting the amount of time to haul out, or a change in the composition of the population. Seals are known to haul out more when moulting. However animals of different age and sex do not moult at the same time (Härkönen *et al.* 1999). Changes in the composition of the population would therefore result in shifts of peak numbers. As it is not possible to discern the different age and sex classes during the aerial surveys, this cannot be tested.

Based on these results, it is tempting to conclude that the population is approaching the carrying capacity of their habitat and growth is continuing to slow down. This was pictured in the past years' report (TSEG 2009). However, the growth in number of pups disputes this deduction. When the population density becomes too high, a shortage of food and/or habitat is expected to affect female fertility resulting in fewer pups born. In 2010, on the contrary, number of pups had grown 20% compared to the previous year. Given the likelihood of an underestimate of the maximum numbers counted, the pup index 28.6 % is most probably unrealistic. The pup index is calculated as the percentage of pups in relation to the total number of seals counted during the moult.

Despite the uncertainties about the counting results in 2010, an estimate for the total Wadden Sea harbour seal population - corrected for the animals not observed whilst in the water (TSEG 2009) - can be made and would result in an estimated population size of 32,600 animals.

References:

Härkönen T, Harding KC, Lunneryd SG (1999) Age- and sex-specific behaviour in harbour seals *Phoca vitulina* leads to biased estimates of vital population parameters. *Journal of Applied Ecology* 36: 825-841

TSEG (2009) Aerial Surveys of Harbour Seals in the Wadden Sea in 2009: Growth of the harbour seal population slowing down? Trilateral Seal Expert Group (TSEG) (15 October 2009), Common Wadden Sea Secretariat, Wilhelmshaven, <http://www.waddensea-secretariat.org/news/news/Seals/Annual-reports/seals2009.html> [access 03 March 2011]

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