

Aerial surveys of Harbour Seals in the Wadden Sea in 2012

- Substantial increase in moult counts

In 2012 the coordinated aerial surveys for the harbour seal counts of the entire Wadden Sea were performed as in previous years (started in 1975). The counts are synchronised between the three Wadden Sea countries: Denmark, Germany and the Netherlands in order to obtain a single estimate for the number of harbour seals in the entire Wadden Sea, and the number of pups born. Seals are counted when hauling out on sandbanks and counts are carried out when low-tide occurs during midday.

Results and Interpretation

In August 2012 a total of 26,220 seals were counted, corresponding to an increase of 11% compared to 2011*. This figure indicates a solid increase in the number of seals, not far from the theoretical maximum annual growth rate of harbour seal population of 13% per year (Härkönen *et al.* 2002). The number of pups born in 2012 did not show as large an increase as the moult counts; during the peak pupping in June, a total of 7,267 pups were counted, equivalent of an increase of 3% compared to last year's count.

The total count of 26,220 harbour seals in the Wadden Sea was composed of 3,966 in Denmark, 9,268 in Schleswig-Holstein, 6,457 in Lower Saxony and Hamburg and 6,529 in the Netherlands. The general increase of 11% is unevenly distributed; in Denmark there was an increase of 28%, in Schleswig-Holstein the increase was 10%, the counts in Lower Saxony and Hamburg increased by 37% while numbers in the Netherlands dropped by 12%.

This may mean that the distribution of seals has shifted towards the east compared to 2011, when in the Netherlands an increase of 20% was observed compared to 2010, and other areas hardly grew. This underlines that the harbour seal population in the Wadden Sea consists of a continuum where seals move around possibly to optimise feeding and breeding, and avoid disturbance. This demonstrates the necessity to report population status for the coordinated flights in the entire area.

The increase in pupping over last year's pup-count was driven by higher numbers in Lower Saxony and Hamburg (+23%; 1977), while numbers in Denmark showed a pronounced decline (-18%; 570). The pup counts in Schleswig-Holstein (-0%; 3247- last year's count was based on a single survey) and the Netherlands (+0%; 1473) were almost identical to those from the last two years. Thus, the population increase of 2884 seals in August is well within the number of pups born (7267), and is therefore rather determined by the mortality in the various age groups, which may change from year to year depending on e.g. diseases, weather or food availability but also bycatch and other human related mortality. The pup-count was 28% of the moult count, and has ranged within 25-30% for the last four years. This percentage has not shown a declining trend over the years, another indication that the population has not approached carrying capacity.

The variation in the number of seals on land may be affected by disturbance, the necessity for the seals to feed further away limiting the amount of time to haul out, or a change in the age and sex composition of the population. Seals are known to haul out more frequently 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 the peak numbers. As it is not possible to discern the different age and sex classes during the aerial surveys, this cannot be tested.

This year's increase brings the average annual increase since the 2002 epidemic up to 10.4%, not far from the theoretical maximum rate. This suggests that the Wadden Sea

*: The count of 2011 has been adjusted by -443, as 443 seals counted on the Dutch surveys were mistakenly counted on the German side of the border

harbour seal population may still be considerably below the carrying capacity of the environment, although smaller growth rates in 2009 and 2010 gave rise to speculation that the population was approaching carrying capacity.

The estimate for the total Wadden Sea harbour seal population including seals in the water during the survey can be calculated using a correction factor estimated by Ries *et al.* (1998). They found that on average 32% of the seals were in the water at any time during the moult. Correcting for this results in an estimated total population size of about 38,500 harbour seals in 2012.

References

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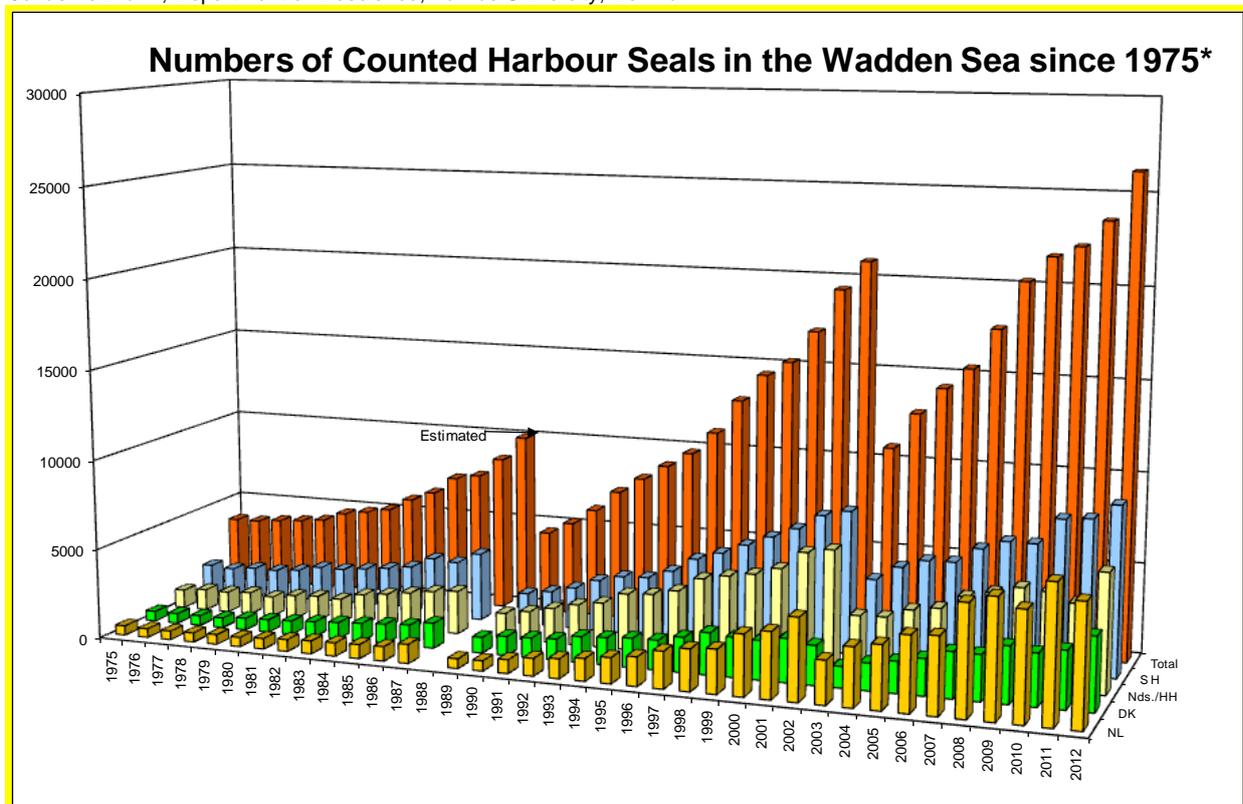
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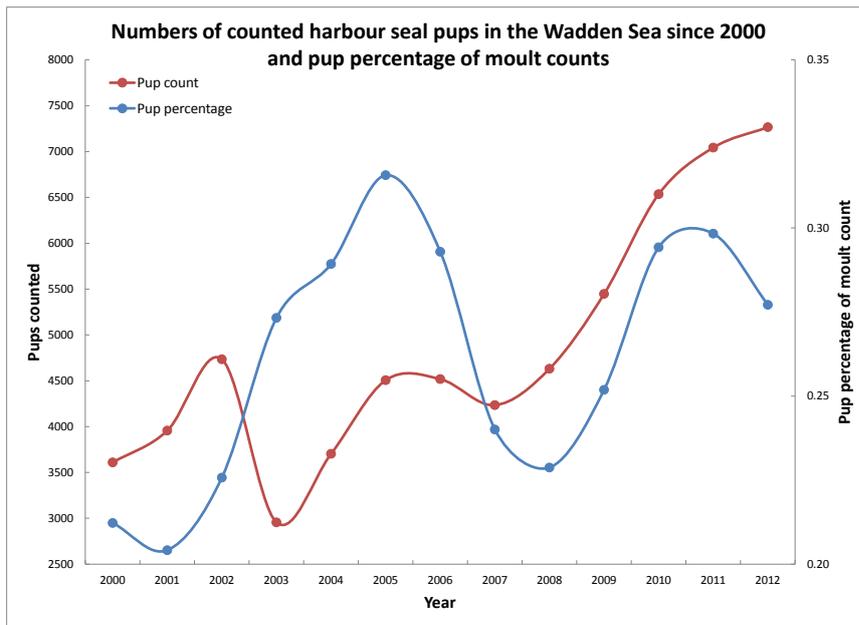
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