

# **Aerial surveys of Harbour Seals in the Wadden Sea in 2014**

The highest pup count recorded yet



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## Introduction

In 2014 the coordinated aerial surveys for harbour seal counts of the entire Wadden Sea were performed as in previous years (started in 1975) according to the Seal Management Plan. The counts are synchronized 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 land and counts are planned to be carried out when low-tide occurs around midday.

The variation in the number of seals hauling out from year to year and over a longer period may be affected by different weather conditions, disturbance, food availability close to the haul out sites, or a change in the age and sex composition of the population (Härkönen *et al.* 1999). Also, the timing of birth has been shown to change over time potentially affecting the percentage of pups counted at the same time of year over a long period (Reijnders *et al.* 2010).

## Results and Interpretation

In August 2014, 26,576 harbour seals were present on land. This number includes an estimated 950 seals in a section in the Netherlands not surveyed due to military activities. It constitutes a small decrease of less than 1% compared to 2013. The number of new born pups counted in June showed a massive increase compared to 2013: a total of 8,439 pups were counted, representing an increase of 21%, which is the highest number of pups ever counted in the Wadden Sea in terms of absolute numbers, as well as relative to the total population (32%, Figure 1).

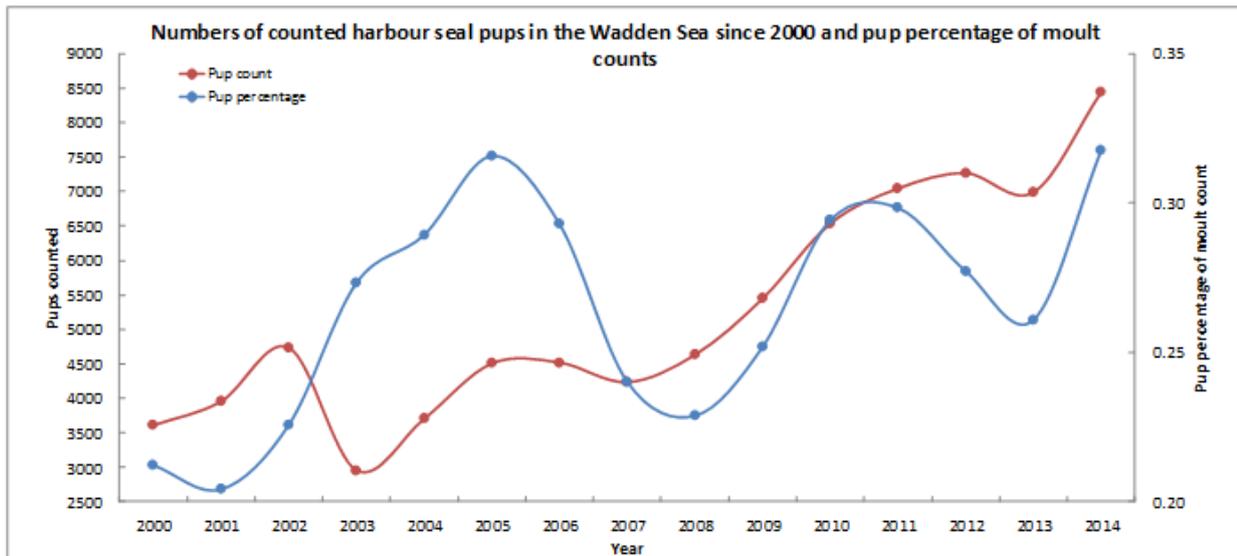


Figure 1. Number of pups counted in the Wadden Sea in June (red line, left vertical axis) in the years 2000-2014. The number of pups as a percentage of the total moult count if given by the blue line (right vertical axis).

The total moult count in the Wadden Sea was composed of 3,368 in Denmark, 9,174 in Schleswig-Holstein, 6,968 in Lower Saxony/Hamburg and 7,066 in the Netherlands (Figure 2). These detailed results reveal regional fluctuations compared to 2013: in Denmark there was an increase of 22%, in Schleswig-Holstein there was an increase of 10%, while there were decreases of 14% and 7% in Lower Saxony/Hamburg and in the Netherlands, respectively. This constitutes a shift in the moult distribution towards the eastern Wadden Sea. Last year the shift in distribution was towards the west compared with 2012 and of a similar magnitude to what was observed in 2014. These shifts may indicate that the spatial distribution of seals can shift over time or different proportions of seals hauling out in the different regions caused by variable environmental conditions for example

weather. This emphasizes that the harbour seal population in the Wadden Sea must be regarded as a whole.

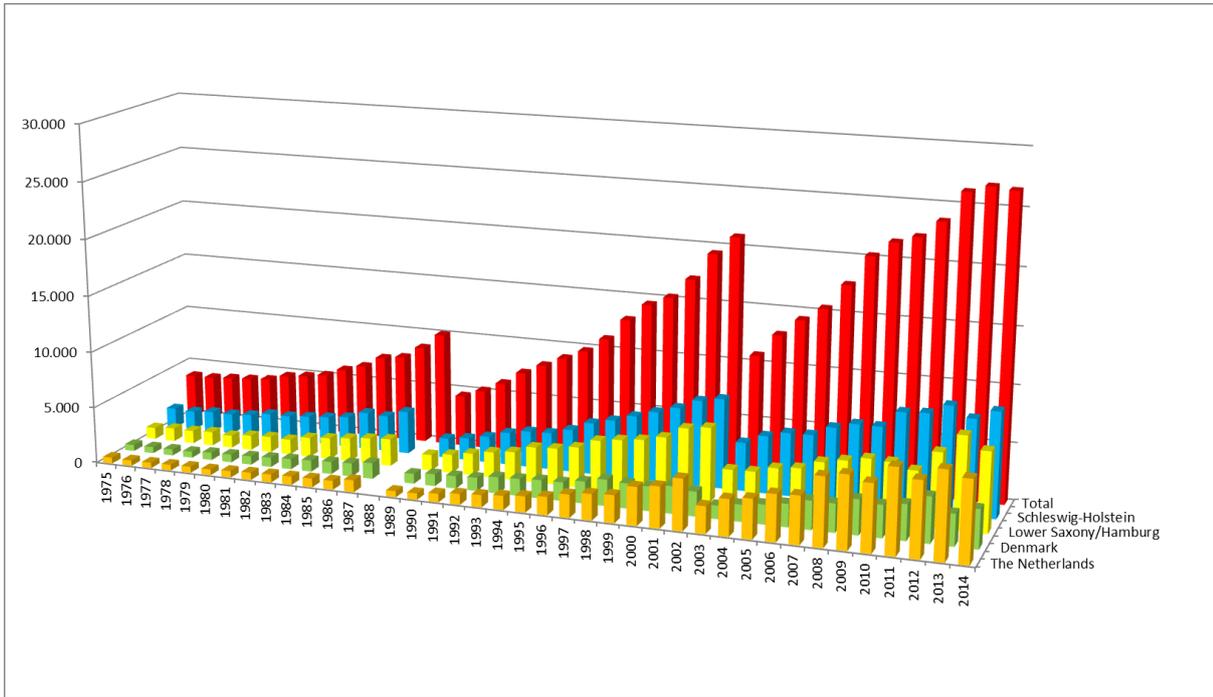


Figure 2. Total number of harbour seals counted in the Wadden Sea during the moult in August, as well as numbers broken down by region, for 1975-2014.

The high number of pups compared to June 2013 derived from pronounced increases in the western part with 51% in the Netherlands (1,856 pups) and 33% in Lower Saxony/Hamburg (2,067 pups), while smaller increases were recorded in the east with 5% in Schleswig-Holstein (3,853 pups) and 7% in Denmark (654 pups). This increase in pup counts follows a period of stagnation between 2010 and 2013 (Figure 1).

Since the last epidemic in 2002 the Wadden Sea harbour seal population showed an annual average growth of 7.7%. If the population growth rate is estimated using only two years, the variation caused by other factors than seal abundance (e.g. weather conditions, disturbance) may have a significant effect on the estimates. Such effects are much reduced if a longer sequence of years is used in the calculations (Meesters et al. 2007, Teilmann et al. 2010). During 2004-2008, recently after the 2002 epidemic, the average growth was 13.4%, which is the theoretical maximum annual growth rate of a harbour seal population (Härkönen et al. 2002). Since then, the sliding 5-year average growth rate has been decreasing (11.1% during 2005-9, 9.3% during 2006-10, 9.0% during 2007-11, 8.3% during 2008-12, 5.8% during 2009-13 and 4.3% during 2010-14). The decreasing growth rate might occur due to the harbour seal population approaching the carrying capacity of the current environmental conditions in the Wadden Sea or that the moulting peak has shifted over the years. This needs to be investigated further by exploring pup survival and the timing of the peak of the moult. If the high pup counts of 2014 are repeated in the coming years, this would also contradict an approach of the population to carrying capacity, unless this can be explained by an equivalent increase in pup mortality.

The recent increased mortality caused by the avian influenza H10N7 did not hit the Wadden Sea until after the completion of the annual counts and does therefore not have an effect on the data presented in this report.

The estimate for the total Wadden Sea harbour seal population, including seals being 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 during summer. By using this correction factor the total population size of harbour seals in the Wadden Sea in 2014 was about 39,100.

## References

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