



Photo: Harbour seal in shallow waters. K. Janke.

Trilateral surveys of Harbour Seals in the Wadden Sea and Helgoland in 2019

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Introduction

The seal counts of the entire Wadden Sea are synchronized to the degree possible between the three Wadden Sea countries, Denmark, Germany and the Netherlands, in order to obtain a single estimate for the number of harbour seals and newborn pups in the entire Wadden Sea. Seals are counted when hauling out on land and counts are scheduled 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, distance to food patches, 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). It is unclear if and how this shift might also affect the moult counts. Additional studies are needed to determine if a further shift in timing has occurred.

Results and interpretation

Pup counts

The number of newborn pups counted in June 2019 was the highest ever registered. A total of 9,684 pups were counted, constituting an increase of 2% relative to last year's count (2018) of 9,497 pups. These numbers cover a large decrease in Schleswig-Holstein (where the count was extraordinarily high in 2018) and increasing number of pups in the other regions. 919 pups were counted in Denmark (+64% from 2018). 3,723 pups were counted in Schleswig-Holstein (-19% from 2018), 2,711 in Lower Saxony and Hamburg (+26% from 2018) and 2,330 in the Netherlands (+6% from 2018). On Helgoland, one pup was found. The total for the Wadden Sea and Helgoland is the highest count yet recorded, and the number of pups as a percentage of the total August moult count is the second highest ever recorded (35%, Figure 1).

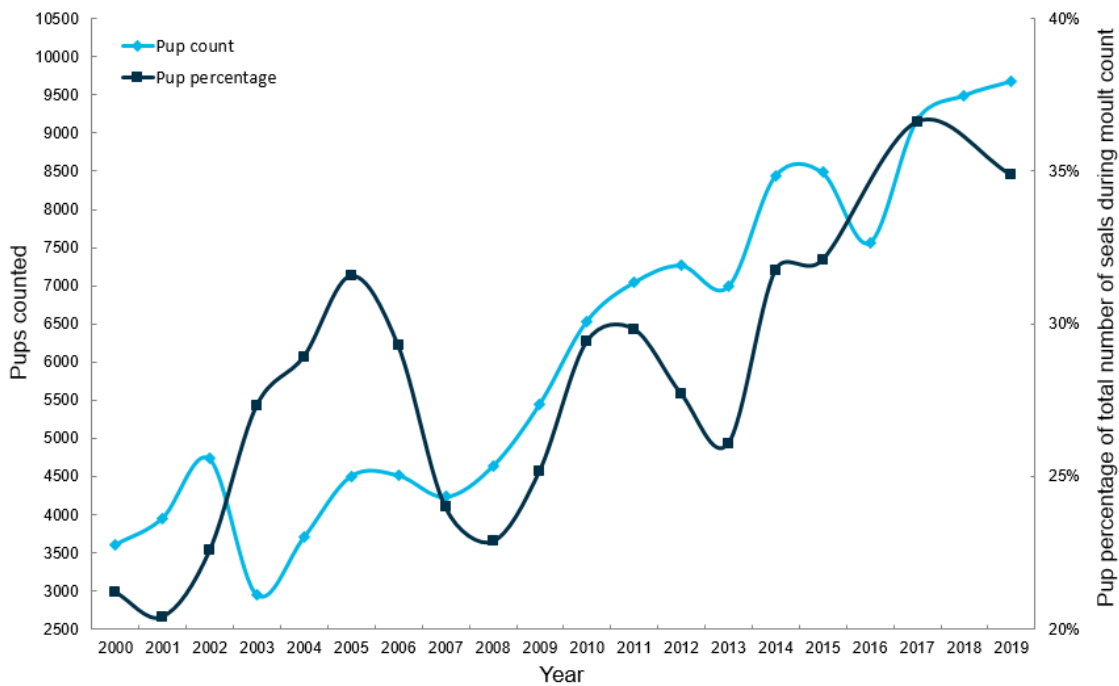


Figure 1. Number of pups counted in the Wadden Sea in June (left y-axis, light blue) in the years 2000-2019. The number of pups as a percentage of the total number of seals counted during the moult count (right y-axis, dark blue line.)

Moult counts

During the moult in August 2019, 27,763 harbour seals were counted in the Wadden Sea and Helgoland. This is a slight increase of 1% relative to last year's estimated count and the highest count yet recorded. Despite that, the result is a continuation of the stabilizing trend seen since 2012 where the average annual growth rate has been 0.4%. Between the last PDV outbreak in 2002 and 2012 there was a much higher annual growth (9.5%) (Figure 2). In 2019 in Denmark 2,676 seals were counted (+0% compared to 2018), in Schleswig-Holstein 8,721 (-1% compared to the last Schleswig-Holstein count in 2017) in Lower Saxony and Hamburg 8,772 (+9% compared to 2018) and 7,338 in the Netherlands (-7% compared to 2018, Figure 2). In Helgoland, 256 seals were counted compared to 193 in 2018 (+33%). Shifts in increasing or decreasing number of seals between areas may be the result of variations in the survey dates, a different proportion of seals hauling out on specific days in the different regions, caused by either variable environmental conditions (e.g. weather and tide). Finally, seals may move between areas. The latter emphasizes that the harbour seals in the Wadden Sea must be regarded as one large population.

The paradoxical trend of stabilizing moult counts and increasing pup counts observed since 2012 continues. In theory, one of the signs of a population approaching carrying capacity would be a decrease in pup production or pup survival. Obviously, the pup production is not declining, but rather has increased in recent years. We do not have comprehensive data on pup survival to investigate if a high rate of mortality for this age group can explain the observed paradox.

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 during August. By using this correction factor the total population size of harbour seals in the Wadden Sea and Helgoland in 2019 was about 40,800

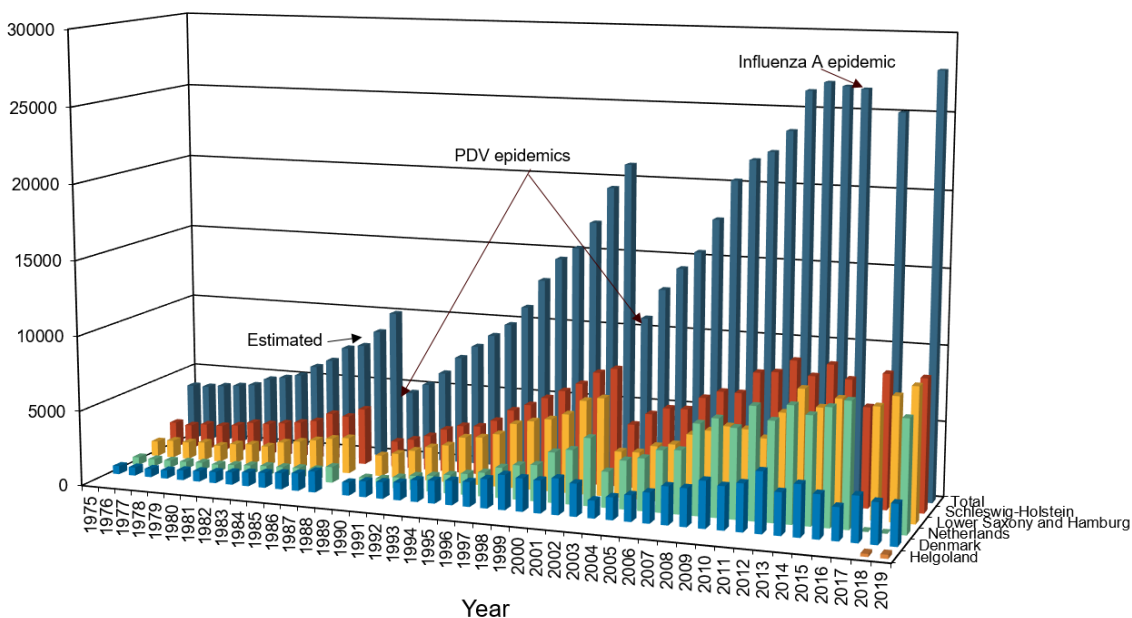


Figure 2. Total number of harbour seals counted in the Wadden Sea during the moult in August, as well as numbers for each region, from 1975 to 2019. In 2016 and 2018, parts of the Wadden Sea could not be surveyed on the coordinated date, resulting in missing total counts for these years. From 2018 on, data from Helgoland are included.

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