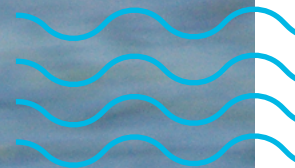




COMMON WADDEN SEA SECRETARIAT

SURVEY RESULTS OF HARBOUR SEALS IN THE WADDEN SEA IN 2025

Record high pup count despite recent decline in moult counts





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INTRODUCTION

Harbour seals that come on land in the Wadden Sea area are dependent on the Wadden Sea and adjacent North Sea waters where they feed, sleep and mate. Seals are, however, difficult to observe and count at sea, but accurate counts in the Wadden Sea can be done when they haul out on the sandbanks to rest, moult or breed. To obtain data on the population size in the Wadden Sea and on Helgoland, surveys of harbour seals and their pups, are coordinated between the three Wadden Sea countries: Denmark, Germany, and the Netherlands.

Harbour seals are counted during low tide around midday, when most seals are hauled out on land. These counts are conducted on dates coordinated among the responsible institutes of the Wadden Sea countries. Except for Denmark, where only one pup count is done, three counts are conducted during the pupping season in June around the peak in pup numbers to count pups and estimate pup production. During the moulting season in August, two counts are performed and all harbour seals on land are counted to estimate the total population abundance.

In addition to the seasonal peaks in numbers, the number of seals hauling out may be influenced by weather conditions, disturbance, distance to food patches, or changes in the age and sex composition of the population (Härkönen et al. 1999). Efforts are made to standardise the surveys and several consecutive surveys are carried out to reduce the interannual variation in number of seals observed on land. In the past, the timing of births has been shown to shift (Reijnders et al. 2010). It is important to study if such a shift or a shift in the timing of the moult will reoccur, as this could affect the results of the pup counts.

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RESULTS AND INTERPRETATION

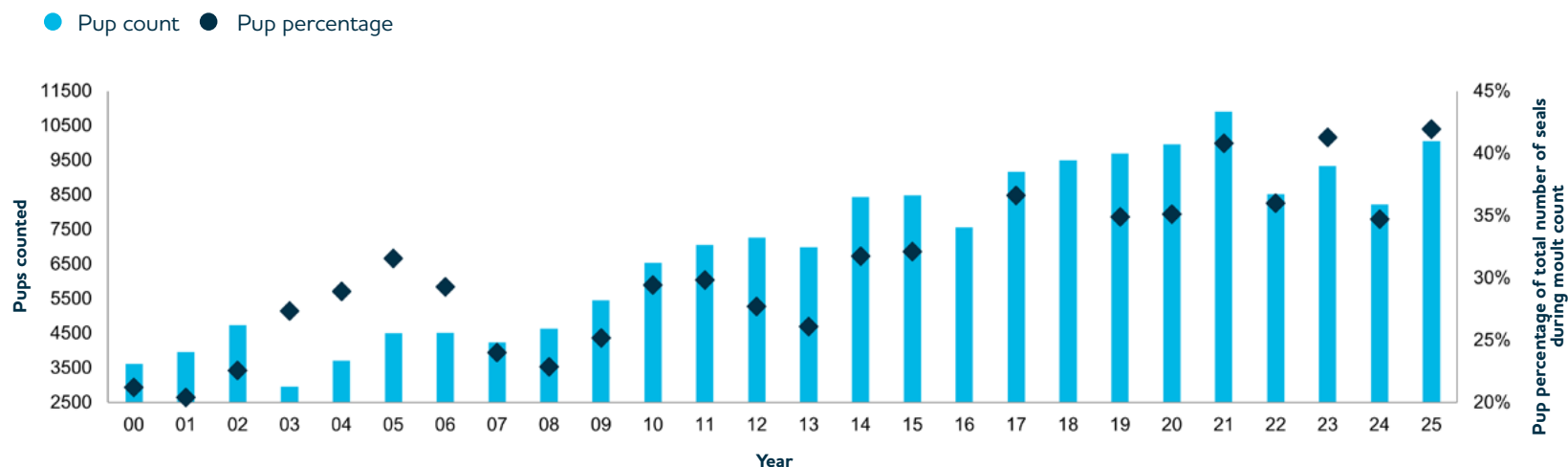
PUP COUNTS

After relatively low pup counts in 2022–2024, the 2025 surveys yielded the second highest pup count ever. A total of 10,044 pups were counted, an increase of 22% relative to the 2024 count of 8,230 pups (Figure 1). In Denmark however, there was a decrease of 4% relative to 2024 with 727 pups counted. In Schleswig-Holstein, there was an increase of 25% with 4,375 pups, and in Lower Saxony and Hamburg, there was also an increase of 25% with 2,131 pups counted. In the Netherlands, there was an increase of 44% relative to the unusually low count of 2024 with a 2025 count of 2,809 pups. On Helgoland, two pups were observed.

MOULT COUNTS

During the moult in August 2025, a total of 23,954 harbour seals were counted in the Wadden Sea area. This constitutes an increase of 1% relative to the count in 2024, although it is lower than all the counts from 2012–2021, indicating a continued decrease in abundance (Figure 2). In Denmark, counts decreased by 20% from 2024 to 1,721, in Schleswig-Holstein, they decreased by 8% to 7,806 and in Lower Saxony and Hamburg, they increased by 9% to 7,042. In the Netherlands they increased by 10% to 7,285. On Helgoland, 100 seals were counted compared to 56 in 2024.

Figure 1. Number of pups counted in the Wadden Sea in June (left y-axis, light blue bars) during the years 2000–2025. Dark blue diamonds (right y-axis) indicate the number of pups as a percentage of the total number of seals counted during the moult count surveys in August.



DISCUSSION

Because of possible variations in individual counts, long-term trends should be investigated rather than annual variation. While dropping since 2022, the results of 2025 represent the third successive year of counts that are substantially lower than those in 2012. Thus, after an exponential increase of 9% annually from 2003 to 2012 and a stagnating trend (+1% annually) from 2012 to 2020, there has been an average decreasing trend of -4% annually since 2020.

The percentage of pups as related to the moult count has generally been increasing substantially since 2000 (Figure 1). The numbers in 2025 presented the highest pup percentage yet recorded. The increasing pup numbers indicate an increase in pup production, thus a higher proportion of females breeding. The change in proportion could be the result of a change in the age structure of the population or a shift in haul out behaviour during the moult when total numbers are counted. Potentially climate change or lack of

food resources could force the seals to spend more time at sea foraging. In any case, the survey results indicate a population under pressure and a high pup mortality.

Effort is needed to understand the underlying mechanism for the high pup production paired with the decreased total abundance since 2020. Based on counts in the wider North Sea area, there is no indication of mass migration (ICES 2024) and there are no indications of mass mortality events in recent

years. Neither an increased number of dead harbour seals found stranded, nor have pathological examinations (carried out in Germany and Denmark) indicated a disease-related decline in the population. Potentially, lack of food and competition with harbour porpoises and recolonising grey seals could affect harbour seal pup survival. Moreover, some individual grey seals have been observed to predate on and have fatal sexual interactions with harbour seals (van Neer et al. 2015; Rohner et al. 2020). However, in the

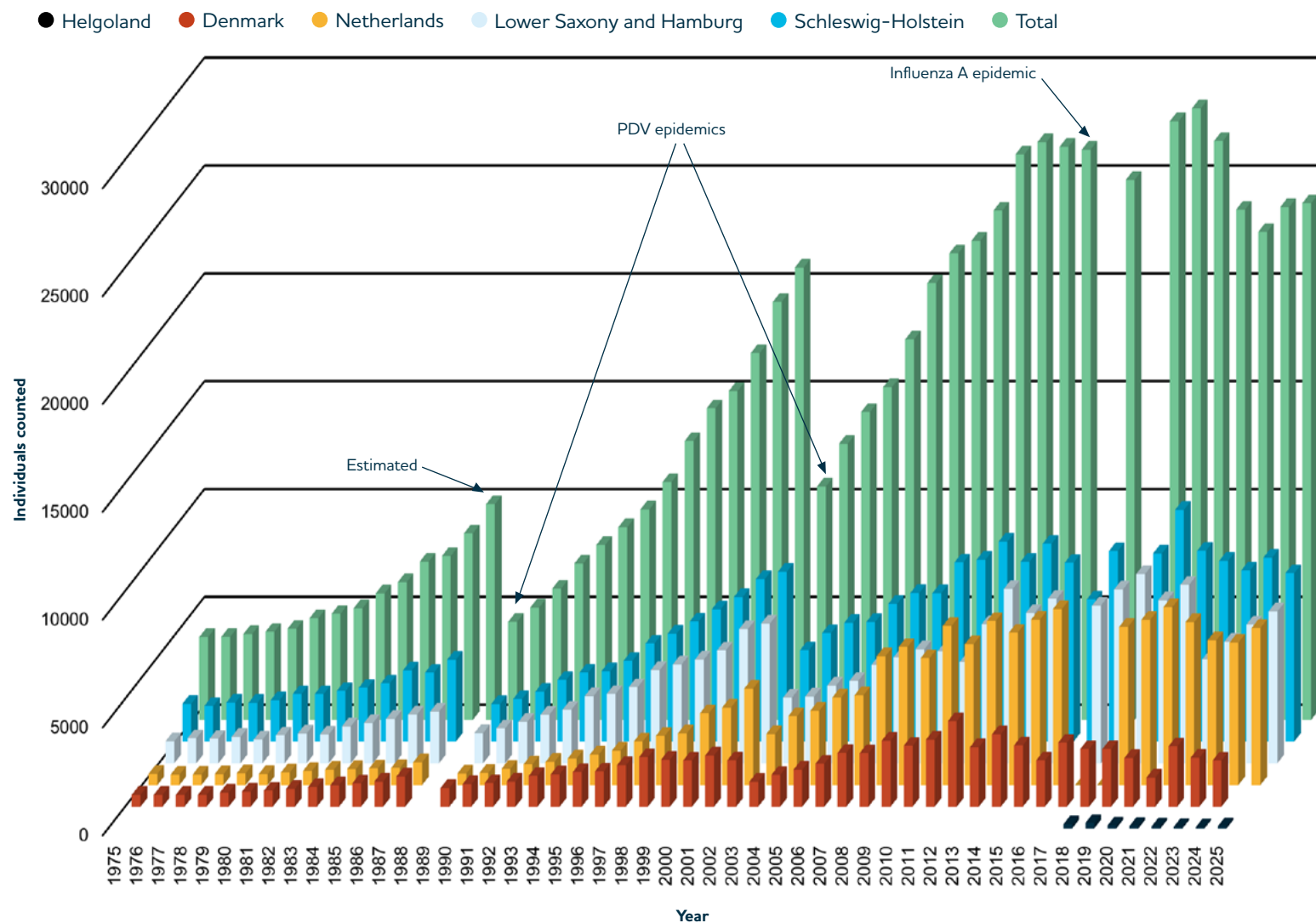
western Dutch Wadden Sea, where most grey seals are counted, harbour seal numbers are growing compared to the areas with fewer grey seals. In the North Sea, where harbour seals forage, offshore wind farms and general use of the marine coastal area have increased profoundly over the last decade, with potential detrimental effects on the harbour seals. However, effects might not be straightforward as, for example, individual seals have been observed to use wind farms and other structures to search for prey (e.g., Russell et al. 2014, 2016). Moreover, the area is subject to intensive fisheries, which may compete with harbour seals for food resources (Aarts et al. 2019), lead to bycatch and disturb sediments and bottom communities, degrading the habitat and its resources.

ESTIMATED POPULATION SIZE BASED ON COUNT RESULTS

The total abundance of the Wadden Sea harbour seal population, including seals in the water during the survey, can be estimated using data from Ries et al. (1998). They found that on average 32% of the seals were in the water during summer. Using this correction factor, the total population size of harbour seals in the Wadden Sea area in 2025 is around 35,200. However, the population might currently encounter different ecological conditions leading to changes in haulout behaviour compared to almost 30 years ago, and the correction factor might be inaccurate with respect to current conditions.

To ensure an optimal interpretation of the monitoring results additional flights are needed to ascertain when

Figure 2. Total number of harbour seals counted in the Wadden Sea during the annual moult in August, as well as number of seals for each region, from 1975 to 2025. In 2016 and 2018, parts of the Wadden Sea could not be surveyed on the coordinated dates, resulting in missing total counts for these years. From 2018, data from Helgoland are included.



the peaks in pupping and moulting occur and new studies should be carried out to determine if the correction factor for seals on land during the surveys is inaccurate under the current conditions.

CONCLUSION

In 2025, 10,044 harbour seal pups and 23,954 moulting seals were counted. After years of growth, the results for the Wadden Sea harbour seal population over the last decade indicate a change in population trend, initially a stagnation, then recently a decline despite high pup counts. The cause for this decline is still poorly understood, though the data indicate that pup survival is affected. It is therefore recommended to at least protect seals from disturbance during the breeding and suckling period and avoid unnecessary deaths due to for example bycatch. Still, further studies are needed to understand the underlying mechanisms for the observed changes in the Wadden Sea harbour seal population

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