COMMON WADDEN SEA SECRETARIAT

SURVEY RESULTS OF HARBOUR SEALS IN THE WADDEN SEA IN 2024

Sustained declines of both pups and moulting seals

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INTRODUCTION

Harbour seals observed in the Wadden Sea area are dependent on the North Sea coastal and adjacent offshore areas where they feed and spend most of their time. Seals are, however, difficult to observe or count at sea, whereas accurate counts can be done when they haul out on the sandbanks of the Wadden Sea to rest, moult and breed. To obtain an indication of the status of the population observed in the Wadden Sea, counts of harbour seals and pups hauled out in the entire Wadden Sea area (including Helgoland), 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 five dates coordinated among the responsible institutes. Three such counts take place during the pupping season in June, to count the pups to determine the peak in pup numbers 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.

In addition to these 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 effect of anomalies due to unforeseen events. Spanning decades, the timing of births has also been shown to shift (Reijnders *et al.* 2010). If not anticipated, this could affect the results of the pup counts.

Authors: Anders Galatius[1], Sophie Brasseur[2], Thea Hamm[3], Armin Jeß[4], Kristine Meise[5], Julia Meyer[6], Jessica Schop[2], Ursula Siebert[7], Ole Stejskal[8], Jonas Teilmann[1], Charlotte B. Thøstesen[9].

[1] *Department of Ecoscience, University of Aarhus, DK*
[2] *Wageningen Marine Research, University of Wageningen, NL*
[3] *National Park Lower Saxony, National Park Administration, D*
[4] *Schleswig-Holstein Agency for Coastal Defense, National Park and Marine Conservation, National Park Authority, D*
[5] *Common Wadden Sea Secretariat*
[6] *Environmental Authority of the free Hanseatic city of Hamburg, National Park Administration, D*
[7] *Institute for Terrestrial and Aquatic Wildlife Research, University of Veterinary Medicine, D*
[8] *Niedersächsisches Landesamt für Verbraucherschutz und Lebensmittelsicherheit, Institut für Fische und Fischereierzeugnisse, D*
[9] *Esbjerg Fishery- and Maritime Museum, DK*

RESULTS AND INTERPRETATION

PUP COUNTS

In 2024, a total of 8,230 pups were counted, a decrease of 12% relative to the 2023 count of 9,334 pups (Figure 1; Galatius *et al.* 2023). In Denmark, there was an increase of 14% relative to 2023 with 758 pups counted. In Schleswig-Holstein, there was a decrease of 19% with 3,497 pups, and in Lower Saxony and Hamburg, there was a decrease of 2% with 2,019 pups counted. In the Netherlands, there was a decrease of 15% with 1,956 pups counted. On Helgoland, no pups were observed. The total number of pups counted in the Wadden Sea area are now lower than ten years ago.

MOULT COUNTS

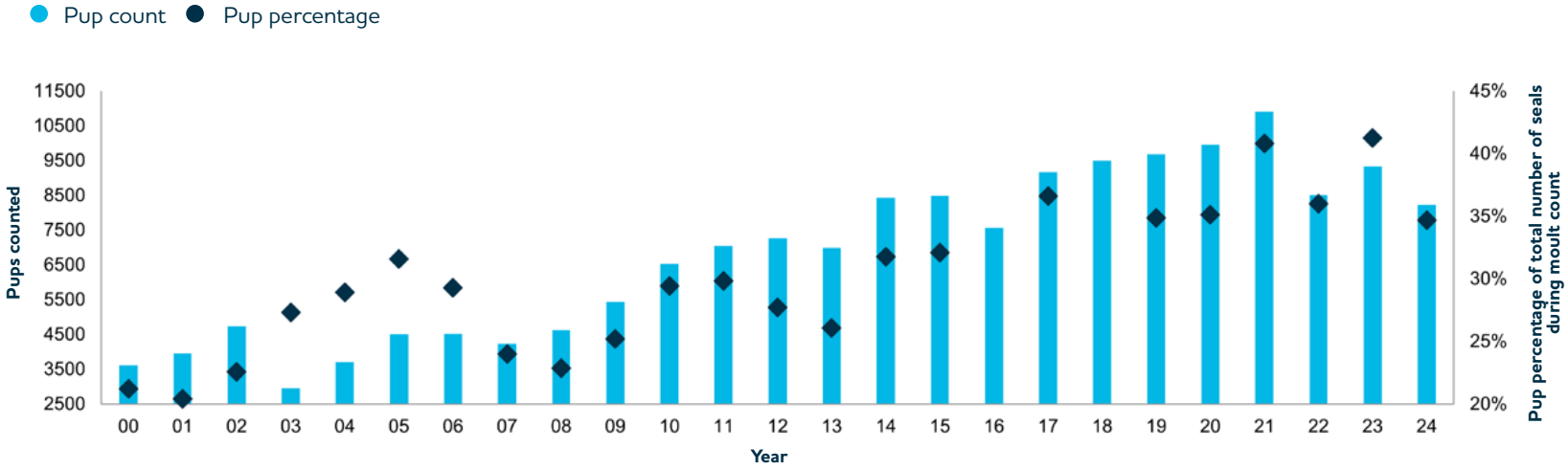
During the moult in August 2024, a total of 23,772 harbour seals were counted in the Wadden Sea area. This constitutes an increase of 5% relative to the count in 2023 (Galatius *et al.* 2023), although, like the counts of 2022 and 2023, it is lower than all counts from 2012-2021, indicating a decrease in abundance since this period (Figure 2).

In Denmark, counts decreased by 6% from 2023 to 2,143, in Schleswig-Holstein, they increased by 7% to 8,531 and in Lower Saxony and Hamburg, they increased by 14% to 6,438. In the Netherlands they decreased by 2% to 6,604. At Helgoland, 56 seals were counted compared to 72 in 2023.

Because of possible variations in individual counts, long-term trends should be investigated rather than annual variation. Still, the 2024 counts represent the third successive year of substantially lower counts. Thus after exponential increase at 9% annually from 2003 to 2012 and a stagnating trend (+1% annually) from 2012 to 2020, there has been a decreasing trend of -5% annually since 2020. The percentage of pups as related to the moult count has generally been increasing since 2000 (Figure 1), indicating a relative increase in pup production. This could be because the age structure of the population has been changing, potentially because of increased pup mortality.

Effort is needed to understand the underlying mechanism for the high pup production paired with the decreasing abundance since 2020. Based on counts in the wider North Sea area, there is no indication of mass migration (see ICES 2024) and there have not been mass mortality events in recent years. Neither the number of dead harbour seals found stranded, nor the pathological examinations (carried out in Germany and Denmark) have indicated a disease-related decline in the population. Potentially, competition with harbour porpoises and recolonising grey seals, could affect harbour seal abundance. Grey seals have also 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 the majority of 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,

Figure 1



Number of pups counted in the Wadden Sea in June (left y-axis, light blue bars) during the years 2000-2024. 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.

attraction to wind farms and other structures have also been detected (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) and disturb sediments and bottom communities, degrading the habitat and its resources.

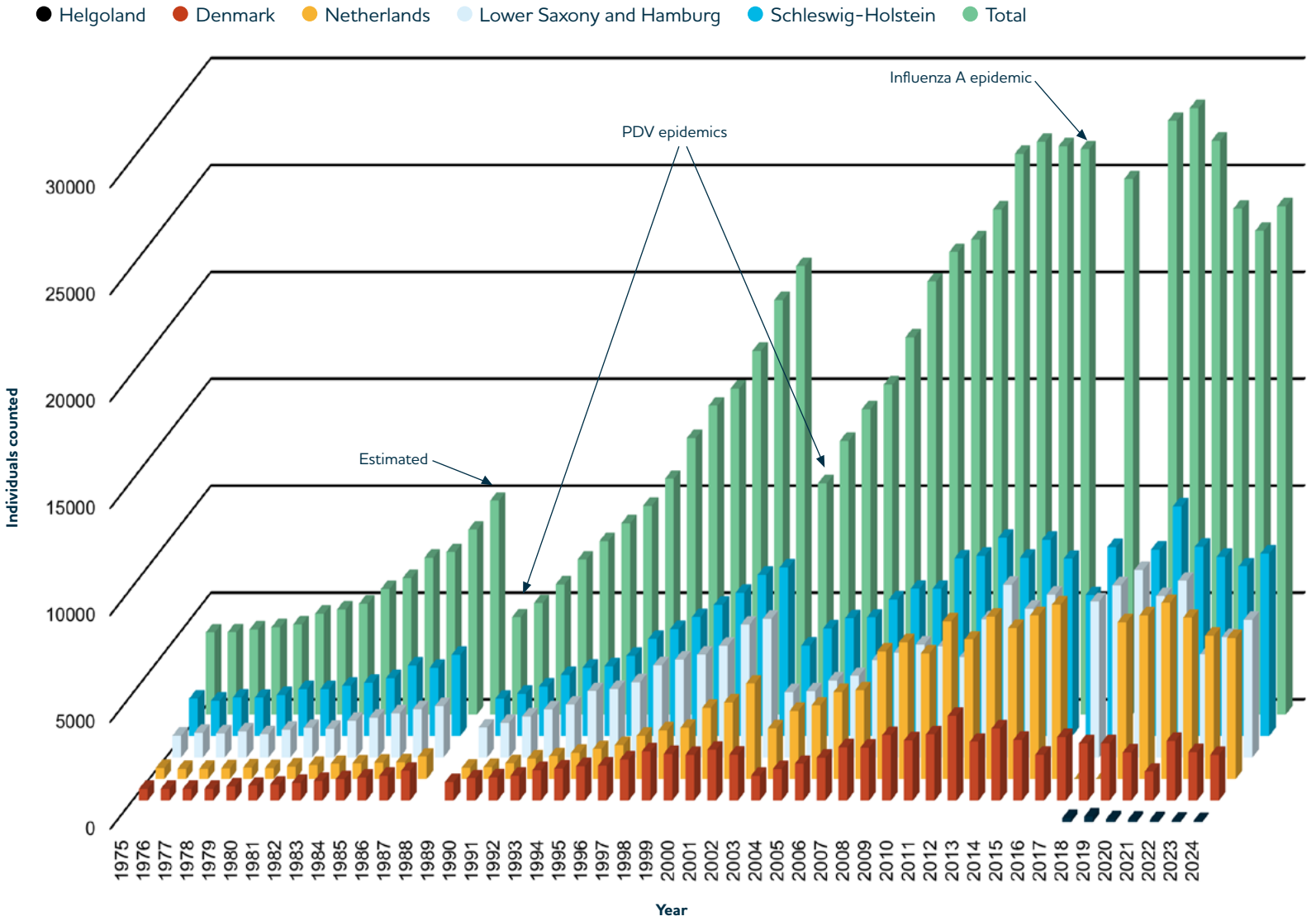
ESTIMATED POPULATION SIZE BASED ON COUNT RESULTS

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 2024 is around 34,900. However, the population might currently encounter different ecological conditions compared to almost 30 years ago, and the correction factor might be inaccurate with respect to current conditions. To determine if this is the case, new studies and additional flights are needed to ascertain when the peaks in pupping and moulting occur and to determine the proportion of seals on land during the surveys.

CONCLUSION

In 2024, 8,230 harbour seal pups and 23,772 moulting seals were counted. The results from the last decade indicate a change in population trend and a decline over the last five years in the Wadden Sea harbour seal population. Studies are needed to understand the underlying mechanisms for these changes.

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 2024. 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.

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