

COMMON WADDEN SEA SECRETARIAT

HARBOUR SEAL SURVEYS IN THE WADDEN SEA AND HELGOLAND 2021



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HARBOUR SEALS SURVEY

INTRODUCTION

The harbour seal counts are synchronized to the degree possible between the three Wadden Sea countries, Denmark, Germany and the Netherlands, in order to obtain a combined estimate for the number of harbour seals and newborn pups in the entire Wadden Sea and Helgoland. Harbour seals are counted when hauling out on land and counts are scheduled to be carried out when low tide occurs around midday. The counts are carried out on five coordinated dates. The counts are carried out on five coordinated dates: three counts during the pupping season in June and two during the moulting season in August. In June the number of pups is counted and in August the total number of harbor seals is counted in the respective regions.

The variation in the number of seals hauling out from year to year and over longer periods 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 each year over a long period (Reijnders et al. 2010). It is unclear if this shift continues in the Wadden Sea and if there is also a shift in timing of the moult. Additional studies are needed to determine when the peak in birth and moult occurs.

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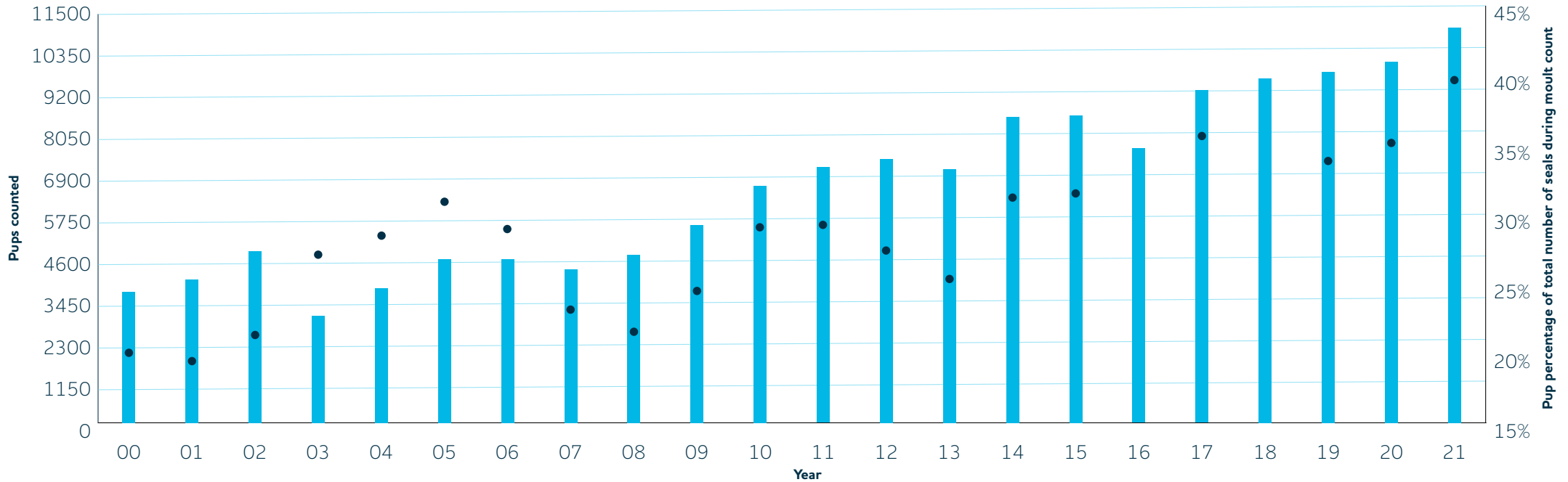
STABLE POPULATION ABUNDANCE

RESULTS AND INTERPRETATION

The number of newborn pups counted in June 2021 was the highest ever recorded, both in absolute terms and as a fraction of the moulting population (41%). A total of 10,903 pups were counted, constituting an increase of 10% relative to the 2020 count of 9,954 pups. In Denmark there was a large increase compared to an extraordinarily low count in 2020 (656 pups in 2021, +53% more than in 2020) and we also observed a considerable increase

in pups counted in Schleswig-Holstein (5096 pups in 2021; +13% from 2020). On Helgoland one pup was registered, this is the first time for a birth to occur at a coordinated monitoring date, since Helgoland has been integrated in the trilateral harbour seal monitoring in 2018. The count in Lower Saxony and Hamburg saw an increase of 6% with 2621 pups counted, while in the Netherlands, the count was similar to 2020 with 2529 pups counted (a drop of 1%).

Figure 1
● Pup count ● Pup percentage



Number of pups counted in the Wadden Sea in June (left y-axis, light blue bars) in the years 2000-2021. The number of pups as a percentage of the total number of seals counted during the moult count in August (right y-axis, dark circles).

During the moult in August 2021, a total of 26,838 harbour seals were counted in the Wadden Sea and Helgoland. This is a decrease of 5% relative to the count in 2020 and a continuation of the stabilizing trend seen since 2012, with an average annual growth rate of 1.0%. After

the last PDV outbreak in 2002 up to 2012, there was a much higher annual growth rate of 8.1% (Figure 2).

In 2021, counts of moulting harbour seals decreased in the northern part of the Wadden Sea and increased in the south relative to the 2020 counts. In

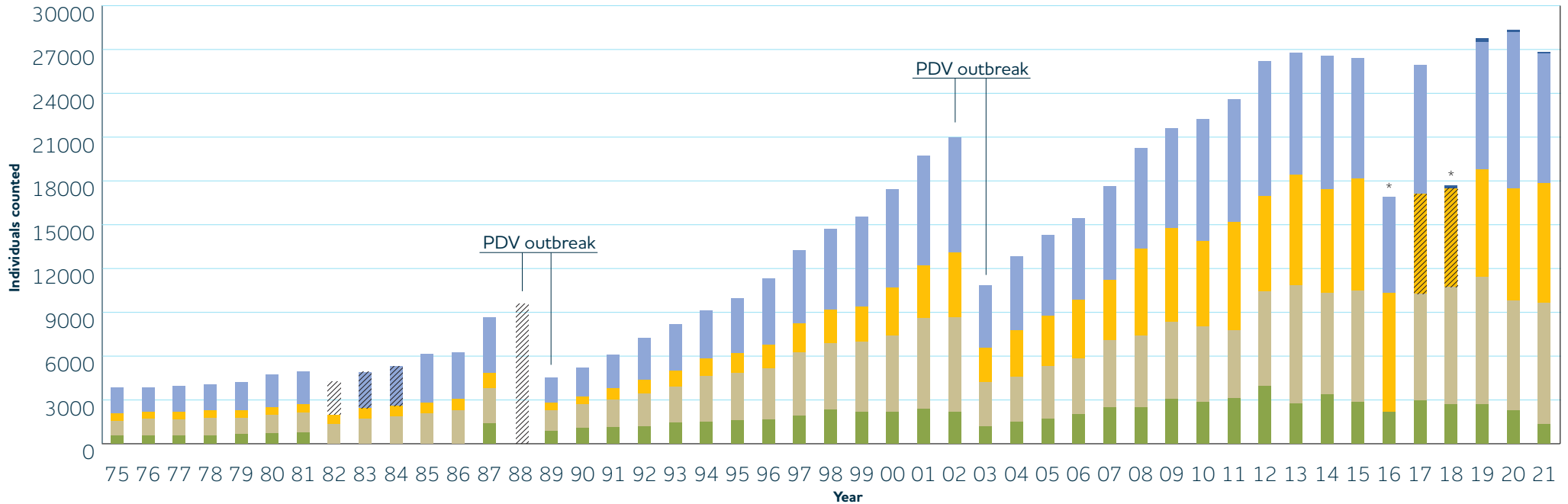
Denmark only 1,355 seals were counted, a drop of 40% compared to 2020. Counts in Denmark have been decreasing since 2016 with an annual rate of 9%. In Schleswig-Holstein, 8,849 seals were counted (-18% compared to 2020) and at Helgoland, 117 seals were counted (-14% compared to 2020). In Lower

Saxony and Hamburg numbers increased to 8,272 (+10% compared to 2020) and in the Netherlands to 8,245 (+8% compared to 2020, Figure 2). Annual variation in numbers of seals between areas during the moult may be the result of variations in the survey dates, or a different proportion of seals hauling out

on specific days in the different regions, caused, for example, by variable environmental conditions (e.g. weather and tide). Finally, seals may move between areas. This emphasizes that the harbour seals in the Wadden Sea must be regarded as one large population.

Figure 2

● Denmark ● Schleswig-Holstein ● Helgoland ● Lower Saxony and Hamburg ● Netherlands



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 2021. 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. Since 2018, harbour seal data from Helgoland are being integrated in the trilateral monitoring because of growing numbers on the island. The ingraved bars are estimated numbers. *The star indicates year where no total counts are available due to missing data from some Wadden Sea regions.



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The paradoxical trend of stabilizing moult counts compared to high and increasing pup counts observed since 2012 continues. In theory, one of the signs of a population approaching carrying capacity, caused by limited food resources, would be a decrease in pup production. This is not what we see and the delay in recruitment of sexually maturing females cannot explain what we have observed for 10 years. As demonstrated, the pup production in the Wadden Sea is not declining, but it is high and 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 or possibly other population mechanisms that may occur.

The estimate of 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 summer. By using this correction factor, the total population size of harbour seals in the Wadden Sea and Helgoland in 2021 is estimated at about 39,500. Given that the correction factor was established using data obtained 27 years ago, and the population might encounter different ecological conditions, it may not accurately reflect the proportion of harbour seals in the water today. New studies on the number of seals not visible during the surveys are needed to ensure that the population is estimated accurately.

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