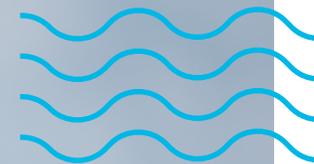


COMMON WADDEN SEA SECRETARIAT

GREY SEAL NUMBERS IN THE WADDEN SEA AND ON HELGOLAND IN 2023-2024



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GREY SEAL SURVEYS

INTRODUCTION

Since 2008, annual coordinated surveys have been conducted to count grey seals on sandbanks in the Wadden Sea and Helgoland across the Netherlands, Germany, and Denmark. Grey seal pups are counted during the pupping season from November to January and the overall numbers of grey seals are counted during the moulting season in March and April. To ensure more precise trend analysis, we use the dates with the largest numbers of grey seals counted within the shortest possible timeframe across the Wadden Sea. This minimises the chance of double-counting individuals moving between haul out sites. Aerial surveys covered all

survey areas except for Helgoland, where land-based counts were conducted during the grey seal moult.

Grey seals in the Wadden Sea and on Helgoland are part of the wider North Sea population, with some exchange occurring between haul out sites within this region (Brasseur *et al.*, 2015; 2022). It was recorded, that some pups born in the UK were taken by storms to the continent during winter. These pups could be included in the pup counts and as they reach adulthood, they are likely to breed in the area they washed up, explaining for example the recolonisation process of the Dutch Wadden Sea area starting in the 1980s (Brasseur

et al., 2015). During moult, adults from other North Sea colonies also haul out in the Wadden Sea area, potentially affecting trilateral counts (Brasseur *et al.*, 2015). Thus, those counts do not solely represent a local management unit, but also the use of the Wadden Sea area by other North Sea grey seals. As a proportion of seals is at sea during the surveys, the data should not be viewed as absolute numbers but rather as an index for assessing trends in grey seal numbers and pup production over time in the Wadden Sea. These trends are best interpreted over several years due to annual fluctuations caused by weather, disturbance or other local and regional factors.

Authors: Jessica Schop¹, Sophie Brasseur¹, Anders Galatius², Thea Hamm³, Armin Jeß⁴, Kristine Meise⁵, Julia Meyer⁶, Ole Stejskal⁷, Ursula Siebert⁸, Jonas Teilmann², Charlotte B. Thøstesen⁹.

¹Wageningen Marine Research, University of Wageningen, NL

²Department of Bioscience, University of Aarhus, DK

³National Park Lower Saxony, National Park Administration, D

⁴Schleswig-Holstein Agency for Coastal Defense, National Park and Marine Conservation, National Park Authority, D

⁵Common Wadden Sea Secretariat

⁶Environmental Authority of the Free Hanseatic City of Hamburg, National Park Administration, D

⁷Lower Saxony State Office for Consumer Protection and Food Safety, D

⁸Institute for Terrestrial and Aquatic Wildlife Research, University of Veterinary Medicine, D

⁹Esbjerg Fishery- and Maritime Museum, DK



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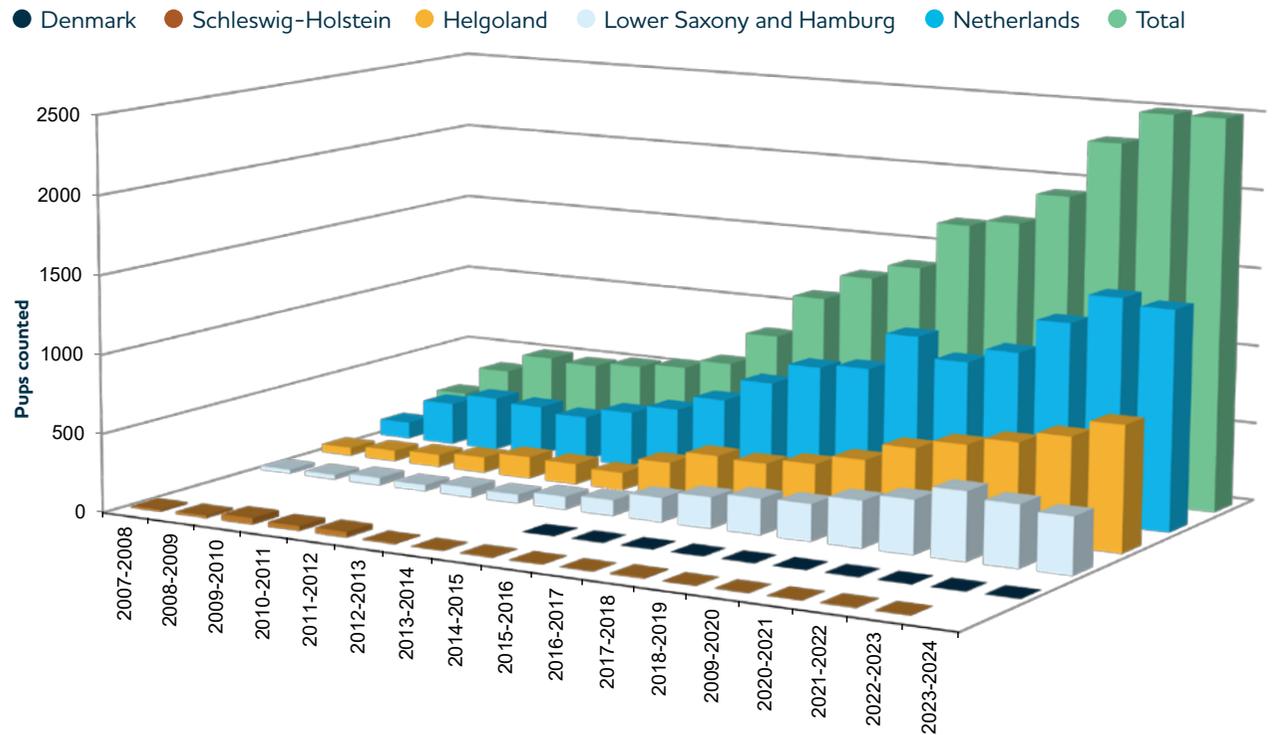
RESULTS AND INTERPRETATION

PUP COUNTS

During the pupping season, coordinated counts across the Wadden Sea and Helgoland resulted in a total count of 2,493 pups (see Figure 1). Pup numbers have been stable compared to the 2022/2023 season (Schop *et al.*, 2023).

Most of the pups were counted in the Dutch Wadden Sea, comprising 54.8% of the total count, followed by Helgoland (31.1%) and Lower Saxony (14.1%). Within the Dutch Wadden Sea, the count of 1,395 pups represented a 3% decrease compared to the previous breeding season. In Lower Saxony, there was a 9% decrease compared to the last season, resulting in 359 pups. However, adverse weather conditions did not allow surveys to be conducted on the expected peak dates in this area, likely resulting in lower numbers. The number of pups on Helgoland increased by 16% to 739. In Schleswig-Holstein and Denmark, no grey seal pups were recorded during the coordinated survey period. Later in the breeding season, four nursing pups were observed in Denmark and two in the Wadden Sea area of Schleswig-Holstein.

Number of grey seal pups counted in the Wadden Sea during breeding season between 2007-2008 and 2023-2024
Colours indicate results of the regional counts.



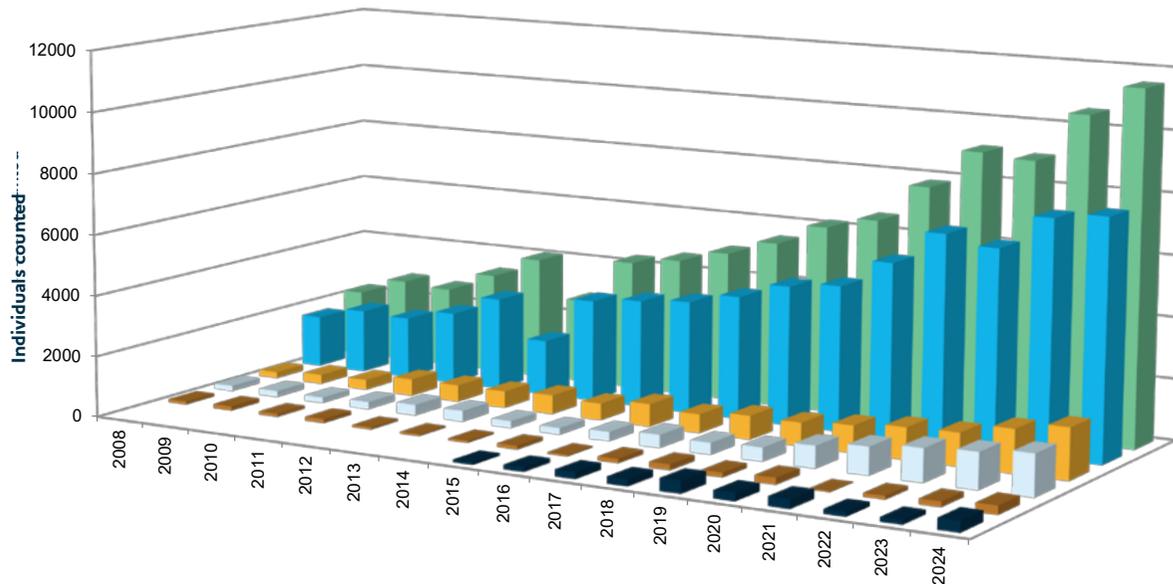
RESULTS AND INTERPRETATION

MOULT SURVEYS

Number of grey seals counted in the Wadden Sea regions during peak moult (March-April) between 2008 and 2024

Colours indicate results of the regional counts.

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



During the moult, a peak in numbers of grey seals hauled out is typically observed. The moult is characterised by seals with visible changes in fur colour. In the Wadden Sea, this occurs between March and April (Schop *et al.*, 2017). In 2024, a total of 11,515 grey seals were counted during the moulting season in the Wadden Sea; a 9% increase compared to 2023 (Schop *et al.*, 2023; see left-hand figure).

Approximately 67% of the grey seals counted during the moult were observed in the Dutch Wadden Sea, where 7,821 grey seals were counted. This percentage seems to be dropping slowly as the areas to the east become more important. Lower Saxony and Hamburg contributed 12% to the total count with 1,364 animals, while 14% (1,683 animals) were recorded on Helgoland. This year, the number of grey seals counted in Schleswig-Holstein increased by 63% to 286 seals. Numbers of moulting grey seals in the Danish Wadden Sea more than doubled: 361 compared to 145 last

year. The numbers observed in these areas represent 2% and 3% of the total counts, respectively.

During the moult, grey seals tend to concentrate in large numbers on the highest sandbanks. Conditions at those sites, like disturbance, are likely to have a big impact on the counts which could cause significant variation. Potentially variation in peak numbers could also be influenced by migration from other colonies. The effect is expected to be stronger in areas with few pups, thus areas that are more dependant of seals moving in and out (i.e. the eastern Wadden Sea area). In previous years, the count results seemed to indicate that the timing of the moulting peaks differ slightly between regions, while this year the peak in counts occurred in the same period throughout the Wadden Sea. To understand the causes of fluctuations in the different counts and provide insight into the processes driving the changes in the populations and potential regional variation, more counts are needed.

GREY SEAL SURVEYS

CONCLUSION

Compared to the 2022-2023 period, both the counts of grey seal pups and the count of moulting grey seals in the Wadden Sea were higher in 2023-2024. A total of 2,493 pups and 11,515 moulting grey seals were counted. The pup production has shown an average annual growth rate of 9% over the past five years, while the numbers of grey seals counted during the moult have increased at an annual rate of 12% during the same period.

Though number of grey seals in the eastern part of the Wadden Sea are relatively low, there appears to be a spatial variation in the timing of the peak in pup counts. The few pups in the eastern part of the Wadden Sea are observed later than the peak seen in the western part. When the recolonisation started in the 1980s, the pupping peak in the Dutch Wadden Sea occurred in early January. This has now shifted to early December (Brasseur *et al.*, 2015). This could indicate a maturing population, with more older females. A similar finding was made by a study in the UK though that suggests that climate change could modify the age structure of the grey seals shifting their phenology (Bull *et al.*, 2021).

Later births are also described in Kattegat, where the Atlantic grey seal occur alongside the Baltic subspecies (Galatius *et al.*, 2024). To gain a better understanding of the peak in grey seal numbers during both breeding and moulting, it is imperative to enhance our understanding of day-to-day and annual variations, potential phenological disparities within the Wadden Sea, the impact of movements both within the Wadden Sea, and between the Wadden Sea and the wider North Sea, and potentially the Kattegat.

Here we present relative changes in abundance. Obtaining absolute estimates of number of grey seals using the Wadden Sea would require assessing the proportion of seals in the water during the surveys and estimating the rates of exchange with other areas as well. Information on other population parameters such as mortality and fecundity rates would help designing an effective conservation and management plan for grey seals of the Wadden Sea region.



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