

## Distribution

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# Numbers and Distribution of Eider Ducks *Somateria mollissima* in the German Wadden Sea in Winter 1999/2000: Fleeing the Fate of Death?

## Introduction

During the winter of 1999/2000, Eider Ducks experienced a higher mortality than usual in most parts of the Wadden Sea (Camphuysen 2001, Fleet 2001). However, this mortality was not distributed equally along the shore. On the southern shores of the Wadden Sea (The Netherlands, East-Friesland) at least, a west-east gradient in the numbers found dead could be detected, with most of the dead birds found in the western parts. Here, we look for the long-term development of Eider numbers in winter in the German Wadden Sea and possible changes in the distribution of Eiders in relation to the 1999/2000 mortality.

## Numbers of Wintering Eider Ducks in the German Wadden Sea

Since the first complete aerial counts in 1987, the total number of wintering Eider ducks in the German Wadden Sea has fluctuated strongly between 70,203 and 174,092 birds. Over the entire time interval, no trend in Eider numbers could be detected (Fig. 1;  $r_s = 0.137$ ,  $p > 0.05$ ). The sub areas of Lower Saxony and Schleswig-Holstein also show apparently large fluctuations but no definite long-term trends (for Lower Saxony:  $r_s = -0.077$ ,  $p > 0.05$ ; for Schleswig-Holstein:  $r_s = 0.235$ ,  $p > 0.05$ ). Shifts

between the two sub areas from one year to the next seem to be quite common, however, both data series are not correlated with each other ( $r_s = -0.401$ ,  $p > 0.05$ ).

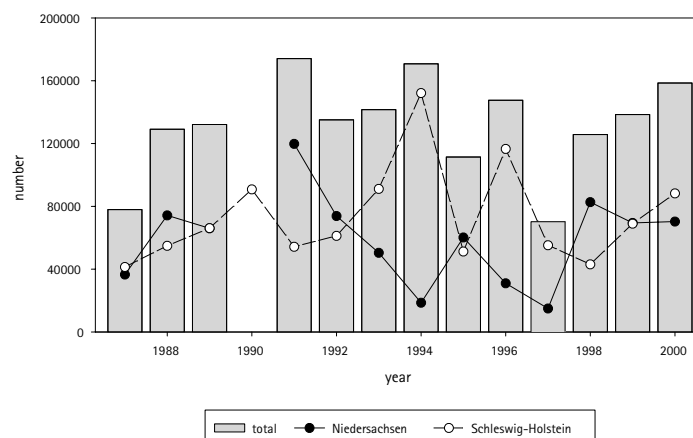
Despite the elevated mortality in the winter of 1999/2000, total January numbers of Eider Ducks in 2000 did not seem to be influenced by this event, as numbers remained stable in Lower Saxony and even increased in Schleswig-Holstein. Most probably, counts from the 2000/2001 season will show whether the total wintering population was affected by the 1999/2000 mortality episode. The number of molting Eiders in the Schleswig-Holstein Wadden Sea did, however, drop dramatically in 2000. Furthermore, because shifts in distribution of Eiders between areas take place, an analysis of long-term changes of Eider numbers for the entire Wadden Sea has to be carried out.

## Shifts in Distribution between Winters

In the winters before 1999/2000, most of the Eiders using the East-Frisian Wadden Sea were concentrated in the western parts (Borkum-Norderney, Fig. 2). However, this is also the area where the highest mortality in Lower Saxony occurred between 1999/2000. In contrast to previous years, in the latter winter Eiders were concentrated on the tidal flats in the eastern parts of the area, namely the back barrier systems of Wangerooge and Minsener Oog. At these locations, 41 % of all Eiders wintering in Lower Saxony and 51 % of the birds present in the East-Frisian part could be found.

The shift in distribution patterns is probably due to a change in food availability. The staple food for Eider ducks is mussels (*Mytilus edulis*) and cockles (*Cerastoderma edule*, Nehls 1995). As the analysis of a small sample of feces indicated, birds near Juist were

Figure 1: Numbers of wintering Eider ducks (*Somateria mollissima*) in the German Wadden Sea, obtained by aerial counts during low tide. Counts were conducted in January or February. Data for Schleswig-Holstein comes from the Landesamt für den Nationalpark Schleswig-Holsteinisches Wattenmeer.



feeding on mussels and shore crabs (*Carcinus maenas*), whereas birds in the eastern parts near Minsener Oog, were almost exclusively feeding on cockles (Tab. 1). The occurrence of shore crabs in the diet of the Eiders wintering in the western part of the East-Frisian Wadden Sea might indicate a shortage of suitable mussels and cockles in this area. These findings also stress the fact that birds wintering in the Wadden Sea cannot rely on one single prey species but need to be able to exploit alternative prey (Zwarts et al. 1996). Besides the presence of sufficient numbers, the quality of prey must also be high enough so that Eiders can gain enough energy from their food. Unfortunately, it is still uncertain, which part of mussels and cockles provides the Eider Ducks with the most energy. Furthermore, for most of the Wadden Sea, virtually nothing is known about the distribution and condition of cockles, so that an assessment of the harvestable amount of prey for Eider Ducks is not possible at the moment.

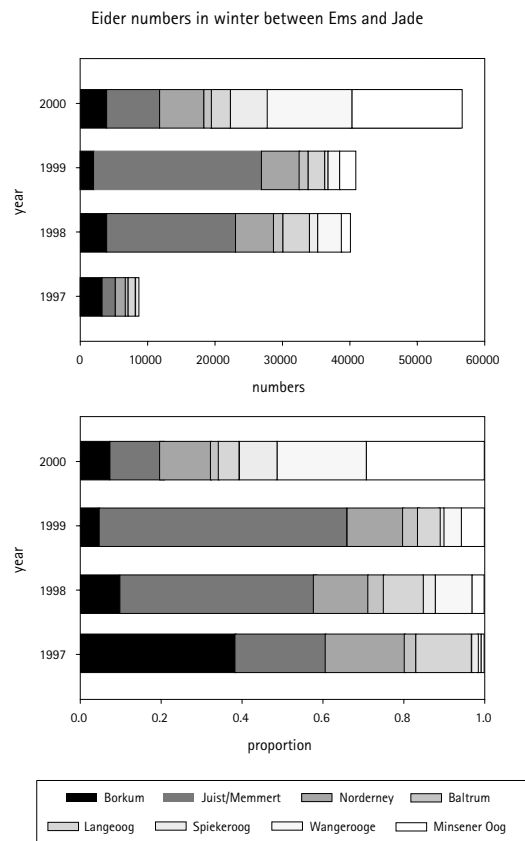


Figure 2: Distribution of Eider ducks (*Somateria mollissima*) in the East-Frisian Wadden Sea since 1997. Numbers of Eiders were aggregated according to the different backbarrier intertidal areas of the East-Frisian islands. Areas are arranged from west to east.

Table 1: Composition of feces from Eider Ducks collected on 22.01.2000. Fecal pellets were counted in the field at roosting sites. Percentage of pellets containing a certain prey type are given in the table; category „mixed“ includes pellets with more than one prey species. Please note that samples were taken only on one day and that Eiders visiting these roosts are not representative of all Eiders present in the area.

Roosting site	<i>Mytilus edulis</i>	<i>Cerastoderma edule</i>	<i>Macoma balthica</i>	<i>Carcinus maenas</i>	mixed	n
Juist	62.6	3.8	0.5	33.1		393
Minsener Oog		99			1	100

## References

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