

Distribution

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Numbers and Distribution of Wintering Common Eiders in the Dutch Wadden Sea in 2000

Introduction

Common Eiders *Somateria mollissima* are among the most common winter visitors to the Dutch Wadden Sea. Numbers recorded during aerial surveys by the National Institute for Coastal and Marine Management/RIKZ, in December-February 1994-2000, fluctuated between 98,000-128,000 individuals in normal winters and up to 163,000 in severe winters (Baptist et al., 1997; Berrevoets et al., 2000). About 20% of these birds are expected to have originated from the local breeding population, which has strongholds on the islands Vlieland, Terschelling, Schiermonnikoog and Rottumeroog/Rottumerplaat. In 1996, the breeding population in the Dutch part of the Wadden Sea was estimated at 10,000 pairs, which is 84% of the overall breeding population in the international Wadden Sea (Rasmussen et al., 2000). Besides local breeders, birds from the large Baltic population also arrive from July onwards, first to moult and later to make up part of the winter population. On average, about 5-6 % of the flyway population stays in the Dutch section of the Wadden Sea throughout the winter, but this

figure may vary due to ice-conditions within the wintering range.

In 1999/2000, an obvious mass mortality occurred among wintering eiders. More than 7,000 birds were collected during Beached Bird Surveys, the total number of casualties clearly being much higher (Camphuysen, 2000). This contribution summarizes an analysis on changes in numbers, distribution and habitat use of eiders in the Dutch Wadden Sea in 1999/2000. This study was carried out as part of a large project organized by the Netherlands' Ministry of Agriculture, Nature Management and Fisheries, which aimed at assessing the background of the observed mass mortality (Van den Berk et al., 2000). The data used in the analysis were derived from the annual aerial surveys of the Dutch Wadden Sea and the coastal zone north off the Wadden Sea Islands (Fig. 1), carried out by RIKZ as part of a marine monitoring program (see Berrevoets et al., 2000 for details on methods).

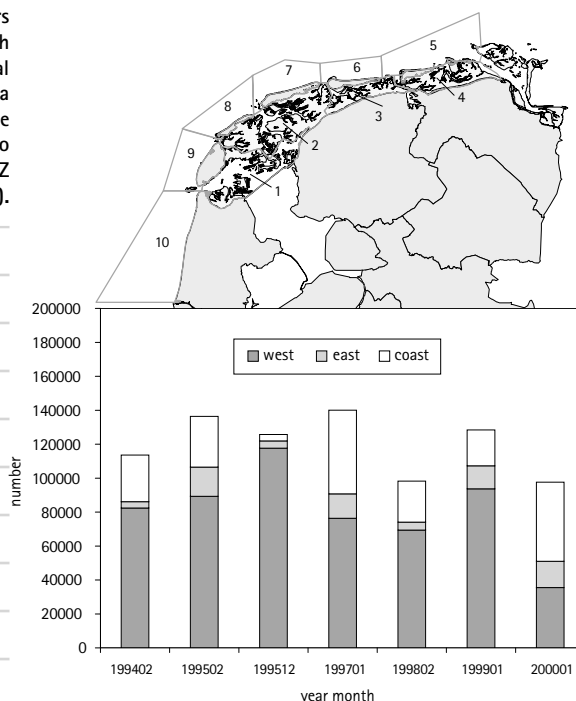
Trends in Wintering Populations

The numbers recorded during the aerial surveys between 1994-2000 fluctuated without showing a clear trend (Fig. 1). Previous counts by Swennen in the 1980s (review in Baptist et al., 1997) showed similar results, indicating stable numbers over the last 20 years. Higher numbers were counted during severe winters like 1996 and 1997 when up to 163,000 eiders were present. The figures for 1999/2000 (98,000) were about 20% below the long-term average for 1994-99 (excluding severe winters), and similar to the results in 1998.

Distribution and Habitat Use

The Dutch wintering population of eiders has its core area in the western part of the Wadden Sea, especially in the area west of Ameland-Harlingen (sections I and II, Fig. 1). In 1994-99, these sections held on average 67% of all birds. In January 2000, almost 50% of all individuals were observed in the North Sea, just offshore the Wadden Sea Islands

Figure 1: Numbers of eiders recorded in the Dutch Wadden Sea and coastal zone off the Wadden Sea Islands. Inset shows the survey area, divided into sections I-X. Data: RIKZ (Berrevoets et al., 2000).



(Fig. 1), but this was obviously a result of scaring and disturbance activities in the area south of Vlieland and Terschelling. Moreover, numbers in the eastern part of the Dutch Wadden Sea were higher than in previous years, although in direct comparison to the westernmost sections, they still remain low when absolute numbers are considered.

In order to detect changes in habitat use, the results of eight aerial surveys between December and February 1994–2000 were analyzed using a Geographical Information System, which also contained details on habitat characteristics. These surveys include an extra census in February 2000, carried out in cooperation with Alterra on Texel. In total, 32 out of 2000 flocks (1% of all birds) lacked accurate site location and were omitted in the analyses. The distance to the nearest mussel bed was calculated for the remaining flocks. Moreover, observations were assigned to a 200x200 m grid and categorized in areas with mussel beds (all flocks within 1000 m of a mussel bed), mudflats without mussel beds and open water (see Berrevoets et al., 2000 for details on methods).

In 1994–99, the highest densities of eiders were recorded close to mussel beds (on average 75 birds/km²). Densities on mudflats and open water were comparable, but about 60% lower in comparison to mussel beds. Both categories held on average 30 birds/km² (Fig. 2). An aberrant pattern only occurred in January 1997, when extensive ice-sheets forced eiders to redistribute themselves over areas with open water. In 2000, a marked decline in numbers was recorded on mussel beds. Densities decreased by 70%, i.e. remarkably similar to those on mudflats and open water. For the latter two categories, densities remained stable over 1994–2000, except for January 1997 (see above). The increase in numbers in the eastern part of the Dutch Wadden Sea mentioned earlier, especially occurred on mudflats. In the area south of Ameland, densities on mudflats increased from 10 birds/km² in 1994 to 30/km² in 2000.

Decline in Use of Mussel Beds

Mussel beds are confined to the western part of the Dutch Wadden Sea, i.e. west of Ameland–Haringen (section I and II, Fig. 1), thus within the core area of the wintering eiders. However, their size is small and they comprise of less than 10% of the overall area of both sections. Nevertheless, on average 60% of the eider population in these sections can be found on these mussel beds during

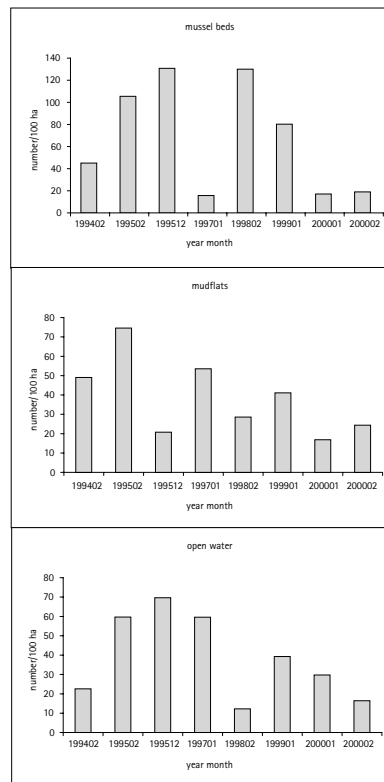


Figure 2: Densities of eiders for mussel beds, mudflats and open water for the entire Dutch Wadden Sea. The horizontal line indicates the average density over 1994–1999 (excluding severe winter of 1997).

midwinter (data 1994–99, excluding 1997). The numbers observed on mussel beds in section I in January/February 2000 were 60–70% lower than in previous years. Densities decreased from more than 60 birds/km² to less than 20/km² (Fig. 3). These values are even lower than those found on open

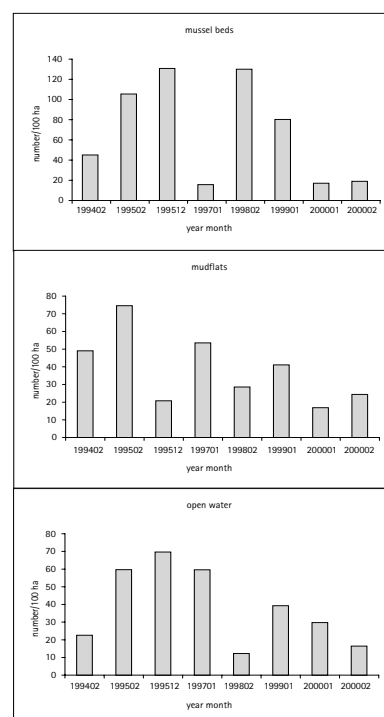


Figure 3: Densities of eiders for mussel beds, mudflats and open water for the westernmost part of the Dutch Wadden Sea (section I, Fig. 1). The horizontal line indicates the average density over 1994–1999 (excluding severe winter of 1997).

water, which normally had much lower densities than mussel beds. Mudflats also tended to have lower densities when data for 1994–97 and 1998–2000 were compared, but on open water, the densities fluctuated without a clear trend. Section II shows a less clear picture. The birds in this section can frequently move to neighboring sections (due to disturbance), especially the North Sea off Vlieland/Terschelling (section VII/VIII in Fig. 1), which makes it difficult to detect changes linked to habitat use and food stocks.

Conclusions

Over the past two decades, the wintering population of eiders in the Dutch Wadden Sea has shown stable numbers. Between 1994–99 (excluding 1997), on average 120,000 eiders were observed. The number recorded in January 2000 was 20% below this average, and together with the census in January 1998 the lowest so far. The data from the two censuses in 2000 show a clear shift in the distribution of wintering eiders. The densities around mussel beds, previously being 60% higher than those on mudflats and open water, dropped by 70%, equaling the overall distribution over these three habitats. This pattern was found for both the Dutch Wadden Sea as a whole, as well as for the separate sections within the Wadden Sea. The most distinct shifts occurred in the westernmost part of the Dutch Wadden Sea, where mussel beds were nearly abandoned. Moreover, there was a tendency towards an eastward expansion of the wintering areas, probably as a result of the decrease in the western part of the Wadden Sea. Since Common Cockle *Cerastoderma edule* densities have also increased recently here, it seems feasible that this resource has attracted many eiders to this area.

Marked shifts in the distribution of eiders have been recorded before. From 1990 onwards, there was a significant increase in the number of eiders on the North Sea, mainly off Vlieland and Terschelling. Numbers here peaked in January 1993, when more than 50% of the wintering population was seen in this area (Baptist et al., 1997). These movements have been attributed to depletion of the eiders' food, Blue Mussels *Mytilus edulis* and cockles. As a result, birds started to feed on Cut-through -Shells *Spisula subtruncata*, which occur in the coastal zone off the Wadden Sea Islands. Prior to this shift (1990/91 and 1992/93), mortality among the wintering birds increased threefold (Camphuysen, 1995). After 1993, the wintering population quickly recovered, and also moved back to the regular wintering sites within the

Wadden Sea after food stocks had improved. Nowadays, about 20,000 eiders still winter regularly in the coastal zone of the North Sea.

It remains unknown what impact the wreck in 1999/2000 will have on the population in the long term. Continued surveys in 2000/2001 will give the first signals whether the population has recovered and whether or not the low number in January 2000 was the prelude to a population decrease. Moreover, in the 2001 breeding season, the third total breeding bird survey under the flag of the Joint Monitoring Group of Breeding Birds in the Wadden Sea (JMBS) has been scheduled, which could give more evidence on the possible impact on the local breeding population.

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