

Net dispersal of harbour seals within the Wadden Sea before and after the 1988 epizootic

- [Edith H. Ries^a](#), [Ilona M. Traut^b](#), [Albertus G. Brinkman^a](#), [Peter J.H. Reijnders^a](#)
- ^a DLO-Institute for Forestry and Nature Research, P.O. Box 167, 1790 AD Den Burg, Texel, Netherlands
- ^b University of Oldenburg, P.O. Box 2593, 26111 Oldenburg, Germany

Abstract

Harbour seals in the Wadden Sea (The Netherlands, Germany and Denmark) have been monitored by aerial surveys since the 1980s. Annual maximum figures reported in the various regions (38 separate tidal basins) and the number of pups counted were used to estimate vital population parameters and to quantify the net migration of harbour seals within the Wadden Sea before (1980–1987) and after an epizootic (1990–1994). The total pre-whelping population increased at a mean annual rate of 9 and 14%, respectively, and varied considerably among the various regions of the Wadden Sea. The overall mean annual survival was found to increase from 0.88 during the pre-epizootic period to 0.93 during the post-epizootic period. The distribution of pups and of older seals over the 38 separate sub-areas was highly uneven. Based on between-year population changes and the number of pups reported, net dispersal fluxes among the four regions of the Wadden Sea were estimated for the two time intervals. During the pre-epizootic period, only Schleswig-Holstein, Germany, produced a surplus of animals which counter-balanced the low recruitment of the other regions. During the post-epizootic period, the net dispersal fluxes were at a much lower level. Nevertheless, in The Netherlands, a continuous influx of seals was required because the recruitment was insufficient to explain the observed numerical increase. At the level of the 38 separate tidal basins, the actual pattern of dispersal showed that the majority of sub-areas were not self-supporting with respect to the local pup production and thus dependent on the influx of animals. More than 65% of all immigrants originated from only 7 sub-areas, which are considered 'key areas' of vital importance for the Wadden Sea harbour seal population.

Keywords

harbour seals; abundance, distribution; Wadden Sea; survival; dispersal; key areas