

Reproductive rate of Baltic grey seal (*Halichoerus grypus*) females has fluctuated during the 2000s, although reproductive disturbances, which occurred a few decades earlier, are rare at present. **We studied possible effects of environmental factors (food quality and winter temperature) on the annual variation in birth rate of seals.**

Body condition (subcutaneous blubber thickness) of adult females affected their birth rate. Body condition of seals, in turn, correlated positively with herring (*Clupea harengus*) and sprat (*Sprattus sprattus*) quality (average weight). Fish quality was influenced by density dependent intra- and interspecific competition for zooplankton. Also cod (*Gadus morhua*) abundance, as well as zooplankton biomass and plankter size affected herring and sprat quality. This suggests **strong trophic coupling over three trophic levels.**

Climate warming has a negative effect on zooplankton due to increased water temperature and decreased salinity. Body condition of seal pups is also affected by winter temperature: in warm winters with poor ice conditions pups are in poor condition. Body condition of pups has also delayed effects on their lives as adults. Females have a higher birth rate and males are bigger as adults when born in cold winters than those born in warm winters.

We thus conclude that the birth rate of grey seals can be used as an indicator of the status of the Baltic Sea environment.

