

## Seabird displacement at offshore wind farms: Effect versus impact

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The huge marine surface area assigned to current and future offshore wind farm developments has raised concern over the impact of displacement and resultant habitat loss on seabird populations. Since 2005, the Research Institute for Nature and Forest (INBO) performs monthly BACI designed surveys to study seabird displacement at two offshore wind farms in the Belgian part of the North Sea. For a number of species, good correspondence was found in the observed displacement effects between sites. Common guillemot significantly decreased in densities by 69% and 75% at the Thorntonbank and Bligh Bank respectively, while northern gannet numbers dropped by 97% and 82%. On the other hand, both sites attracted great black-backed and herring gulls, the former for example having increased in numbers by a factor 6.6 at the Thornton Bank. Unfortunately, the ecological consequences of the observed changes in seabird distribution following offshore wind farm construction remain poorly understood. Birds subject to displacement can be expected to fly around the wind farm and/or spend time searching for alternative foraging habitat, implying an increased energetic cost. When the alternative habitat proves to be of minor quality or displaced birds face increased competition, this may further lead to a decreased food intake rate, potentially leading to increased mortality and/or decreased productivity. Otherwise, birds attracted to wind farms are likely to be subject to increased collision risk and additional mortality. A quantitative translation of these effects into a population impact, however, is extremely difficult. Empirical knowledge on key aspects of seabird ecology such as density-dependant mechanisms and demographics is often lacking, yet urgently needed to support a reliable assessment of the actual ecological consequences and cumulative impact of extensive offshore wind farm installation on seabirds.

Keywords: seabird displacement; offshore wind farms; BACI monitoring; ecological consequences