

Large gull behavior inside an offshore wind farm

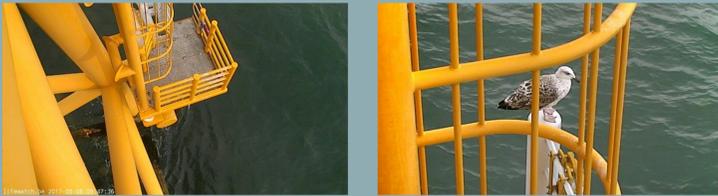
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Material & Methods

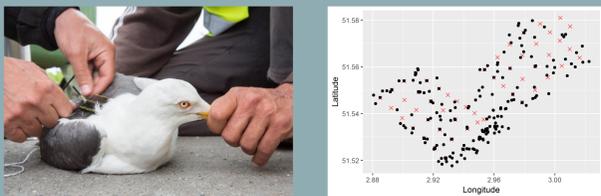
- Study area: the Thorntonbank offshore wind farm (OWF) located 25 km off the Belgian coast. This OWF comprises 54 turbines, 6 of which are installed on gravity-based foundations and 48 on jacket foundations, the latter offering particularly numerous roosting possibilities for gulls.
- Counts of birds associated with turbine foundations during ship-based transect monitoring:



- Counts of large gulls through a fixed camera:



- Analysis of GPS tracks of lesser black-backed gulls:



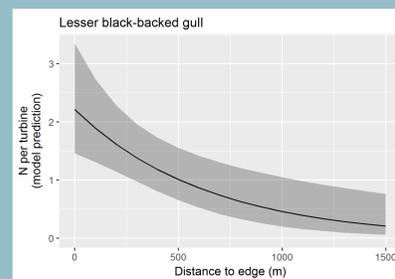
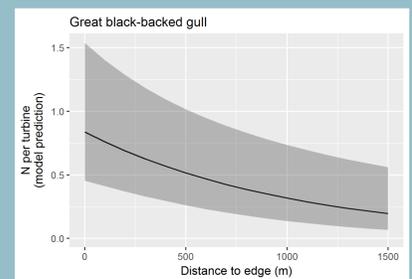
Results (1)

- An estimated mean of 0.98 (fixed camera) and 1.21 (transect counts) large gulls were observed to be associated with the jacket foundations in the Thorntonbank OWF.
- 83% of the gulls associated with turbine foundations observed during transect counts were great black-backed gulls, with only 13% and 4% lesser black-backed and herring gulls respectively. In contrast, but accounting for one turbine (15) only, the proportion of herring gull amounted to 34% as observed with the fixed camera. Meanwhile, lesser black-backed gull was by far the most common of the three large gull species in surrounding waters.
- 11% of the large gulls observed with the fixed camera were foraging on mussels growing the lower intertidal reaches of the jacket foundations, most of these being herring gulls.



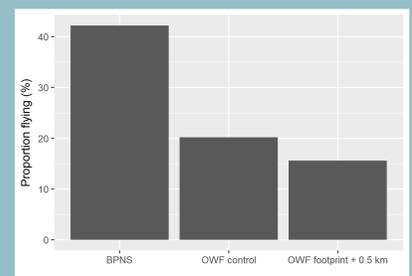
Results (2)

Transect count data showed that **great black-backed gulls** associated with jacket foundations preferred outer turbines over inner turbines, illustrated by a significant effect of distance to the OWF edge on the numbers counted ($P < 0.001$).



GPS tracking data showed that **lesser black-backed gulls** entering the Thorntonbank OWF spent 51% of their time roosting on jacket foundations, and that distance to the OWF edge had a significant effect on the number of different individuals visiting the turbines ($P = 0.004$).

GPS tracking data further showed that **lesser black-backed gulls** spent less time flying inside the OWF impact area compared to the control area. In turn, flying activity in the OWF study area (control + impact area) was much lower compared to the BPNS as a whole.



Conclusions

- The observed preference of both lesser and great black-backed gull to outer turbines suggests a **partial barrier effect**, despite earlier reported attraction effects towards Belgian offshore wind farms. Turbine foundations were mainly used for roosting, but occasionally, great black-backed and herring gulls were observed foraging on mussels growing on the lower reaches of the jacket foundations during low tide.
- The gulls' preference to outer turbines combined with the inconsistent and occasional foraging on a yet daily available and easily accessible food source is in strong support of the stepping stone hypothesis: gulls seem to use the OWF as an **'offshore outpost'** rather than a favoured foraging area.
- The results of this study may shed new light on the currently expected collision risk of large gulls at OWFs, and highlight the need for **post-construction monitoring**. Impact assessments tend to extrapolate pre-construction numbers and behavior to feed collision risk models. But next to a possible post-construction change in numbers, any behavioral shift – a change in time flying or a non-homogenous distribution due to attraction to the turbines and/or wind farm edges – may have a strong effect on the anticipated collision mortality.