

Third party investigations

According to the ZSL Institute of Zoology's UK Cetacean Strandings Investigation Programme (CSIP), cetaceans (whales, dolphins and porpoises) have regularly stranded around the UK. Since the inception of the CSIP in 1990, data on over 12,000 stranded cetaceans have been recorded in the UK and nearly 3,500 necropsies have been carried out, producing one of the world's largest research datasets on strandings and causes of mortality.

<https://www.zsl.org/science/research/uk-cetacean-strandings-investigation-programme-csip>

Independent investigations into recent strandings along the Norfolk coast, predominantly of harbour porpoise, and of sperm whales in early 2016, have demonstrated the cause of these strandings:

1. **Harbour porpoise:** the most common reason for stranding is due to by-catch, infectious disease, starvation and grey seal predation.
2. **Sperm whales:** strandings are believed to be caused by animals accidentally swimming into the Southern North Sea waters, where they get disoriented due to the shallow waters. They were also found to have high amounts of ocean plastics within their stomachs. This large number of stranding events also occurred in 1994 with 25 stranded sperm whales and in 1996 with 27 and is not a one-off incident.



Interested in scientific research and offshore wind farms?

Read about our €3mn fund dedicated to researching the environmental impact of offshore wind, hosted at the European Offshore Wind Deployment Centre. Projects shortlisted for funding span topics covering the distribution and movement of different bird, mammal and fish species, to looking at the effect of offshore wind on the environment and societies, to marine geology. More information about the EOWDC scientific research and monitoring programme and scientific panel is available at <https://corporate.vattenfall.co.uk/eowdc>

To contribute your views, register your interest and keep up to date with the Norfolk projects, use one of these means:



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Norfolk Vanguard & Norfolk Boreas Information Sheet:

Marine Mammals



Marine Mammal Impacts

This leaflet explains how we plan to approach our work to assess and minimise the impacts of Norfolk Vanguard on marine mammals.

What we plan to assess

The sensitivity of the marine environment is a key consideration for the Norfolk Vanguard and Norfolk Boreas projects. This is particularly important given the proposals to designate much of the southern North Sea as a Special Area of Conservation for harbour porpoise. Vattenfall plan to undertake thorough assessments of the likelihood of any potential impacts on marine mammals and the results of the assessments will be presented within the Preliminary Environmental Information Report (PEIR).

The initial stage of impact assessment is to estimate the occurrence of marine mammal species within the area. Subsequently, we will outline the known potential impacts of offshore wind farms and assess the likelihood of these to occur from both projects.

Data sources for our assessment

Vattenfall are using the most up to date information available, as well as collecting new site specific data to investigate the presence of marine mammals. We are currently gathering high resolution aerial imagery over the wind farm sites. This enables us to assess the number of marine mammals that could be using the site and to review the main species present.

The results so far show that harbour porpoise are the most commonly sighted mammal within and around the project areas. Dolphins have been recorded, but less

frequently, and one seal was seen during the first eight months of surveys.



Minimising potential impact

Vattenfall are working closely with a number of industry-leading marine mammal experts who have a vast experience and knowledge of the effects of offshore wind farms. Vattenfall will collaborate with these experts to develop mitigation measures to ensure no detrimental impacts to these animals.

Potential impacts

1. **Underwater Noise:** We are undertaking underwater noise modelling as part of the impact assessment. This will show us the noise ranges expected during construction, the levels at which this could cause harm or disturbance to various marine mammal species, and allow us to develop suitable mitigation.
2. **Barrier effect:** The impacts of underwater noise described above could result in a barrier effect for cetaceans transiting north/south in the North Sea or seals moving between feeding grounds and haul-out sites. Vattenfall will review the underwater noise modelling information and an expert judgement will be made to determine the likelihood of any impact.
3. **Changes to prey resource:** Construction activities may displace sensitive fish species which are food for marine mammals. Vattenfall are undertaking a detailed Fish and Shellfish Ecology Assessment which will consider the dependence of each marine mammal species on these prey species.

4. **Vessel interaction:** Ship strikes are known to occur, despite the potential for marine mammals to detect and avoid vessels. We will review the current use of the offshore area and activity of vessels and will also undertake a detailed Navigational Risk Assessment.
5. **Disturbance at seal haul out sites:** Increased activity near seal haul out sites as a result of transiting vessels could have the potential to disturb seals. The occurrence of vessels in the area will provide the basis of this assessment.

Potential cumulative impacts

Any other project with the potential to result in impacts that may act cumulatively with Norfolk Vanguard will be identified during consultation and following a review of available information. These projects will be included in the Cumulative Impact Assessment in the PEIR.

Supporting Research & Development

Vattenfall funds research and development programmes aiming to increase environmental protection at onshore and offshore wind farms.

One such programme is DEPONS, an international research project initiated and funded by a group of five offshore wind farm developers and led by Vattenfall. The aim of DEPONS is to improve knowledge of the impacts of piling noise on the southern North Sea harbour porpoise population. Data on movement patterns, and information on harbour porpoise densities at different distances from a wind farm under construction, are being fed into a simulation model. Results will be documented in a scientific paper planned for later in 2017. For the latest research and results, see <http://depons.au.dk>

Studies at a range of offshore wind farms in the southern North Sea have shown that harbour porpoise move away during construction but return shortly after piling has been completed.