



THE PLANNING ACT 2008

THE INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE) RULES

2010

**Natural England's response to G5.6 Indirect Effects of Forage Fish and Ornithology –  
Revision 1 [REP5-085]**

For:

The construction and operation of Hornsea Project Four Offshore Wind Farm, located approximately 69 km from the East Riding of Yorkshire in the Southern North Sea, covering an area of approximately 468 km<sup>2</sup>.

Planning Inspectorate Reference EN010098

27<sup>th</sup> July 2022

Natural England welcomes the provision of this report by the Applicant further investigating interactions between Hornsea Four and the Flamborough Front and subsequent impacts on forage fish and seabirds. Overall, Natural England maintains that the region is of high environmental value, however the limitations of the available data restrict conclusions to a wide, regional scale, disallowing confidence in conclusions made on a smaller, localised scale.

### **Forage fish**

Data on forage fish within the Hornsea Four array area and along the Flamborough Front is limited and at a coarse scale. Natural England do not believe the conclusions presented within this paper are supported by sufficient evidence for them to be considered within Examination with any degree of certainty. This is principally due to:

- i) the limited data available on the fish diversity and abundance found within the area and,
- ii) absence of detailed or site-specific evidence on the importance of the Front to forage fish productivity.

Natural England highlight that fish populations are not typically used as indicators of local productivity due to the complexity of fish population processes. For example, seemingly straightforward exercises such as species population estimates (i.e. fisheries stock assessments) have been subject to intense scrutiny and scientific debate for decades, culminating in the creation of a dedicated intergovernmental scientific body (ICES).

Paragraph 8.2.1.1 of the report acknowledges the limitations of the fish and shellfish assemblages both seasonally and annually. For example, using Vessel Monitoring System (VMS) data as a proxy for fish presence is problematic, as the underlying assumption that fishing effort mirrors fish presence is affected by numerous confounding factors complicating the relationship. While it is a useful indicator in the absence of other data, any conclusions drawn are of low confidence.

Reflecting the overall paucity of fish data available, the report focusses on three species of fish which are both commercially targeted and are key prey items for Flamborough and Filey Coast Special Protection Area (FFC SPA) seabirds. NE advises that these species are strongly suspected to have nursery grounds (and in the case of sandeel, residential habitats) in this general region of the North Sea (5.1.1.2). NE agrees with the numerous limitations presented on the use of Ellis et al. (2010, 2012) and Coull et al. (1998).

In summary, Natural England maintain our position that Flamborough Front is a large-scale feature of high environmental importance. We agree that there is limited direct evidence on how important the Flamborough Front is for forage fish, and how it drives the distribution and abundance of forage fish at a more detailed scale. Therefore, the distinctions made by the Applicant of the relative importance of the Hornsea 4 array area compared to other locations in the vicinity of the Front should be given limited credence.

The report has not considered any cumulative impact of multiple large scale wind farms all being built within the region of the Flamborough Front and any combined effects on stratification / seawater mixing, and therefore pelagic productivity and forage fish availability. This is particularly relevant to the Flamborough Front due to the Hornsea zone overlapping and lying adjacent to it. Emerging evidence suggests that OWFs could have large-scale effects on stratification processes within shelf seas, including in the southern North Sea (Dorrell et al. 2022, Christiansen et al. 2022). Potential changes could influence primary productivity and ecosystem functioning through several complex pathways. Christiansen et al. (2022) note that

such processes could affect the stratification development in the southern North Sea and this may impact marine ecosystem processes.

As part of the ongoing discussions on the Flamborough Front as a receptor to marine processes, Natural England have recommended a monitoring strategy that, if agreed by the Applicant, will go some way to answer uncertainties around the impact of one large scale windfarm on stratification and mixing and if any impact can be seen beyond the boundary of the array (see E42 of our Risk and Issues Log for further details).

### **Ornithology**

Please see our Deadline 6 submission B6.1 for further discussion on the evidence provided in this report in relation to impacts on auks.

REP5-085 concludes that there may be some correlation between the location of Flamborough Front, forage fish abundance, fishing activity and the presence of seabird aggregations exploiting the resources within the area around Hornsea Four. Natural England agrees that this is likely to be the case. However, the Applicant suggests that by excluding the areas of apparent highest importance for auks to the north and south, the post-developable area approach (DAA) project envelope (including gravity bases) is unlikely to result in any significant impact on the Flamborough Front and distribution of prey.

We do not consider this conclusion can be drawn with much confidence. The Applicant usefully highlights that there is a high degree of interannual variability in the timing, position and extent of the Front. Accordingly, it seems likely that there is interannual variability in the distribution and abundance of forage fish and therefore of the seabirds that feed on them. The link made between water depth and the formation of the Front is entirely plausible, however as with other factors, this is likely to operate at a broad scale. Given the water depth across the Hornsea 4 array area is still fairly shallow compared to the deeper water to the north, again we advise that drawing detailed spatial conclusions is not really justified.

As set out in E45 of Natural England's Risk and Issue log (Marine Process tab), Natural England do not believe the Applicant has provided sufficient evidence to rule out the potential for changes to oceanographic processes that govern the occurrence of the Flamborough Front and more localised but still extensive marine processes. Such processes may have a significant influence on the distribution and abundance of forage fish in the area, which in turn could drive the distribution, abundance and potentially survival of guillemot and razorbill during the chick rearing/moult period. Given the uncertainty surrounding our understanding of these interactions, wider changes that may occur as a result of the presence of the Hornsea Four area (e.g. local biodiversity and trophic interactions), and response of guillemot and razorbill to the project over its lifetime, it remains unclear whether such effects could have a net-negative or net-positive impact upon these species.