

Hornsea Project Three  
Offshore Wind Farm



## Hornsea Project Three Offshore Wind Farm

Response to the Secretary of State's Minded to Approve Letter  
Appendix 2: Kittiwake Compensation Plan

Date: September 2020

Hornsea 3   
Offshore Wind Farm

Orsted

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**Appendix 2: Kittiwake Compensation Plan**

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## Executive Summary

This Kittiwake Compensation Plan (KCP) sets out the proposed compensation relating to potential in-combination effects of Hornsea Project Three (Hornsea Three) on the designated kittiwake population at the Flamborough and Filey Coast Special Protection Area and describes how this will be delivered.

The Applicant will establish and maintain four artificial nesting structures at suitable sites on the east coast of England, a measure which has been evidenced as a viable solution (see Annex 2: Ecological Evidence) for encouraging population growth and will therefore benefit the Eastern Atlantic kittiwake population. Precautionary assumptions have been applied to the estimated impact of the Hornsea Three wind farm on kittiwake and also to the required quantity of additional nesting space, to mitigate uncertainties and give confidence in the compensation. An indicative timeline of activities is provided for implementing the kittiwake artificial nesting structures. Robust monitoring and adaptive management measures have also been presented to give confidence that it remains effective through the operating life of the wind farm.

Wording is provided that will incorporate the compensation requirement into the Development Consent Order with discharge of this requirement to be based on approval of a submitted Kittiwake Implementation and Monitoring Plan (KIMP) 12 months prior to the commencement of the authorised project. Further to the “Minded to Approve” letter issued by the Secretary of State for the Department for Business, Energy and Industrial Strategy on 1 July 2020, this plan secures the delivery of compensatory measures for the Hornsea Three wind farm application.

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## Acronyms

Acronyms	Description
AEol	Adverse Effect on Integrity
CFD	Contract for Difference
DECC	Department of Energy and Climate Change
Defra	Department for Environment, Food and Rural Affairs
BEIS	Department for Business, Energy and Industrial Strategy
DCO	Development Consent Order
EC	European Commission
FID	final investment decision
FFC	Flamborough and Filey Coast
HRA	Habitats Regulations Assessment
KCP	Kittiwake Compensation Plan
KIMP	Kittiwake Implementation and Monitoring Plan
JNCC	Joint Nature Conservation Committee
MMO	Marine Management Organisation
OOEG	Offshore Ornithology Engagement Group
OWSMRF	Offshore Wind Strategic Monitoring and Research Forum
PINS	Planning Inspectorate
RAS	Re-trapping Adults for Survival (studies)
RSPB	Royal Society for the Protection of Birds
SoS	Secretary of State
SNCB	Statutory Nature Conservation Body
SPA	Special Protection Area

## 1. Introduction

- 1.1 This kittiwake compensation plan (KCP) sets out compensation for potential collision impacts on breeding adult black-legged kittiwake *Rissa tridactyla* (kittiwake) associated with the Flamborough and Filey Coast (FFC) Special Protection Area (SPA). It has been developed in support of Hornsea Three in response to the Development Consent Order (DCO) “Minded to Approve” letter issued by the Secretary of State (SoS) for the Department for Business, Energy and Industrial Strategy (BEIS) on 1 July 2020 on matters relating to the delivery of compensatory measures for the Hornsea Three Application.
- 1.2 The Secretary of State, in his decision, has identified that an adverse effect on integrity (AEol) cannot be ruled out, in-combination, on the kittiwake feature of the FFC SPA, given his consideration of the potential impact contribution from Hornsea Three on this feature (namely, a potential annual collision mortality rate of 65-73 birds).
- 1.3 This plan sets out the proposed compensation relating to the Applicant’s contribution to the in-combination effects on the kittiwake population designated at the FFC SPA, and how this can be secured and delivered. A draft DCO requirement for the delivery of the kittiwake compensation (see Section 2) has been proposed that the Secretary of State can include in the final DCO.
- 1.4 The KCP presents the framework and roadmap for further work that will be required to finalise and implement the compensatory measure, and is supported by technical Annexes 2 (Ecological Evidence) and 3 (Site Selection and the Pathway to Securement) relating to evidence, feasibility and current level of progress with regard to land access and necessary approvals for the implementation for the measure.
- 1.5 The KCP also provides a summary of the consultation carried out to date on developing this measure and identifies how, following the grant of development consent, the Applicant will continue to work with relevant stakeholders, regulatory authorities and landowners to obtain the necessary land rights, define the precise implementation and monitoring details, and obtain the necessary consents and permissions for the measure.

### **Compensation**

- 1.6 The following text provides a summary of the compensation for Hornsea Three wind farm. Further detail on the compensation measure is provided throughout Section 2 of this KCP.
- 1.7 The Habitats Regulations Assessment (HRA) for Hornsea Three wind farm established (Ref: Annex B to Appendix 4 of the Applicant’s Response to SoS: Updated Ornithological Mitigation Scenario (Feb 2020)) an impact of up to four adult breeding kittiwake from the FFC SPA could be subject to collision mortality per annum, based on the application of a precautionary set of evidence-based assumptions relating to bird densities, collision risk modelling parameters, apportioning and breeding assumptions. Within this assessment it was acknowledged that many of these input parameters were subject to debate with Natural England, and based on the interpretation of the advice from Natural England, a potential upper impact range of 65-73 was identified. The SoS in his Appropriate Assessment based his decision on the most precautionary end of the potential impact range (i.e., an estimate of 65-73 adult birds).

- 1.8 The Applicant has consulted with a range of stakeholders since the 1 July 2020 letter (Appendix 5 to the Applicant's Response to the SoS' Minded to Approve Letter) and established that developing a compensation measure focused on delivering artificial nesting structures is an appropriate way forward. Accordingly, the Applicant will implement four artificial nesting structures designed specifically for kittiwake within search zones identified on the east coast of England (in the North East and East Anglia – Section 3.31).
- 1.9 In providing four compensatory structures at a minimum of two geographically distinct zones, with each capable of delivering the upper estimate for level of compensation required (i.e., 73 breeding adults), the Applicant is ensuring that significant contingency is built into the measure to provide the necessary confidence that it will substantively offset the impact in all actual impact scenarios from the Hornsea Three wind farm.
- 1.10 The process to quantify the scale of required compensation has been explored in full in Annex 2: Ecological Evidence and annexes which outline the population calculations undertaken to determine the scale of the compensation required. Several factors are involved in the breeding population required to achieve 73 breeding adults per year, summarised below:
- Breeding productivity – the average number of young produced by each breeding pair;
  - Age at which birds start to breed (age of recruitment);
  - Survival rate of birds which varies by age; and
  - Breeding dispersal.
- 1.11 Annex 2: Ecological Evidence has established a precautionary, yet realistic, set of assumptions on which to calculate the number of breeding pairs required to deliver a minimum of 73 breeding adults. The population calculation determined that 404-467 pairs of breeding kittiwake would be required to subsequently produce 73 breeding adult birds. Therefore, the proposed scale of the compensatory measure will be such that it can provide sufficient nesting space to support at least 404-467 breeding pairs at each of the structures taken forward (i.e., it has the potential to deliver four times the upper end of the SoS' impact estimate).
- 1.12 The Applicant has undertaken initial site selection and feasibility studies that have established suitable areas of search in the North East Zone, and the East Anglia Zone (as defined at para. 3.33 below) based on the population dynamics of existing kittiwake colonies and range of potentially suitable coastal frontage.
- 1.13 Following the grant of development consent, the Applicant will undertake a number of activities in parallel relating to the establishment of an Offshore Ornithology Engagement Group (OOEG). The OOEG will bring together relevant stakeholders (see Section 1.14) to facilitate discussions relating to the finalisation of the precise location and design of the artificial nesting structures and the work to secure the necessary permits and land rights for the construction, operation and maintenance of the structures (see Annex 3: Site Selection and Pathway to Securement). The final detail of the compensation measure will be presented within a Kittiwake Implementation and Monitoring Plan (KIMP) that will be submitted to the Secretary of State prior to the commencement of authorised development. An outline version of the KIMP which describes the contents is included in Annex 1.



## **Stakeholder Engagement**

- 1.14 The Applicant has undertaken extensive consultation with relevant stakeholders (namely, Natural England, the Royal Society for the Protection of Birds (RSPB), the Marine Management Organisation (MMO), the Planning Inspectorate (PINS), Defra, Local Planning Authorities and relevant local organisations) between 1 July and 30 September 2020 regarding compensation for Hornsea Three. Further detail on this consultation is presented in the Record of Consultation (Appendix 5 to the Applicant's Response to the SoS' Minded to Approve Letter).
- 1.15 It is acknowledged that continued consultation with the key stakeholders is required on a number of aspects relating to the location and design of the structures, and monitoring and adaptive management proposals. These discussions will take place through the OOEG which will comprise the relevant Statutory Nature Conservation Bodies (SNCBs), RSPB, and any delivery partner(s). The OOEG will be consulted on the proposed KIMP prior to submission to the Secretary of State and during the approval process as necessary. The Applicant will engage with and provide reports to the OOEG at least bi-annually in the establishment phase, and as documented in the KIMP throughout the monitoring period. Terms of Reference would be agreed between the parties. The Applicant would be the chair and convener of the OOEG.

## **2. Draft DCO Requirement**

- 2.1 This KCP will form a certified document and commit the Applicant to submitting a KIMP for approval 12 months prior to the commencement of the authorised project and in accordance with its principles as set out within the draft DCO. This commitment is provided as part of a separate compensation schedule within the DCO and the proposed wording is as follows:

1 In this Schedule -

*“the Flamborough and Filey Coast SPA” means the site designated as the Flamborough and Filey Coast Special Protection Area in accordance with the Conservation of Habitats and Species Regulations 2017;*

*“kittiwake compensation plan” means the document certified as the kittiwake compensation plan by the Secretary of State for the purposes of this Order under article 36 (certification of plans and documents etc.);*

### ***Kittiwake implementation and monitoring plan***

*2.—(1) Subject to sub-paragraph (10) no later than 12 months prior to the commencement of the authorised project a kittiwake implementation and monitoring plan must be submitted to the Secretary of State for approval, in consultation with the MMO, the relevant planning authority and the relevant statutory nature conservation body.*

*(2) The kittiwake implementation and monitoring plan must include details of the design, location, and number of artificial nest structures to be provided, an implementation timetable for delivery of the artificial nest structures, and proposals for monitoring, adaptive management and reporting on the effectiveness of the artificial nest structures. The kittiwake implementation and monitoring plan must*

also include proposals for maintenance of the artificial nest structures for the duration of the operation of the generating station comprised in Work No.1.

(3) The kittiwake implementation and monitoring plan must accord with the principles set out in the kittiwake compensation plan relating to the authorised development's contribution to in-combination impacts on the black-legged kittiwake feature at the Flamborough and Filey Coast SPA.

(4) The kittiwake implementation and monitoring plan must be carried out as approved.

(5) The artificial nest structures detailed in the kittiwake implementation and monitoring plan must be constructed prior to first operation of any wind turbine generator comprised in Work No.1, unless otherwise specified in the kittiwake implementation and monitoring plan.

(6) The artificial nest structures must be retained during the operation of the generating station comprised in Work No.1, unless otherwise approved in writing by the Secretary of State.

(7) Prior to the submission of the kittiwake implementation and monitoring plan to the Secretary of State for approval, the undertaker must carry out pre-application consultation in accordance with that set out in the kittiwake compensation plan.

(8) The kittiwake implementation and monitoring plan approved under this Schedule includes any amendments that may subsequently be approved in writing by the Secretary of State.

(9) Any amendments to or variations from the approved kittiwake implementation and monitoring plan must be in accordance with the principles set out in the kittiwake compensation plan and may only be approved in relation to immaterial changes where it has been demonstrated to the satisfaction of the Secretary of State that it is unlikely to give rise to any materially new or materially different environmental effects from those considered in the kittiwake compensation plan.

(10) The requirement in sub-paragraph (1) shall not apply if, on application by the undertaker pursuant to this sub-paragraph, the Secretary of State concludes that the extent of the authorised project the undertaker will construct and operate (which may include a reduction in the number of wind turbine generators from the number comprised in Work No.1) or the nature of its operation will not have an adverse effect on the integrity of the Flamborough and Filey Coast SPA.

### 3. Kittiwake Compensation Plan

#### **European Commission Guidance**

3.1 This KCP takes into consideration guidance from Defra 2012 Guidance<sup>1</sup>, European Commission (EC) 2018 Managing Natura 2000 sites<sup>2</sup>, the Planning Inspectorate's Advice Note Ten<sup>3</sup>, and Tyldesley and Chapman's Habitats Regulations Assessment (HRA) Handbook<sup>4</sup>. The EC 2018 guidance identifies the following criteria must be considered when developing compensatory measures:

- Coordination and cooperation between Natura 2000 authorities, assessment authorities and the proponent of the plan or project;
- Clear objectives and target values according to the site's conservation objectives;
- Description of the compensatory measures, accompanied by a scientifically robust explanation of how they will effectively compensate for the negative effects;
- Demonstration of the technical feasibility of the measures in relation to their objectives;
- Demonstration of the legal and/or financial feasibility of the measures according to the timing required;
- Analysis of suitable locations and acquisition of the rights;
- Timeframe in which the compensation measures are expected to achieve their objectives;
- Timetable for implementation of compensation and co-ordination with the schedule for the project implementation;
- Public information and/or consultation stages;
- Specific monitoring and reporting schedules; and
- The financing.

3.2 These have been addressed through the subsequent sub-headings in this KCP.

#### **Conservation Objectives**

The Conservation Objectives for the FFC SPA are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The population of each of the qualifying features; and,

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<sup>1</sup> Defra (2012), Habitats and Wild Birds Directives: Guidance on the application of article 6(4) - alternative solutions, imperative reasons of overriding public interest (IROPI) and compensatory measures. December 2012.

<sup>2</sup> EC (2018). Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Brussels, 21.11.2018 C(2018) 7621 final.

<sup>3</sup> Planning Inspectorate (2017). Advice Note Ten: Habitat Regulations Assessment relevant to Nationally Significant Infrastructure Projects. November 2017, Version 8.

<sup>4</sup> Tyldesley, D. and Chapman C. (2013-2019). The Habitats Regulations Assessment Handbook, 2019 edition UK: DTA Publications Limited. Note that this publication is an on-line handbook that is updated periodically.

- The distribution of the qualifying features within the site.”

3.3 Given the potential impact pathway of Hornsea Three wind farm for which compensation is required (collision risk to breeding age kittiwake), it is the latter two points only which are of relevance. The evidence presented within this KCP and supporting annexes demonstrates that the proposed measure is predicted to more than offset the estimated impact of Hornsea Three wind farm on the qualifying kittiwake feature (as determined by the SoS). Whilst the measure cannot be undertaken within the FFC SPA, the birds it will generate will assimilate into the regional kittiwake population (southern North Sea which forms part of the wider East Atlantic population) and thereby ensure the coherence of the Natura 2000 network is maintained. Further information to support this is provided in Annex 2: Ecological Evidence.

### **Evidence**

3.4 To avoid repetition, this document should be read alongside Annex 2: Ecological Evidence. However, a brief summary of the key evidence that underpins the compensation measure is provided in this section.

3.5 The Applicant has gathered as much available evidence as possible to develop the artificial nesting structures compensation measure in order to provide the SoS with sufficient confidence at the point of authorising Hornsea Three wind farm that the compensation will be secured. This has included the following key aspects:

- Evidencing that artificial nesting structures are a viable solution for encouraging kittiwake population growth;
- Identifying suitable search areas for the siting of artificial nesting structures;
- Evidencing realistic growth rates and population dynamics associated with establishing a new colony; and
- Evidence for monitoring and adaptive measures to demonstrate the long-term sustainability of the measure.

3.6 The EC Guidance recognises that the feasibility of the identified compensation measure must be based on the best scientific knowledge available. The novelty of developing compensation for a seabird species in the UK increases the importance of pre- and post-implementation monitoring. There will, following award of consent, be a phase of further evidence gathering followed by monitoring which will continue through operation. Where necessary, monitoring and adaptive management will ensure, in line with Guidance, that the proposals are developed in the most appropriate manner and can be flexible to enable modifications to be made where evidence suggests it is merited. It is important to recognise that the compensatory measure proposed has the potential to offset four times the SoS' upper estimate of kittiwake mortality; this high level of precaution must be factored in when considering any uncertainty in the measure. These topics are covered in the following sections of the report.

### **Evidence roadmap**

3.7 As identified above, the Applicant will continue to engage with stakeholders via the OOEG following consent award. The focus of engagement will be to consult on the approach to finalising the artificial nesting structure proposals, with specific regard to defining the:

- Location of structures;
- Design of structures; and
- Monitoring and adaptive management detail.

3.8 The process for identifying, securing and finalising a suitable location, structure design and monitoring and adaptive management measures (in so far as the ecological aspects are concerned) is discussed further in paragraphs 3.32- 3.37 of this report with full details provided in Annex 2: Ecological Evidence. Considerations of monitoring plans and adaptive management options have also been provided in Annex 2 to demonstrate the long-term sustainability of the artificial nesting structures as a compensatory strategy.

3.9 The timescale within which this further evidence will be developed and fed into the KIMP is detailed within the indicative outline programme (Section 3.10) (Table 1.2).

#### **Timescales for establishment of results of measure**

3.10 The compensation measure comprises the delivery of four artificial nesting structures each capable of supporting a minimum of 404-467 pairs of nesting kittiwake. The provision of these structures does not complete the compensation, as the impact relates to the estimated loss of 65-73 adult (breeding age) kittiwake per annum. For the compensation to be effective it should deliver 73 adult (breeding age) kittiwake into the regional (East Atlantic) population per annum. Therefore, the colonisation rate and subsequent chick maturation rate are key influencing parameters in determining how long it may take for the measure to be “established<sup>5</sup>.”

3.11 Based on the evidence provided in the Ecological Evidence report (Annex 2) and as indicated within the indicative outline programme (Section 3.31), the Applicant has factored in the necessary lead in time such that the compensatory measure will deliver the appropriate number of adult (breeding age) kittiwake into the regional population to offset the impact, thereby maintaining the coherence of the Natura 2000 network.

3.12 The Applicant is developing artificial nest designs which maximise the potential for success of the measure. It is the intention that where two structures are located within the same search zone there will be different designs adopted (whilst adhering to the design criteria as set out in Section 3.38 of this plan). Furthermore, the Applicant is also committed to developing a detailed monitoring and adaptive management plan to track the effectiveness of the artificial nests as part of the KIMP. If it becomes clear that some of the assumptions relating to key parameters that influence the establishment of the measure are not being realised as anticipated, adaptive measures (see Section 3.3) will be implemented to improve effectiveness.

#### **Monitoring Approach**

3.13 Monitoring forms an integral component of the compensatory measure and will be developed with relevant stakeholders through the OOEG.

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<sup>5</sup> The compensation will be established once the structures are hosting a minimum of 404-467 nesting pairs between them.

- 3.14 The success in deployment of the kittiwake artificial nest structures will be monitored through observations of the number of breeding birds and their breeding success. Monitoring of these rates will follow the standard methods provided by Walsh *et al.*, (1995) and specified by the Joint Nature Conservation Committee's (JNCC) Seabird Monitoring Programme which acts as the hub of seabird population information. All relevant monitoring data collected during the project will be contributed to the JNCC's Seabird Monitoring Programme. Collection of seabird data in this format will permit comparisons to be made with on-going monitoring at existing colonies along the east coast of England, including that undertaken by the RSPB at the FFC SPA (Babcock *et al.*, 2018). In order to monitor the number of breeding birds and their breeding success whole colony counts and productivity monitoring will be conducted at the artificial nest sites.
- 3.15 Monitoring will first be undertaken at existing kittiwake colonies adjacent to the proposed artificial nesting structure locations to provide context for the performance of the artificial nests once they have been constructed. This monitoring will also contribute to the assessment of locations (e.g. good productivity). Post construction, monitoring of the artificial nesting structure will be conducted to record both breeding birds and breeding success of the first breeding season and will continue for the lifetime of the offshore wind farm project (while also informing adaptive management and maintenance). The precise nature of monitoring at the structure will be influenced by the final form and locations the compensation measure takes. Monitoring will also be undertaken at adjacent existing colonies to determine whether population trends at artificial nest structures are colony or site specific. Details on how whole colony counts and productivity monitoring will be implemented are provided in the Ecological Evidence report (Annex 2).
- 3.16 Monitoring of the artificial nesting structures will inform the adaptive management programme (see Section 3.13) and influence any potential maintenance work required on the structures. With reference to adaptive management, monitoring of breeding pairs and breeding success each breeding season will likely determine the employment of adaptive management the following season. However, the point of intervention, when adaptive management should be incorporated, will be an area led by the Applicant and explored by the OOEG members.
- 3.17 In addition to the monitoring of compensation effectiveness outlined above, the deployment of artificial nesting structures for kittiwake also presents an opportunity to empirically test various design features and adaptive management options with respect to the colonisation and productivity of the colony. For example, the aspect and width of the nesting ledge in relation to breeding success. Furthermore, providing access to birds and their nests through structure design can facilitate further research opportunities, such as studies looking at diet and projects to increase understanding of adult survival. It is also important to note that such research opportunities have the potential to contribute to research opportunities identified for the Offshore Wind Strategic Monitoring and Research Forum (OWSMRF) (Ruffino *et al.* 2020), specifically in relation to the following research components;

- RO3.1c - Undertake targeted empirical data collection as informed by the sensitivity analyses (RO3.1b)
- RO3.3c - Deploying strategic adult kittiwake mark-recapture at multiple colonies, and analyses of re-sighting data (Re-trapping Adults for Survival (RAS) studies)
- RO3.3d - Deploying strategic chick mark-recapture at multiple colonies, and analyses of re-sighting data
- RO3.9b - Regional comparison of kittiwake diets during the breeding season: field studies

3.18 As stated above, the monitoring taken forward will be consulted on with the OOEG and detailed in the KIMP that will be submitted for approval prior to the commencement of the authorised project.

#### **Adaptive management**

3.19 Adaptive management is an iterative, post-consent process which combines management measures and subsequent monitoring with the aim of improving effectiveness whilst also updating knowledge and improving decision making over time. Adaptive management will be an important component of the compensation measure and will be used as a method to address unforeseen issues or deviations from expected time scales (i.e. colonisation rate of structure).

3.20 It is worth noting at this stage that any adaptive measures will be thoroughly discussed and explored with relevant stakeholders as part of the OOEG prior to the implementation of any option. Further detail on each adaptive management option is presented in Annex 2: Ecological Evidence, however an overview is provided in the table below. All known issues and risks will be mitigated through good design of the structure and routine maintenance; this table identifies measures which may be implemented through the operational lifetime of the structures. Additional adaptive measures associated with the artificial nesting structures which may be considered following the consultation process associated with the development of the KIMP are set out in Table 1.1.



Table 1.1 Additional adaptive measures which may be considered associated with the development of the Kittiwake Implementation and Monitoring Plan

Issue	Primary cause	Adaptive Management Option
Lack of colonisation / partial colonisation	Kittiwake potentially not finding the structure	Calls of kittiwake played at nesting structures <sup>6</sup>
		Decoys of kittiwake and nest on nesting structures <sup>6</sup>
	Decline/lack of breeding success in local pre-existing kittiwake population	Relocation of nesting structure
	Lack of suitable nesting material in proximity to structure	Provision of nesting material (mud, dry vegetation etc.)
Predation pressure leading to lower productivity <sup>7</sup>	Avian predation	Addition of anti-bird spikes or similar to deter large gulls from landing on the structure
	Mammalian predation	Installation of predator fencing
Abandonment following colonisation (Following investigation, e.g., from predation, disturbance or interference):	Avian predation	Addition of anti-bird spikes or similar to deter large gulls from landing on the structure
	Unauthorised human access	Security cameras and fencing to prevent access, on site management explored
	Consistent disturbance not possible to manage otherwise	Relocation of nesting structure

<sup>6</sup> Kittiwake calls, decoys and nests will likely form part of the initial design process for the artificial structures (Annex 2). However, their use may be adapted and subsequently monitored during the lifetime of the measure.

<sup>7</sup> Initial nesting structure design will incorporate features aimed at preventing avian and/or mammalian predation. However, it is acknowledged that the approach to predator deterrents may need to be adapted if initial process is unsuccessful or predators are able to surpass initial deterrents. If this is found to be the case as a result of site monitoring, solutions will be discussed within the OoEG on how to resolve the issue, with the aim that adaptations could be made to the structure during the non-breeding season when birds are absent.



Issue	Primary cause	Adaptive Management Option
	Decline/lack of breeding success in local pre-existing kittiwake population	Relocation of nesting structure
Low productivity rates at colony	Eggs are being lost	Adaptation of structure
	Localised short-term prey shortage	Supplemental feeding as a short-term measure during the breeding season.
	Medium to long-term prey shortage	Relocation of structure to a suitable location. Local stakeholders will be engaged through the OOEG and additional measures agreed which are directly associated with, and can be implemented from, on or local to the artificial nest structures.

- 3.21 Multiple adaptive management measures will be explored prior to the construction of the artificial nesting structure as it is important to consider the differences between intelligent structure design (which is covered in a separate section) and maintenance activity<sup>8</sup>, and adaptive management.
- 3.22 Natural England have raised the concern that long-term prey resource challenges associated with climate change and commercial fisheries may constrain productivity at the structure. The site selection process put great weight on locations where productivity is favourable and the population is expanding to give confidence that this would not be an issue in the short to medium term. Different regions were chosen for structure locations to mitigate against regional changes in forage fish populations. Monitoring of kittiwake diet at the structures will be carried out to understand the site-specific importance of local prey and will be compared with adjacent natural colonies. The results will be shared with local stakeholders and with the OOEG.
- 3.23 Acknowledging that there is natural large inter-annual variability in prey resource (forage fish recruitment), there may be short term (1-2 years) opportunities to enhance the availability of prey at or adjacent to the structures in the breeding season. This is discussed in more detail in the Ecological Evidence report (Annex 2 to this KCP) and exact methods will be discussed with the OOEG.
- 3.24 In the mid to long term, the results of the initial diet studies together with fisheries data (Inshore Fisheries and Conservation Authorities (IFCA), International Council for the Exploration of the Sea (ICES) etc.) could be used to inform temporary measures to increase productivity at the structures. The data collected will be shared with relevant advisors and authorities in order to inform consideration of fisheries management if required.
- 3.25 Any long-term challenges to the effectiveness of the artificial nest structures relating to prey resource should be viewed in a North Sea context and in consideration of natural variability and climate change. In the event that the Applicant, in consultation with the OOEG, concludes that the artificial nesting structures are ineffective in delivering compensation and after all adaptive management options relating to the performance of the structures have been exhausted, the Applicant will consult with the OOEG with the aim of identifying alternative long-term compensation measures (including but not limited to feasible prey availability measures) that are securable, deliverable and proportionate to the impact on the kittiwake at FFC SPA. In such circumstances, the Applicant will update the KIMP and will carry out the updated Plan as approved.
- 3.26 Adaptive management measures are designed to support the compensation measure once functioning (post construction) as a way of furthering the success and supporting resilience of the measure (Ecological Evidence Report: Annex 2 to this KCP)). As mentioned above, adaptive management will be linked closely to the monitoring plan, the full detail of which will be agreed through the OOEG and set out within the KIMP.

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<sup>8</sup> It is worth noting at this stage that ad-hoc maintenance, not linked to adaptive management, to the structure will also be highlighted by the monitoring plan. This will allow any remedial works or repairs to be conducted during the non-breeding season when breeding birds are not present at the structure (further information is provided in Annex 2).

### **Success criteria**

- 3.27 As set out by the evidence presented in Annex 2: Ecological Evidence, provision of additional artificial nesting opportunities for kittiwakes within the specified search zones is expected to enhance productivity and therefore be effective as a compensatory measure to meet Article 6(4) requirements. The establishment of breeding colonies at these structures would produce young that would become part of the wider East Atlantic population of kittiwake from which recruits to FFC SPA would derive.
- 3.28 As identified at the outset of this KCP, the SoS based the Appropriate Assessment conclusions for the potential impact of Hornsea Three on the breeding adult kittiwake associated with the FFC SPA, on a precautionary estimated impact range of 65-73 breeding adult kittiwake. A breeding population of 404-467 breeding pairs is predicted to provide the number of chicks that would survive to adulthood to offset the impact of Hornsea Three wind farm. There are examples of artificial nest sites supporting breeding populations of this size. This number of birds (73) would be required to be produced each year (on average) that the Hornsea Three wind farm is in operation (and therefore when the impact may take place).
- 3.29 The compensation measure is a long-term commitment, with monitoring and adaptive management built in to ensure the long-term success of the measure. Therefore, it is likely that the 'success' criteria will have both a short-term objective based around uptake levels / evidence of breeding pairs or fledglings, and then a longer-term objective linked to the continued success of the colony over time. A key function of the OOEG will be to help define appropriate and proportionate success criteria, the detail of which will be presented within the final KIMP.
- 3.30 A timeframe has been developed with the above considerations in mind to ensure not only that the delivery of the measure is as planned, but that relevant monitoring of kittiwake is undertaken at appropriate timescales to maximise its usefulness to the project and the wider scientific community.

### **Feasibility**

- 3.31 This section provides an account of different components that combine to demonstrate that the compensation measure proposed is feasible. It includes a summary of the scientific evidence to support the delivery of the measure, technical detail of the measure (where relevant), any necessary land acquisition, consenting requirements, and funding to demonstrate the measure is financially deliverable.

### Site selection and consideration of alternatives

- 3.32 Site selection and the consideration of alternatives for artificial nesting structure locations, identifying the ecological, land acquisition and technical constraints and requirements, have been outlined in further detail in the Site Selection and Pathway to Securement report (Annex 3 to this KCP). This has resulted in the identification of two preferred search zones within which further work is being undertaken to establish specific sites on which artificial nests will be developed.<sup>9</sup> Where future work, for example progression of land agreements, is required this has also been identified in Annex 3.
- 3.33 The two preferred zones which have been identified are Zone 1 'East Anglia', comprising the coastline between Lowestoft and Sizewell, and Zone 2 'North-East', comprising the Tees Estuary to south of Seaham coastline (see Figures 2 and 3, Annex 3). The constraints and requirements established as a part of the site selection process have been led by the evidence-based approach outlined in the Ecological Evidence report (Annex 2 to this KCP). Initial consultation has commenced with the relevant local planning authorities, conservation and ornithological groups with local knowledge and expertise. No significant obstacles to development have been identified.
- 3.34 A full account of the ecological criteria for the site selection process undertaken to date is provided within Annex 3: Site Selection and Pathway to Securement, with reference to Annex 2: Ecological Evidence. The purpose of site selection has been to identify an area to host artificial nesting sites that will be occupied by new recruits in the English southern North Sea, whilst contributing to an increase of breeding adults to the Eastern Atlantic kittiwake population. The principles influencing this initial site selection work as detailed in Annex 3 comprise:
- Locations which kittiwake with certainty will be able to find (for example either locations where there are existing (smaller) populations of kittiwake, or where there are factors which attract kittiwake);
  - Locations where there is evidence of stable/increasing productivity and evidence of an expanding population (as a proxy for favourable prey resource);
  - Locations where there is a lack of existing natural or man-made habitat (locations where kittiwake are attempting to nest in unfavourable conditions such as ground nesting at RSPB Minsmere are particularly promising);
  - Waterfront locations away from urban housing which minimise human interaction and where purpose built artificial nests can ideally overhang water, to mimic natural nesting conditions as far as possible.
- 3.35 As both preferred zones are in the onshore to nearshore environment the key steps to land acquisition have been identified below. However, in the event that voluntary agreement with the relevant landowner(s) cannot be reached, compulsory acquisition powers are available to the Applicant. The Applicant is well advanced in Phase One in developing a draft shortlist of sites, and planned timings for Phase Two are set out in Section 3.10.

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<sup>9</sup> Natural England provided written advice to the Applicant (24 Sep 2020) stating that they were 'broadly satisfied with the two search areas identified'.

**Phase One:**



**Phase Two:**



3.36 Selecting two geographically distinct zones will buffer against localised events that may impact the colony. The establishment of multiple new colonies has the potential to also minimise the lead-in time to achieving the size of compensatory population required.

3.37 The detail of the continued site selection process will be presented within the KIMP that will be developed in consultation with relevant stakeholders (through the OOEG).

**Design and construction**

3.38 The design specifications for the artificial nesting structures are at this stage unconstrained. They may take the form of a bespoke structure or be a modification to an existing building or piece of infrastructure (such as a seawall). Where two structures are located in the same search zone, the intent is that they are different designs to maximise the opportunity for kittiwake to colonise. The structure designs will likely be influenced by landowner negotiations, landscape character, and existing environment of the selected location. The Applicant is confident that there is sufficient empirical evidence of successful examples of both bespoke structures and modifications to existing structures (see Section 5.4 of Annex 2: Ecological Evidence) that whichever solution is required it will be successful providing it meets the key design criteria, based on kittiwake ecology, as follows:

**Physical design elements:**

- Horizontal ledges 20 cm by 30 cm;
- Vertical back wall;
- Walls or partitions between groups of nests and overhang or roof to buffer weather conditions (while maintaining visibility of neighbouring birds); and
- Height above nesting ledge >30 cm.

**Location:**

- Nest adjacent to/ above harbour waters/ sea;
- >2m above ground or mean height water level; and
- Avoid south facing aspect to avoid potential over exposure to the sun.

3.39 The following broad design concepts are all considered to have the potential to meet the necessary design criteria (with full detail being provided in Section 5.4 of the Ecological Evidence report) and will be considered within the KIMP:

- Purpose built structure or tower with ledges accessible and visible from inside;
- Modified wall structure to allow access to nests;
- Purpose built wall; and
- Tower structure with shelves.

3.40 Constructing a nesting structure which allows access to the nests will allow for enhanced monitoring and research opportunities.

3.41 The Applicant will work with the OOEG when developing the final design for the structures and draw upon the number of examples presented in Annex 2: Ecological Evidence to ensure there is opportunity for stakeholders to feed into the process, with the final scheme set out in the kittiwake monitoring and implementation plan. An initial analysis which considers the different design options used at existing kittiwake examples is included in Annex 2.

3.42 The initial structure design will allow for appropriate monitoring, adaptive management measures and any maintenance which may be required. This information will be provided within the KIMP, along with the evidence on which it is based. Furthermore, information in relation to health, safety and environment considerations, including health and safety during monitoring will also be provided in-line with industry standards.

### **Funding**

- 3.43 The Applicant has identified the costs associated with the development, construction, operation and decommissioning of the proposed compensation measure. These costs have been included within a detailed Funding Statement (Appendix 4). This statement is supplemental to the Funding Statement from May 2018 submitted as part of the suite of Application documents. The Funding Statement(s) outline the overall project cost based on the capital expenditure and operational expenditure assumptions in the “Review of Renewable Electricity Generation Cost and Technical Assumptions”<sup>10</sup> (DECC 2016). The Funding Statement(s) also detail the corporate structure and a robust explanation to allow the Secretary of State to conclude that the necessary funding to deliver the compensation measure can be secured.

### **Planning approach**

- 3.44 The Applicant is considering any planning constraints as part of the site selection process. The Applicant has already had high level engagement with the relevant planning authorities and will use the pre-application advisory service. Where appropriate the Applicant will engage with independent planning consultants to review planning policy to determine the likelihood of success of obtaining planning consent in any given location. Once the final location has been identified, the Applicant will proceed with obtaining planning permission under the Town and Country Planning Act 1990.
- 3.45 If any of the sites identified are coastal locations such that there are overlapping regulatory authorities, the Applicant will engage with both the Marine Management Organisation and the relevant Local Planning Authority pursuant to the Coastal Concordat (November 2013). This will determine whether a Marine Licence application is also required.
- 3.46 The requisite consents will address any proposed decommissioning requirements, specifically the requirement to submit a decommissioning plan upon cessation of generation of the windfarm.
- 3.47 The outline programme (as presented in Section 8) identifies that the consenting process could realistically be completed within a timeframe that enables the measure to be implemented and starting to host breeding kittiwake sufficiently in advance of the impact occurring.

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<sup>10</sup> DECC, 2016. Accessed at: <https://www.gov.uk/government/publications/arup-2016-review-of-renewable-electricity-generation-cost-and-technical-assumptions>

### **Indicative outline programme**

- 3.48 Table 1.2 presents an indicative outline programme capturing the key activities associated with the delivery of the compensation. Implementation of artificial nesting structures will be subject to successful progression of the Hornsea Three project. It is recognised that there is uncertainty in regard to reaching final investment decision (FID) for the Applicant, including such factors as Contract for Difference (CFD) award. The timing of implementation of artificial nesting structures will be subject to the outcome of these processes. However, the ultimate timing of the delivery of artificial nesting structures in relation to the commencement of works, will not be affected. In the period following the grant of development consent up to FID, the Applicant commits to continuing to develop the measure ahead of FID, in consultation through the OOEG including identification of precise locations, carrying out any agreed pre-construction monitoring, and progressing consent applications and land agreements, to facilitate the installation of infrastructure within the required timeframe following receipt of FID.



Table 1.2 Indicative outline programme

Detail	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	2023	2024	2025	2026	2027/8
Agree form of compensation with stakeholders															
Preliminary discussions with LPA and landowners															
Submission of KCP to Secretary of State															
Consent award															
Preferred colony location monitoring															
Consultation on evidence gaps, nesting platform design and locations															
Finalise nest design & location of compensation, and planning application															
Final engineered solution															
Submission of kittiwake implementation and monitoring plan for approval															
Consent for nesting platforms and landowner agreements															
Implementation of nesting platforms - construction programme (including tender process)															

Detail	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Q4 2022	2023	2024	2025	2026	2027/8
Artificial Nest Structure is commissioned and colonisation begins															
Commencement of wind farm works (onshore) - indicative															
Monitoring of nest uptake and productivity															
Time by which 1st chicks reach breeding age															
First full operational year															

### Secured compensation

- 3.49 The law requires the SoS to either ensure that compensation measures are secured, or to be confident that they can be secured at the point of authorising the relevant project. There is an important distinction between securing the compensation measures and its subsequent delivery. The Applicant's approach has been to ensure the SoS can rationally believe that he can fulfil his duty to secure the compensation measure of artificial nesting.
- 3.50 The legal position on timing of delivery of compensation measures was confirmed by the SoS in relation to the Able Marine Energy Park Order 2013. Two key principles arising from this decision are (i) it is accepted that the compensation does not need to be delivered before any development commences; and (ii) it countenances a time-lag where there is damage/harm to the Natura 2000 network with compensation fully functioning later. As clearly stated above, the Applicant proposes to deliver the physical artificial nesting structures before the impact occurs in line with the roadmap presented in Section 3.48.

## 4. Conclusion

- 4.1 The SoS has indicated (para 7.59 of the Minded to Approve Letter (EN010080) of 1 July 2020) that he is minded to give consent for the Hornsea Three wind farm to proceed subject to receiving satisfactory evidence of compensation measures to be put in place to ensure compliance with the Conservation of Habitats and Species Regulations. In relation to this, the SoS therefore requires a detailed Compensation Plan which gives confidence that any compensatory measures proposed will be sufficient to offset the potential impact to the kittiwake feature of the FFC SPA and thereby maintain the coherence of the network of SPAs designated, at least in part, for kittiwake.
- 4.2 The impact that should be compensated is estimated by the SoS to be between 65-73 adult kittiwakes with this being the upper number of adult birds that could suffer mortality through collision each year once Hornsea Three becomes fully operational. This KCP has identified that (based on predicted productivity and survival rates) 65-73 breeding age adults can be provided from structures that are capable of hosting between 404-467 pairs of nesting kittiwake. The Applicant has committed to ensuring that each artificial nesting structure is, therefore, capable of supporting this number of breeding pairs. Furthermore, the commitment to delivering a total of four artificial nesting structures in appropriate coastal locations would, therefore, lead to a contribution to the East Atlantic kittiwake population well in excess of the upper estimate of Hornsea Three's impact, and therefore that this is a feasible compensatory measure.
- 4.3 It is expected that the majority of young produced at these artificial nesting structures will be recruited into the southern North Sea population (a sub-population of the East Atlantic kittiwake population) of kittiwakes which in turn provides the breeding adult birds for colonies on the east coast of England. By encouraging sufficient additional breeding, the overall breeding population will increase by at least the same amount as that predicted to be lost through collision mortality.

- 4.4 This KCP and supporting evidence demonstrates that the delivery of artificial nesting structures is not only an effective, feasible and securable measure but that it will be functioning<sup>11</sup> prior to the impact occurring.
- 4.5 Furthermore, through the long-term commitment to providing the compensation at a scale that has the potential to deliver four times the estimated impact from Hornsea Three, in addition to appropriate monitoring and adaptive management measures to ensure success, this compensation option will be sustainable for at least the operational lifetime of the wind farm and hence the period within which collision mortality would occur.

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<sup>11</sup> The compensation measure will be functioning when the structures are commissioned in line with the design criteria in the Kittiwake Compensation Plan.