

East Anglia TWO Kittiwake Implementation and Monitoring Plan

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Revision Summary				
Rev	Date	Prepared by	Checked by	Approved by
1	19/01/2024	SPR / GoBe Consultants	Rachael Devine	Lisa Western
2	27/02/2024	SPR / GoBe Consultants	Rachael Devine	Lisa Western
3	14/03/2024	SPR / GoBe Consultants	Rachael Devine	Lisa Western

Description of Revisions			
Rev	Page	Section	Description
1	All	All	New Document
2	7, 9, 10, 12, 13, 21	1.4, 2, 5.1, 6	'nests' changed to 'nest spaces' or 'breeding pairs'
2	6, 7	1.3.2, 1.4	Paragraphs revised to describe consultation that has happened
2	8, 21	1.5.1, 5.4	Change of tense
2	8, 9	1.5.1	Updated description of Annexes to East Anglia TWO KIMP and Norfolk Projects KIMP
2	9, 10, 17, 18	1.5.1, 2, 3, Table 3, 5.3.1	Delete/change of 'proposed' to reflect current existence of installed nesting structures
2	19, 20	Figure 3, Figure 4, Figure 5	Updated to show nesting structures installed in February 2023
2	23	8.2	Deleted reference to 2023 ringing feasibility survey
2	25	9	Additional paragraph describing adaptive management measures for implementation prior to 2024 breeding season
3	6	1.3.1	Added details of KCSG meeting chair
3	10, 12	2, 5.1	Change of description of compensation requirement to 'provide artificial nesting structures of sufficient size to support 100 breeding pairs'
3	13	5.1, Table 2	Text added emphasising simplistic nature of ration comparison. Rounded up Hornsea Three ratio to 1:26
3	25	9	Updated adapted management proposals to reflect increased deployment of eight decoy kittiwake models

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ABP	Association of British Ports
AON	Apparently Occupied Nests
BEIS	Department for Business, Energy & Industrial Strategy
CRM	Collision Risk Modelling
DCO	Development Consent Order
DEFRA	Department of Environment, Food and Rural Affairs
DESNZ	Department for Energy Security and Net Zero
EIA	Environmental Impact Assessment
FFC	Flamborough and Filey Coast
HRA	Habitat Regulations Assessment
KIMP	Kittiwake Implementation and Monitoring Plan
KCSG	Kittiwake Compensation Steering Group
LEEF	Lowestoft Eastern Energy Facility
MMO	Marine Management Organisation
NE	Natural England
RSPB	Royal Society for the Protection of Birds
SoS	Secretary of State
SPA	Special Protection Area

1. INTRODUCTION

EAST ANGLIA TWO LIMITED has been granted consent to construct, operate and maintain the East Anglia Two offshore windfarm (hereafter East Anglia TWO). EAST ANGLIA TWO LIMITED is a wholly owned subsidiary of ScottishPower Renewables (UK) Limited which trades as ScottishPower Renewables. It is acting as agent to coordinate the implementation of a number of offshore projects applied for by subsidiary companies. The application for Development Consent was submitted to the Planning Inspectorate in October 2019, with consent for the project being awarded on 31st March 2022. East Anglia TWO is a discrete project with its own Development Consent Order (DCO); however, it shares a portion of the offshore cable corridor, has the same landfall location, and shares an onshore cable route with the East Anglia ONE North offshore windfarm project (hereafter East Anglia ONE North). East Anglia TWO will be comprised of up to 75 wind turbines, located in the Southern North Sea approximately 32 km from the Suffolk coast.

The DCO for East Anglia TWO was granted on the basis of the Project delivering compensation for kittiwake associated with the Flamborough and Filey Coast (FFC) Special Protection Area (SPA).

This document sets out the Kittiwake Implementation and Monitoring Plan (KIMP) for the delivery of the East Anglia TWO kittiwake compensation. ScottishPower Renewables are working in collaboration with East Anglia ONE North and Vattenfall, who are developing the Norfolk Boreas and Norfolk Vanguard Offshore Windfarms (hereafter referred to as the Norfolk Projects), for the delivery of kittiwake compensation. Further details on the ScottishPower Renewables and Vattenfall collaboration are provided in Section 1.2.

1.1. Consent Requirements

This KIMP has been prepared pursuant to Paragraph 3 of Schedule 18, Part 1 of the East Anglia TWO Offshore Wind Farm Order 2022 (East Anglia TWO DCO, hereafter referred to as the “compensation schedule”. The relevant requirements this KIMP aims to discharge are summarised below:

Following consultation with the Kittiwake Compensation Steering Group (KCSG), the KIMP must be submitted to and approved by the Secretary of State ((SoS) in consultation with the MMO, the local planning authority for the land containing the artificial nest site, and the relevant statutory nature conservation body). The KCSG must be consulted further as required during the approval process. The KIMP must be based on the strategy for kittiwake compensation set out in the kittiwake compensation plan ¹ and include;

- a) *details of the location where compensation measures will be deployed, why the location is appropriate ecologically and likely to support successful compensation, and details of agreements demonstrating how the land and/or rights will or have been secured to deliver the ecology objectives of the KIMP;*
- b) *details of designs of the artificial nest site including the type of nesting structure; and how risks from avian or mammalian predation and unauthorised human access will be mitigated;*
- c) *an implementation timetable for delivery of the artificial nest structure that ensures relevant compensation measures are in place to allow four full kittiwake breeding seasons prior to the operation of any wind turbine generator forming part of the authorised development;*
- d) *details of the proposed ongoing monitoring of the measures including: survey methods; survey programmes; success criteria; recording of KCSG consultations and project reviews; adaptive management measures and details of the factors used to trigger alternative compensation measures and/or adaptive management measures;*
- e) *details of the artificial nesting site maintenance schedule; and*
- f) *provision for annual reporting to the SoS, to include details of the number of birds colonising the site including: evidence of birds prospecting; nesting attempts; egg laying; hatching; and fledging, to identify barriers to breeding success and target alternative or adaptive management measures.*

The intention is to deliver the compensation for East Anglia TWO, East Anglia ONE North and the Norfolk Projects together at a single location; however, separate KIMPs have been prepared for each of these projects to discharge the relevant conditions of the compensation schedules for their respective DCOs.

¹ The kittiwake compensation plan is Appendix 1 of the Offshore Ornithology Without Prejudice Document. This document was submitted as part of the Projects application and can be found here <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010078/EN010078-009881-ExA.AS-6.SoSQ2.V5%20EA2%20Offshore%20Ornithology%20Without%20Prejudice%20Compensation%20Measures.pdf>

1.2. Strategic Approach to Compensation

The Norfolk Projects are also required to deliver kittiwake compensation associated with the FFC SPA. Vattenfall and ScottishPower Renewables have entered into a co-operation agreement and are working collaboratively to deliver a combined solution to meet the kittiwake compensation requirements for their respective projects. Due to the requirement for a greater level of compensation by Vattenfall they have taken a secretarial lead role in the consultation and development of the compensation measures. ScottishPower Renewables have prepared this KIMP in line with the approach developed by Vattenfall. Further details on consultation are provided in Section 1.3 and details of the development of the plan are provided in Section 1.4.

1.3. Consultation

Under the Norfolk Projects and East Anglia ONE North and TWO consents, there is a requirement to set up a Kittiwake Compensation Steering Group (KCSG) to discuss and agree the KIMPs for each project. A KCSG was set up by Vattenfall in which details of the Norfolk Projects KIMP were discussed; ScottishPower Renewables representatives for East Anglia ONE North and TWO were in attendance for the third and fourth KCSG meetings (11th August 2022 and 6th October 2022). KCSG meetings five and six have also taken place on 21st November 2022 and 29th September 2023, which mainly dealt with the proposals for and results of monitoring and proposal for adaptive management. It is important to note that the KCSG agreed that any discussions and subsequent agreements on compensation that were made at the Norfolk Projects meetings are applicable for East Anglia ONE North and TWO. This is as per agreements made during meeting three, on 11th August 2022. Details of this are provided in the Agreement Log. Confirmation of this agreement is also provided in the ScottishPower Renewables Plan of Work (EA1N-GEN-ENV-PLN-IBR-000001) which was approved by the Department for Business, Energy and Industrial Strategy (BEIS)² on 16th January 2023.

1.3.1. KCSG Members

The KCSG is comprised of representatives of East Anglia ONE North and TWO (ScottishPower Renewables), the Norfolk Projects (Vattenfall), Natural England (NE), the Marine Management Organisation (MMO), East Suffolk Council, Great Yarmouth Borough Council and the Royal Society for the Protection of Birds (RSPB).

The KCSG meetings are chaired by an independent chair Eurona Consultancy Ltd.

1.3.2. East Anglia ONE North and TWO Consultation

Consultation for East Anglia TWO is being held jointly with East Anglia ONE North. For ScottishPower Renewables to wholly discharge their conditions, an East Anglia ONE North and TWO Project specific KCSG has been established (including the same members of the Norfolk Projects' KCSG). Terms of reference, as agreed with the East Anglia ONE North and TWO KCSG members, are detailed in the Kittiwake Steering Group Plan of Work (PoW, EA1N-GEN-ENV-PLN-IBR-000001, submitted on 12th December 2022), as approved by BEIS (16th January 2023).

ScottishPower Renewables has consulted the KCSG to allow members to review and comment on the East Anglia TWO KIMP and supporting documents prior to formal submission to the SoS. The compensation measures set out in this KIMP to meet the requirements of the East Anglia TWO DCO were discussed at meeting seven of the KCSG on 29th January 2024. The key points of discussion and agreement are detailed in the Agreement Log.

ScottishPower Renewables have utilised the Agreement Log as prepared by Vattenfall and have updated it with the comments received specifically as part of East Anglia ONE North and TWO consultation (Annex 1).

1.4. Document Development

The East Anglia TWO KIMP has been prepared with reference to the final iteration of the Norfolk Projects KIMP (PB5640.009.0004 Version 4) which was approved by the SoS on 26th January 2023.

Prior to preparation and submission of this KIMP for East Anglia TWO, a single KIMP was drafted to discharge the relevant conditions of the compensation schedules for their respective DCOs. Version one of the East Anglia ONE North and TWO KIMP was issued to the KCSG for review on 18th April 2023; following some minor

² In February 2023, this function of BEIS was replaced by the Department for Energy Security and Net Zero (DESNZ).

amendments, Version two of the East Anglia ONE North and TWO KIMP was formally issued to the SoS for approval on 12th June 2023.

Versions one and two of the East Anglia ONE North and TWO KIMP included provision for 15 nest spaces as compensation for the impacts of both Projects; the number of nest spaces was calculated using methodology as agreed in the Norfolk Projects KIMP. These 15 nest spaces are provided for in the three nesting structures that were installed at Port of Lowestoft to provide joint compensation for the Norfolk Projects and East Anglia ONE North and TWO. The three nesting structures were installed in February 2023.

Following submission to the SoS, the Department for Energy Security and Net Zero (DESNZ) subsequently issued a decision letter³ on 10th November 2023 stating that: *“The Orders require the KIMP to be based on the Without Prejudice Compensation Plan which has a proposed target of 100 breeding pairs, and this is supported by calculations for the 100 figure as a threshold for compensation. The calculations used by the Applicant to get to the KIMP Approval Request of 15 nest spaces and those used in Norfolk Vanguard Offshore Wind Farm Order 2022 and Norfolk Boreas Offshore Wind Farm Order 2022, are different to those used in the Without Prejudice Compensation Plan. The 100 breeding pairs is the required compensation and consequently the Applicant’s proposed 15 nest spaces in its KIMP does not provide sufficient nest spaces to meet the requirements of paragraph 3 of Part 1 of Schedule 18 to the Orders. The Secretary of State therefore does not approve the Kittiwake Implementation and Monitoring Plan as currently proposed.”*

DESNZ clarified that the total compensation requirement was for 100 breeding pairs for both East Anglia ONE North and TWO projects combined and that these were expected to be split proportionally between the projects according to the scale of impact of each project.

Following this consultation, ScottishPower Renewables have revised their approach to provide separate KIMPs for East Anglia ONE North and East Anglia TWO, to account for the different timescales of the Projects and different timescales and availability of the compensation measures for each Project. Compensation measures required for East Anglia TWO are already entirely provided for within the three existing nesting structures at the Port of Lowestoft, whereas the compensation measures for East Anglia ONE North will in part be delivered by the existing nesting structure and in part will require the provision of additional nest spaces.

Versions one and two of this East Anglia TWO KIMP were submitted for review to the East Anglia ONE North and TWO KCSG. Version three of this East Anglia TWO KIMP is submitted to the SoS for approval.

³ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010078/EN010078-010106-Decision%20Letter.pdf>

1.5. Document Structure

Summarised below is the document structure of this KIMP.

Section	Title	Detail
1	Introduction	Section introduces the projects, the purpose of the KIMP including consent requirements and progress to date.
2	Summary of Proposed Compensation Measures	Outlines the proposed compensation measures.
3	Location of Compensation Measures	Details the area that the kittiwake nesting structure has been constructed and why this location was considered.
4	Details of Landowner Agreement	Outlines the option agreement for lease.
5	Artificial Nest Structure Design	Describes the nest structure and the technical justification to support it.
6	Delivery Timetable	Outlines the programme for construction and implementation of compensation.
7	Maintenance Schedule	Details the maintenance plan of the nesting structure post construction.
8	Artificial nest site, nest dispersal and colony interchange monitoring report	Outlines the ongoing monitoring and reporting aims.
9	Compensation performance and monitoring management	Discusses the need for annual reporting and describes how the success of the compensation delivery is measured, as well as adaptive methods.
10	References	Sources used to inform the development of this KIMP.

1.5.1. The Final Submission Structure

Version three of the East Anglia TWO KIMP for submission to the SoS includes the following Annexes:

- Annex 1: Agreement Log – Reflects the topics of discussion between members of the KCSG for East Anglia ONE North and TWO and the Norfolk Projects. The Agreement Log outlines topic specific matters agreed, not agreed and any actions to resolve areas of disagreement. This has been provided to the KCSG for review prior to formal submission to the SoS.
- Minutes of meeting seven of the KCSG on 29th January 2024 relating to the revised KIMPs for East Anglia ONE North and East Anglia TWO.

Note, the Norfolk Projects also submitted the following Annexes alongside their KIMP which are applicable to the submission of the East Anglia TWO KIMP. These Annexes can be accessed via the Planning Inspectorate (PINS) website; hyperlinks have been provided below in the footnotes.

- Annex 1: Consultation Report: Summary of the consultation undertaken prior to submission of the Norfolk Projects KIMP for the Norfolk Projects and East Anglia ONE North and TWO. It details the KCSG attendees, minutes, dates and other meeting information. The Consultation Report includes the following information, where relevant:
 - Signed invitation letters from KCSG members, which outlines the agreement of participation.

- Agreement Log – Reflects the topics of discussion between members of the KCSG for the Norfolk Projects, East Anglia ONE North and TWO. The Agreement Log outlines topic specific matters agreed, not agreed and any actions to resolve areas of disagreement.
- Email confirmation from members that the Agreement Log is an accurate representation of members' positions.
- Minutes from the KCSG meetings, up to meeting four.
- Annex 2: Kittiwake Structure Concept Design Report: Overview of initial design concepts of the compensation structures⁴.
- Annex 3: Kittiwake Nesting Success on Artificial Structures: Report investigating the nesting success of kittiwake on artificial structures and evaluates the method as a viable compensation tactic. The report provided recommendations which have been considered when designing the nesting structure⁵.
- Annex 4: Structure Design Detailed Report: Details the specific parameters of the kittiwake nesting structure design and the initially considered nesting tower design (such as the width of each nesting box)⁶.
- Annex 5: Kittiwake Structure Final Detailed Drawings: Details the final agreed design plans and detailed drawings of the artificial nesting structures⁷.

2. SUMMARY OF PROPOSED COMPENSATION MEASURES

The general approach to compensation was set out in the Offshore Ornithology Without Prejudice Compensation Measures document for East Anglia TWO¹. This confirmed that the provision of artificial nesting structures would be the most effective means of compensating for in-combination effects on kittiwake populations. The approach would enable improved productivity for the North Sea kittiwake population from which recruits to the FFC SPA population are drawn.

Following the East Anglia TWO Examination, concept designs for two options were developed: a wall structure and a tower structure. These options drew inspiration and learning from other artificial nesting structures which have been previously successful; including an artificial tower built on the Tyne and the wall structure which was built at the entrance to Lowestoft harbour. These are summarised in the Concept Design Report⁴.

A study was subsequently undertaken by MacArthur Green (2021) to examine existing use of artificial structures by kittiwakes in the UK (at Dunbar, along the Tyne and in Lowestoft) to ascertain the features of artificial sites associated with higher breeding success. This is summarised in the Kittiwake Nesting Success on Artificial Structures Report⁵. The results of this study fed into design revisions for the nesting structures and, following extensive consultation with the KCSG, the designs were developed and are discussed in the Detailed Design Report⁶, with final designs agreed by all KCSG members which can be found in the Final Design Drawings⁷.

The nesting structure is a modular design, enabling individual units to be removed for modification or repair as necessary. Details of the size of each section (and number of nests allowed for) of the wall are provided in Section 5.

Installation of three nesting structures with a capacity of 432 nest spaces was completed in February 2023. Therefore, those nest spaces have been available to kittiwakes for one whole nesting season (March to September) in 2023.

⁴ https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-003008-The%20Norfolk%20Projects%20KIMP%20Annex%202%20Kittiwake%20Structure%20Concept%20Design%20Report%20document_.pdf

⁵ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-003009-The%20Norfolk%20Projects%20KIMP%20Annex%203%20Kittiwake%20Nesting%20Success%20on%20Artificial%20Structures%20document.pdf>

⁶ https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-003010-The%20Norfolk%20Projects%20KIMP%20Annex%204%20Kittiwake%20Structure%20Detailed%20design%20report%20document_.pdf

⁷ <https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010087/EN010087-003011-The%20Norfolk%20Projects%20KIMP%20Annex%205%20Kittiwake%20Structure%20Final%20Detailed%20Drawings%20document.pdf>

Further to the clarification provided by DESNZ, the compensation requirement is for East Anglia ONE North and TWO to provide artificial nesting structures of sufficient size to support 100 breeding pairs as compensation, split proportionally between East Anglia ONE North and East Anglia TWO according to the scale of impact at each. The requirement for East Anglia TWO is entirely provided for within the three nesting structures installed in February 2023.

3. LOCATION OF COMPENSATION MEASURES

A number of potential locations for the artificial nesting structure have been considered and discussed in detail with the KCSG. However, the location taken forward is at Lowestoft Port, with a location on the outer port wall near the existing kittiwake nest wall (Figure 1).

An agreement with the landowner has been entered into as set out in Section 4 and planning permission has also been granted for the three existing structures as described below.

Lowestoft Port is considered to be the most suitable location, largely due to its proximity to the sea and accessibility for construction and monitoring purposes. Lowestoft was also considered preferable in large part due to the existing presence of breeding kittiwake in the port and the town. This is expected to result in rapid colonisation of any new nesting structures in Lowestoft. Furthermore, the Lowestoft Port location is adjacent to a wall that was built for kittiwake nesting in the 1990s, but which was abandoned due to high levels of predation by large gulls and foxes (lessons regarding the design of this site and why it failed to provide a long-term nesting site have been included in the current designs). Kittiwake still nest at various locations around the port (see Nesting Success on Artificial Structures Report⁵) and therefore there is clear precedent that the site is suitable.

Planning permission under the Town and Country Planning Act 1990 for the installation and maintenance of the three existing kittiwake nesting structures at the selected location at the port of Lowestoft was granted on 4 October 2022 (planning reference DC/22/3202/FUL). The application was not considered to constitute an 'EIA development' under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) or the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (hereafter referred to as the EIA Regulations) (planning reference DC/22/1347/EIA). The Planning Application and planning decision can be found on the East Suffolk Council website⁸.

4. DETAILS OF LANDOWNER AGREEMENT

ScottishPower Renewables have entered into an agreement for the lease of the site at the Port of Lowestoft with regards to East Anglia ONE North and East Anglia TWO (see Figure 1 for the lease area). The land comprises land registered at HM Land Registry with title absolute under title number SK272783, namely Land at Northern Pier Head comprising 1011.71sqm (0.25 acres) (Property).

The Permitted Use under the current lease is for the construction, erection, maintenance and use of a structure to accommodate up to 450 kittiwake nests. The lease grants ScottishPower Renewables the right to undertake works for the installation, erection and use, and removal of the Kittiwake Compensation Measures, as well as fencing, monitoring and surveillance equipment and any ancillary communications infrastructure. Kittiwake Compensation Measures is defined as the provision of kittiwake nesting structures on the Property suitable for up to 450 nests (in combination with the Norfolk Projects).

ScottishPower Renewables are also granted the right to pass to and from the Property over the roads, designated by the landlord, provided at the Port for dock purposes.

Additionally, ScottishPower Renewables are granted the rights to connect to and use the conduits serving the Property and to lay, install, use, maintain, repair, replace, inspect, upgrade, make connections to decommission and remove conduits for the supply of electricity and telecommunications services to and from the Property in approved locations. The lease also grants ScottishPower Renewables the right to park two motor vehicles in spaces designated by the Landlord for visitors to the Port.

Lastly, ScottishPower Renewables are granted the right to use an agreed part of the Port during construction of the Kittiwake Compensation Measures as a temporary works compound.

⁸ <https://publicaccess.eastsuffolk.gov.uk/online-applications>

5. ARTIFICIAL NEST STRUCTURE DESIGN

5.1. Scale of Compensation

Collision Risk Modelling (CRM) undertaken for the East Anglia TWO DCO application predicted the annual loss of 0.8 kittiwakes. In the Habitats Regulations Assessment (HRA) for East Anglia TWO the SoS stated:

“The SoS considers that sufficient information has been provided to give confidence that necessary compensatory measures can be secured that will ensure the overall coherence of the National Site Network for kittiwake. The SoS notes that the Applicant’s proposed compensation package, which includes the provision of artificial nesting structures at Lowestoft and/ or River Tyne, would sit within the second tier of Defra’s hierarchy of compensation measures for the marine environment, i.e., it would address the “same ecological function at a different location” and provide “off-site creation, restoration or relocation of feature that will be harmed/lost”. The SoS also agrees that the recruitment of 0.7 and 0.8 (for East Anglia ONE North and East Anglia TWO, respectively) adult kittiwake into the southern north sea (SNS) population per year would compensate for the effects of the Project.”

To calculate the size of artificial structure required to meet these requirements several factors have been taken into account, which were set out in the kittiwake compensation plan in Appendix 1 of the Offshore Ornithology Without Prejudice Document¹. A summary of the calculations provided in the kittiwake compensation plan is shown in Table 1. The target number of breeding pairs was estimated using:

- An assumed survival of 50% chicks to adulthood;
- Rounded up impact value of two collision losses at East Anglia TWO based on 95% upper confidence interval values of 1.4 collisions per year;
- A compensation colony productivity rate of at least 1.0 chick per nest (a precautionary value in the context of productivity between 0.96 and 1.2 at other colonies at Lowestoft, River Tyne artificial sites and Dunbar (castle and harbour); see e.g. Carter 2014, MacArthur Green 2021));
- A productivity rate of 0.8 to maintain a stable population (Coulson 2017), leaving a difference of 0.2 chicks per nest available to recruit elsewhere (e.g. FFC)); and
- An overall 3:1 ratio for additional kittiwake capacity, following the approach applied for habitat compensation (as highlighted by NE).

Table 1: Number of kittiwake nests required to compensate for East Anglia TWO (note that the three nesting structures installed at Lowestoft Port prior in February 2023 have the potential to accommodate up to 432 nest spaces)

Site	Predicted kittiwake loss due to collision (mean, 95% UCI, rounded value)	No. chicks required to achieve necessary adults (assuming 50% survive to adults) (mean, 95% UCI, rounded value)	Allowance that 0.2 chicks per nest are available to recruit elsewhere (mean, 95% UCI, rounded value)	3:1 ratio (required nest spaces) (mean, 95% UCI, rounded value)
East Anglia TWO	0.8, 1.4, 2.0	1.6, 2.8, 4.0	8, 14, 20	24, 42, 60

The calculations above summarise the provisions set out in the East Anglia TWO compensation plan, which differs from and is more precautionary than those used to derive the number of compensation nest spaces described in the Norfolk Projects KIMP. DESNZ have since clarified that the combined compensation requirement is for the provision of artificial nesting structures of sufficient size to support 100 breeding pairs for both East Anglia ONE North and TWO projects combined, with this value split proportionally between the two projects according to the ratio of the magnitude of impact at each project. The proportion assigned to East Anglia TWO is therefore 52 breeding pairs (1.3:1.4 ratio for East Anglia ONE North: East Anglia TWO). This KIMP proposes 60 nest spaces for East Anglia TWO, aligning with the requirements as set out in the compensation plan and exceeding the requirements advised in the DESNZ decision letter of 10th November 2023.

The proposed compensation measures are of a highly precautionary scale such that there is confidence that successful colonisation of the structures will deliver the required compensation. Considering the ratio of

number of predicted collisions to compensatory nest spaces, East Anglia TWO has the highest ratio compared with other recent offshore wind farm applications (Table 2), noting the simplistic nature of this comparison under the assumption that demographic parameters are equal.

Table 2: Comparison of the ratio of scale of impact to compensatory kittiwake nest spaces provided for East Anglia TWO, the Norfolk Projects and Hornsea Three

Site	Predicted kittiwake loss to be compensated	Number of compensatory nest spaces	Ratio (impact: compensation)
East Anglia TWO	0.8	60	1:75
Norfolk Projects	35	360	1:10
Hornsea Three	73	1,868	1:26

The existing compensation structures installed in 2023 have the potential to accommodate up to 432 nest spaces (Section 2), 360 of which are required to provide compensation for the Norfolk Projects. There are therefore 72 nest spaces remaining, 60 of which can be assigned to East Anglia TWO. Considering this alongside the requirements set out in the Norfolk Projects KIMP, it is concluded that the proposed compensation measure, comprising the three existing nesting structures at Port of Lowestoft is sufficient to close out the relevant requirements for East Anglia TWO, as outlined in the above SoS statement.

5.2. Evolution of the Nesting Structure Design

Prior to the first KCSG meeting, Vattenfall engaged with Royal Haskoning DHV to develop initial designs for artificial nesting structures for kittiwake. The basis for these “concept designs” drew inspiration from existing successful structures including a bespoke tower located at Gateshead and the Lowestoft harbour kittiwake wall structure (which was initially successful, but subsequently failed due to predation). Two options were developed, a tower structure and a wall structure. The tower structure has three sides like the successful Gateshead tower and thereby permits nesting on ledges with different aspects. The wall structure was designed with a modular concept so that the length could be readily adjusted to suit the requirements of any particular deployment location. Annex 2 presents the concept designs⁴.

In parallel with the concept design work, MacArthur Green were commissioned to undertake a study of kittiwakes nesting on artificial structures to determine which parameters resulted in success. The study, which is provided in Annex 3, concluded that the following characteristics should be provided for an artificial kittiwake nesting feature:

- Nesting ledges that are between 80 and 150 mm wide, and no more than 200 mm wide.
- Several rows of ledges, designed to reduce risk that birds nesting on lower ledges will be fouled by excrement from ledges above; e.g. by having a stepped structure with the lower ledges recessed relative to the ledges above, or a back wall angled outwards at few degrees from the vertical.
- Sheltered from waves or sea spray during storms.
- Direct access for the birds to the sea would be desirable, but not essential.
- Close to existing colonies if possible, as this would be likely to result in faster colonisation.
- Shelter from direct sun, by selecting north, north-east or north-west-facing sites for artificial ledges, or by providing a large overhanging roof.
- Shelter from crow and large gull access by providing a large overhanging roof, but is also inherent in narrow ledges.
- Shelter from rain, e.g. by providing a large overhanging roof.
- Constructed to minimise risk of predator access (i.e. fox, mink or rat).
- Construction material may be stone, brick, concrete, timber or tyres. Metal may also be suitable, providing the site is sheltered from direct sun to avoid overheating.
- Ledges can be continuous without breaks, but kittiwakes often select nest sites against a side wall, so having stops built into ledges every c. 1.5 m is desirable and may provide additional predator protection.

- Kittiwakes are highly tolerant of human activity and noise around their nests, so sites do not need to be away from human activity and could be compatible with industrial activity. However, noise and mess made by kittiwakes means that sites away from human residential, commercial or business areas would be preferable.
- A spacing allowance of 50cm between nests.

The findings from the MacArthur Green study as well as feedback from the KCSG on the concept design report were used as the basis of design for the detailed design stage (see Annex 4). At this point the designs moved to a “cabinet” based design whereby the nesting ledges were encased in a cabinet (Figure 2). This approach has several advantages. Firstly, it allows for easy removal or replacement of sections of ledges in isolation from the rest of the structure, secondly it increases the amount of stops or book-ends which the MacArthur green report recommended, and thirdly, it increases the modularity of the structures which allows for scaling up or down if required. Another significant change in the detailed design was the tapering of ledges to prevent fouling of nests on lower ledges from those above. Starting at the top of a cabinet with a top ledge width of 200mm the ledges gradually decrease in width to 100mm which accords with the recommendations provided by MacArthur Green.

Through discussions with KCSG members concerns were identified with how the nests would be accessed for monitoring purposes without disturbing the nesting birds, these concerns were addressed for both wall and tower structures by decreasing the size of access doors in the rear of the cabinets so that only two ledges would be accessed from each door. Further discussions on this topic raised concerns that if conducted during windy conditions opening the doors in the back of the wall structure for monitoring could result in the nests being blown off the ledge. These discussions resulted in a structure being added to the rear of the wall to allow sheltered access as shown in Figure 2. Table 3 provides a summary of all the design modifications that were made following consultation with the KCSG.

The detailed designs were presented at the second KCSG meeting, and these were agreed in principle pending further information to be provided on site layout (see Section 5.3 for further detail) and a more thorough review of the detailed design report following the meeting.

Prior to the third KCSG meeting comments were provided on the detailed design which included concerns regarding the fact that on the tower design a central ledge existed between the upper and lower cabinets which could be accessed by predatory gulls, and the fact that predatory gulls could nest on top of the wall structures. During the third KCSG meeting possible solutions to both of these issues were discussed and it was agreed that modifications would be made to the cabinets of the tower structure (see Table 3, and the minutes from the third KCSG meeting included in Appendix 4 for the KCSG Consultation Report which forms Annex 1 of this KIMP), however the concerns around gulls nesting on the roof structure were allayed through discussion by ornithology experts within the group and therefore this did not result in a change to the designs.

Also, at the third KCSG meeting discussions around the sustainability of the structures and materials used resulted in a redesign of the wall to reduce the amount of concrete within the structure and replace it with steel. With the commitment to make these changes, the designs were agreed by the KCSG and these final agreed designs are provided in Annex 5.

It was agreed with the KCSG at the third meeting that the preferred design to take forward at the Lowestoft location was the wall structure. The final wall structure presented in Figure 2 includes a number of design characteristics which have been developed to improve the chances of success:

- Modular design – to allow for scalability of nesting ledge space.
- Cabinet design of ledges allowing for easy replacement of sections if failure occurs, or modification is required.
- Safe and low disturbance access to nests for monitoring.
- Numerous “book ends” as this appears to be a preference for kittiwakes.
- Multiple predator deterrents from aerial and ground threats.
- Security from trespassers (both structures can be locked).
- Sheltered – including tapering ledges.
- Constructed from materials which are not prone to overheating and are of a lower Carbon footprint.

In addition, the kittiwake wall structure has the following design features:

- The nesting ledges can be accessed from the rear to allow birds to be caught and fitted with leg rings. Ledge access is via individual small hatches, and these are protected within a secure covered building to the rear, which will minimise disturbance.
- A modular design, with each unit approximately 2.5m long, allowing the structure to be scaled to suit the space available at a deployment location.

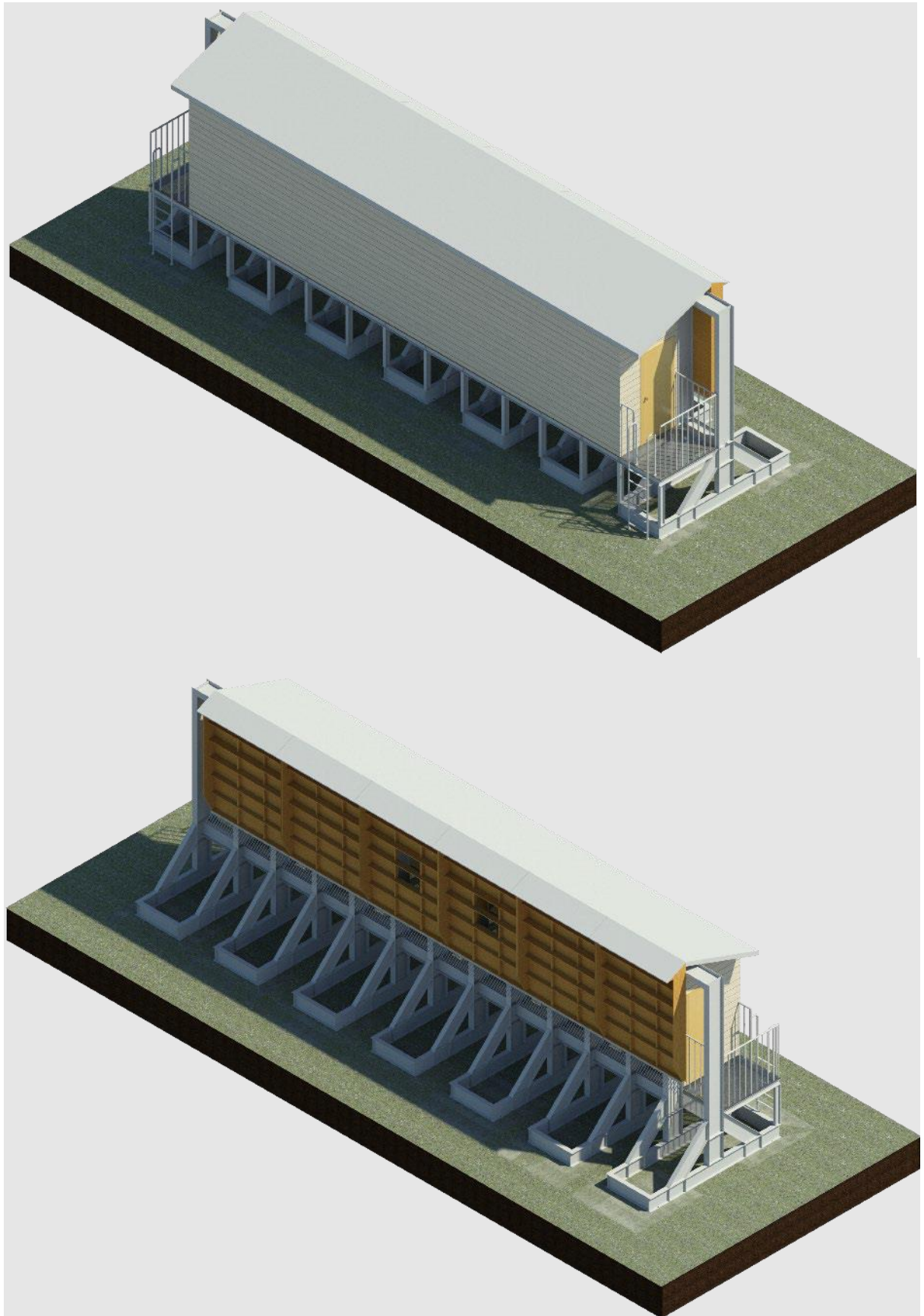


Figure 2: Final wall design (top image is front view, bottom image is rear view)

As discussed above significant collaboration between the KCSG members informed and refined the design of both structures and a summary of this input and the resultant modifications is provided below.

Table 3: Design modifications informed by the KCSG

Comment	Design solution
Wall structure	
The concept designs especially for the wall structure would lead to some disturbance to the nests when hatches are opened for monitoring purposes.	The size of the hatches was reduced and the number increased so that only two ledges are serviced by each hatch.
The concept wall design included a mobile scaffolding structure. Concerns were raised that kittiwakes or gulls may try to nest on this structure.	An enclosed sheltered area was added to the rear of the wall structure design. This had the added advantage of removing the concerns regarding disturbance (see line above) especially in windy conditions.
Ledges should be narrow, experience from birds nesting in Lowestoft show that there is a preference for ledges less than 200 mm and as small as 100 mm (birds have been known to nest on narrow window ledges).	This information concurred with the findings of the nesting study and resulted in ledges tapering from 200mm at the top to 100mm at the bottom.
Mess from nests on higher ledges could foul nests on lower ledges, this should be prevented if possible.	
Site layout and fence design	
Images of the fence surrounding the structures presented at the KCSG meeting indicated that the overhang might trap birds as they try to access the structures.	Following consultation with possible suppliers a fence design has been developed which accords with the RSPB guidance on fence design (White & Hirons 2019). Key considerations will be avoidance of barbed wire and use of an appropriate mesh size to avoid the risk of entrapment. Height will be sufficient, in combination with the overhang, to prevent fox access.
Concerns were raised regarding how birds would access the structures within the proposed site locations. This was of particular concern with the wall structures at Lowestoft and less of concern with the tower structures as they have a much smaller footprint.	Three- dimensional models were created to demonstrate distances between the wall structures and other structures surrounding the site location at Lowestoft. The site layout was also designed to provide maximum space between the wall structures whilst remaining within the lease area proposed by the port.

The final agreed detailed design drawings are presented in Annex 5. Other suggestions were made, and possible solutions investigated but not taken forward to the final designs; for example, NE raised concerns about predatory gulls nesting on the roof of the wall structure. The design team suggested adding an Apex roof with sloping sides and this solution was presented at KCSG meeting 3. Following further discussions, it was agreed that this modification was not required because, as the RSPB noted, kittiwakes coexist with predatory gulls in Lowestoft (and indeed more widely), and this does not appear to affect the productivity of the kittiwakes. The Apex solution, therefore, does not form part of the compensation measures, but could be used as an adaptive management measure in future if required (see Section 9).

In summary, two designs were developed in order to ensure flexibility in advance of finalising the location, since different sites would be expected to be more or less suitable for either the wall or tower option. However, the preferred design to take forward at the Lowestoft location is the wall structure.

5.3. Site Layout

5.3.1. Port of Lowestoft

Although the landowner at the port of Lowestoft, the Association of British Ports (ABP), offered a number of potential locations, the most favourable option was on the outer side of the North pier (Figure 3). This location has the best access to open sea and is in a relatively quiet part of the port protected from outside influence by an existing 4m high wall (Figure 4). It should be noted that the area adjacent to this site, on the other side of the 4m wall, is intended to be developed by the Port as part of the Lowestoft Eastern Energy Facility (LEEF) programme.

The plans show that there are to be no works to the section of the North Pier on which the compensation site is located, nor are there any plans for works to the remainder of the North Pier structure. Construction of offices is proposed, however these are well to the north of the compensation site. To the east of the compensation site, the construction of a bund is proposed, which will require some piling and new access roads are proposed. However, for the following two reasons these activities are not expected to be detrimental to kittiwake colonisation and breeding on the nesting structures. Firstly, the 4m wall is to be retained and this will provide a barrier to noise and visual disturbance. Secondly, kittiwakes are extremely tolerant of human activity and already nest on numerous buildings and structures throughout the port and Lowestoft town, in close proximity to machinery, vessels, vehicles (including on window ledges along main roads with double-decker bus routes) and people, with no evidence of disturbance.

It was agreed that the wall structure would be the best design to deploy at this location. The main reasons for this are that it would be almost completely screened from view by the existing 4m high wall which would remove any landscape impacts and the fact that a similar kittiwake nesting structure located at the end of the ports' North pier had previously been successful (although it has since fallen out of use, thought to be due to predation and the lack of maintenance).

Once it was determined that a wall structure was most appropriate, optioneering work was undertaken to settle on the best layout. The options considered before arriving at the final agreed layout are as follows:

- Option 1
 - A single wall parallel to the existing 4m high port wall was considered however this would result in ledges either facing south-southeast or north-northeast. Nests located on the southern side could overheat whilst ledges on the northern side would have less direct access to the sea, as it would be facing directly towards the existing 4m high wall. Therefore, that option was ruled out.
- Option 2
 - Multiple separate wall structures were then considered as the modular design allows for this level of flexibility. Multiple structures also allow more ledge space for nests to fit into a smaller footprint.
 - In order to maximise length of walls that could fit into the space offered by the landowner they would need to be rotated away from parallel to the existing wall.
 - If they were rotated further north, the access to the sea would be less immediate. Should they be rotated further to the east there would be a risk of overheating during the morning. In addition to this the eastern end of each wall would then be located too close to the edge of the quay and the risk of structural harm to the existing concrete base could occur during the installation.
 - With the orientation chosen the ledges could be placed on the southern side of wall, however that would risk overheating, therefore the northeast orientation was considered the most optimum.
 - It would be possible to orientate the three towers north to south (i.e., a mirror image of what is presented) however that would result in exposure to sun until midday.

The orientation of the three structures is presented in Figure 5.

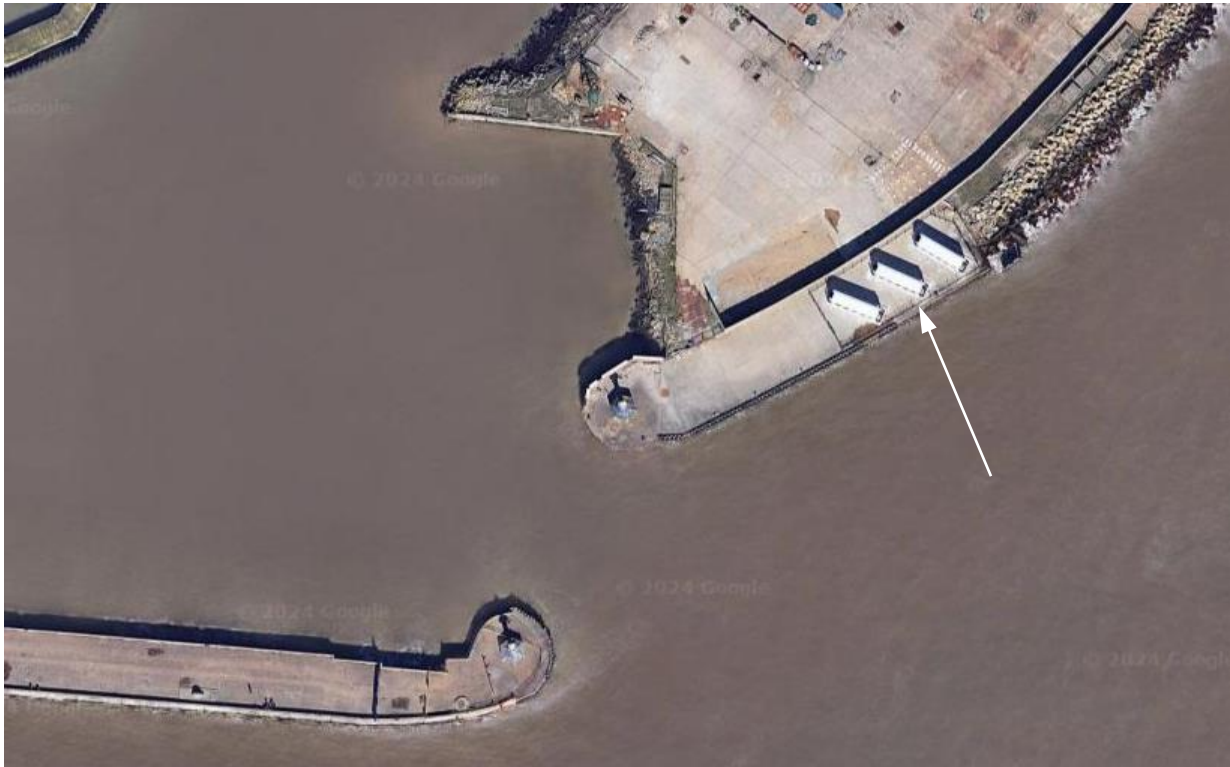


Figure 3: Location of the kittiwake wall structures at the Port of Lowestoft



Figure 4: Photo of the three wall structures as constructed at the Port of Lowestoft (February 2023)



Figure 5: Site layout of kittiwake wall structures at the port of Lowestoft

During discussions about the proposed site layout at the second KCSG meeting concerns were raised about whether the kittiwakes would be able to access the structures by navigating around and between the walls and other existing structures in the vicinity. To facilitate these discussions a three-dimensional model was created of the proposed site layout. This showed the three structures proposed at the time with a separation distance between the structures of at least 7.5m at the closest point above ground level. On consideration of this additional information the KCSG agreed that the spacing was suitable.

5.4. Fence Design

It has been agreed by the KCSG that a predator proof fence should be used to enclose the kittiwake nesting structures in order to prevent access by mammalian predators (e.g., fox) and thereby maximise reproductive success. The fence is also likely to reduce human disturbance to the nesting birds, although neither port site has public access so this risk should be minimal. The installed fence layout that encompasses the three structures is illustrated in Figure 5. The specification of the fence adheres to the guidance provided in the RSPB manual on the Predator Exclusion Fence design (White & Hirons 2019):

- Has a height of 1.8m;
- Has a mesh size of 5 x 10cm;
- Is topped with a 45° angled overhang c. 60cm (smooth material or floppy mesh) to the outside;
- Has a narrow skirt pinned at the base to the existing concrete using tamper proof bolts;
- Has a wire with minimum gauge of 1mm;
- Has a design life of at least 35 years (with regular maintenance) and will be maintained or replaced as necessary for the duration of the compensation; and
- Has been constructed with particular care to ensure that potential weak points (corners and gates) are well installed with minimal gaps.

6. DELIVERY TIMETABLE

Schedule 18, Part 1, Paragraph 5 of the East Anglia TWO DCO states that:

“no operation of any turbine forming part of the authorised development may begin until four full breeding seasons following the implementation of the measures set out in the KIMP have elapsed. For the purposes of this paragraph each breeding season is assumed to have commenced on 1 March in each year and ended on 30 September”.

Commissioning of the three kittiwake structures was completed in February 2023, prior to the start of the breeding season (defined as 1 March to 30 September) in 2023. Considering the 432 nest spaces already provided and allowing for 360 nest spaces required to provide compensation for the Norfolk Projects, 72 nest spaces will have been provided, 60 of which are assigned to East Anglia TWO, for four years prior to the first operation of any turbine within the East Anglia TWO development (scheduled after September 2026). **Therefore East Anglia TWO is compliant with the requirements of the East Anglia TWO Order, Schedule 18, Part 1, Paragraph 5.**

7. MAINTENANCE SCHEDULE

It will be important that the nest structure is maintained in a sound state so that it continues to provide a safe and effective structure for kittiwake breeding. To ensure this there will be regular inspections by a qualified engineer and ornithologist to ensure the needs of the birds are met and that the structure is safe for ornithologists engaged in monitoring studies. These inspections will primarily be conducted during the nonbreeding season in order to avoid unnecessary disturbance (kittiwakes are only in attendance at their nesting sites from late February to August).

An initial inspection will be conducted in September each year to identify any works required and to schedule these in at appropriate times. As well as a post-breeding inspection to allow any major works to be undertaken in advance of the following season, remote inspection (e.g. using binoculars) will also be performed during the breeding season in case any emergency repairs are required. There will also be a pre-season check conducted in January to ensure the site is in good condition immediately prior to bird arrivals. This will be conducted to allow sufficient time for all necessary repairs to be completed. It may also be necessary to undertake checks following severe weather.

Pre-breeding season inspections will also ensure that the nest access doors and panels are all operational.

Repair work during the breeding season will only be conducted if it is considered essential due to the high degree of disturbance this would cause, and the risk of egg and chick loss to predatory gulls. Due to the modular nature of the structures repair work can be isolated to small sections of the structures.

Due to the ongoing (since 2022) outbreak of highly pathogenic avian influenza (HPAI) in the UK it may also be appropriate to attempt to disinfect the nesting ledges between breeding seasons. Should this be considered necessary, and it can be undertaken without acting against the aims of the compensation (for example nest removal over winter may reduce the likelihood of pairs from returning in the following breeding season) then statutory advice and guidance on such matters would be followed.

Similarly, it may be necessary to remove the carcasses of kittiwakes suspected of dying from HPAI. This will be undertaken following the statutory guidance on safe removal.

8. ARTIFICIAL NEST SITE, NATE DISPERSAL AND COLONY INTERCHANGE MONITORING AND REPORTING

8.1. Overview

The following section describes the details of the monitoring proposal for the kittiwake compensation as agreed via the KCSG. Whilst a collaborative approach between Vattenfall and ScottishPower Renewables is being pursued, it is important to be cognisant of the fact that East Anglia ONE North, East Anglia TWO and the Norfolk Projects are independent commercial entities and have their own individual consents. Therefore, in the very unlikely event that a collaborative approach cannot be delivered (and noting that there is no indication of such an outcome at the time of writing), ScottishPower Renewables would seek to discuss a proportionate monitoring approach that suitably reflects the level of compensation East Anglia TWO is required to deliver.

8.2. Kittiwake Compensation Monitoring Approach

The kittiwake compensation has been developed with the aim of providing additional replacement breeding age birds into the southern North Sea population (from which birds at the FFC SPA are recruited), to replace the predicted potential loss of 0.8 adults per year from the FFC SPA population for East Anglia TWO. As it is not feasible to directly monitor all recruitment to the FFC SPA population (due to its large size and inaccessibility) it will be necessary instead to monitor other aspects of both the compensation population and other kittiwake populations in the region from which the performance of the compensation measures will be inferred. For the purposes of the monitoring 'regional' is defined as within 100km of the compensation population (this is the distance that most birds recruit within). This comprises, to the north the Norfolk coast as far as Scolt Head and to the south, all of the Suffolk coast and part of the Essex coast as far as Clacton-on-Sea.

A core monitoring approach (as outlined below) is the minimum monitoring requirements to track the performance of the compensation and will be undertaken in all years while the nesting structures remain commissioned (unless otherwise agreed with the KCSG and SoS). As such, monitoring and adaptive management will continue throughout the lifetime of the nesting structure. Additional monitoring is planned for the first three years after the nesting structures are commissioned (with the potential for extension) and will collect wider evidence to assist with understanding the performance of the population. Since the additional monitoring has been drawn up prior to the compensation commencing it should not be considered as exhaustive, since other studies may be identified as being more appropriate or informative, depending on observations of the colony. It should also be noted that methods which involve catching birds (e.g., for fitting leg rings) are expected to be subject to restrictions caused by the presence of HPAI in seabird populations, so may not be feasible at least initially.

The following will form the core monitoring, undertaken annually commencing in the first breeding season following installation of the structures:

- Counts of the number of pairs (apparently occupied nests (AON)) and productivity, backed up with photographs to enable the fate of individual nests to be tracked (remotely controlled cameras may also be installed to permit more intensive monitoring with minimal disturbance). In the first year of monitoring (2023), counts of AON, eggs and chicks were made every two weeks between March and August (10 counts in total). Following review of the results, and in discussion with the KCSG, this may be reduced (e.g. monthly).

- Chicks will be ringed with British Trust for Ornithology (BTO) and colour rings for the first 10 years of monitoring (2023-2032; with possible extension, subject to discussion with the KCSG), adults will be ringed with BTO and colour rings until year 5 of the monitoring (with possible extension, subject to discussion with the KCSG). In both cases the work will be undertaken by suitably trained, qualified and experienced seabird researchers, and only if there are no welfare or HPAI concerns.

In the first three years following initiation of the compensation the following additional monitoring will be undertaken (with possible extensions dependent on results obtained):

- Consideration of any relationships between nest position (on the structure(s)) and breeding success;
- Diet studies of compensation population, through collection of pellets and/or regurgitated material during handling of birds for ringing (note this aspect will be opportunistic and it is not proposed that efforts to force regurgitation will be made);
- Estimation of the regional population size (AON at accessible/visible locations within 100 km, focus will be onshore locations and efforts to survey offshore structures are not being proposed). Where possible counts will be made by visual observation and backed up with photographs to provide a permanent record and to facilitate comparisons across years (note this is expected to primarily comprise Lowestoft, however other areas along the East Anglian coast will be kept under review for monitoring should either surveys or contact with local bird groups etc. indicate the presence of breeding kittiwakes);
- Productivity of regional population (no. fledged/pair), derived from a sample of locations from the regional population since it is not considered feasible to monitor the entire regional population. This will be based on a minimum of three visits to the sample sites during the breeding season (May/June/July);
- Ring resighting campaigns. For adults this will be combined with the regional population counts and productivity sampling (above), with the aim of identifying any movement of adults from the compensation population to other urban and natural locations (i.e. to investigate if the new structure attracts recruits to the location which subsequently move into other urban locations where they may come into conflict with people). For juveniles this will focus on identifying recruitment locations for individuals hatched at the compensation colony, therefore the focus for this will commence four years after the first chicks are ringed. It is intended this will be coordinated with other kittiwake research, particularly at FFC SPA, and will include proportionate contributions from the East Anglia TWO to support existing ringing work of relevance to the compensation;
- Ringing (BTO and colour rings) of chicks produced at other regional populations may also be undertaken, at a sample of locations where such work is considered feasible. This may permit the origins of ringed birds which recruit to the compensation population to be determined; and
- Adult birds in the compensation population may be fitted with GPS tags to enable understanding of their breeding season foraging behaviour (distances, locations, etc.). However, this will only be conducted if it is considered to provide important data, due to the need to balance the knowledge gained with the welfare aspects associated with such studies.

It is hoped that much of the above monitoring will be conducted collaboratively by Vattenfall, with other interested parties, such as developers providing similar compensation, seabird researchers and other seabird interest groups. This will minimise the risk of duplication of effort and unnecessary disturbance to breeding birds.

8.3. Timescales for Reporting

Following each year of monitoring, at least one KCSG meeting will be organised to present the findings and discuss how these will be reported. In accordance with Schedule 18, Part 1, Paragraphs 3 (f) and 7 of the East Anglia TWO DCO, an annual report will be produced and provided to the KCSG and SoS as soon as practical each year. The anticipated stages for producing the annual reports are provided in Figure 6.

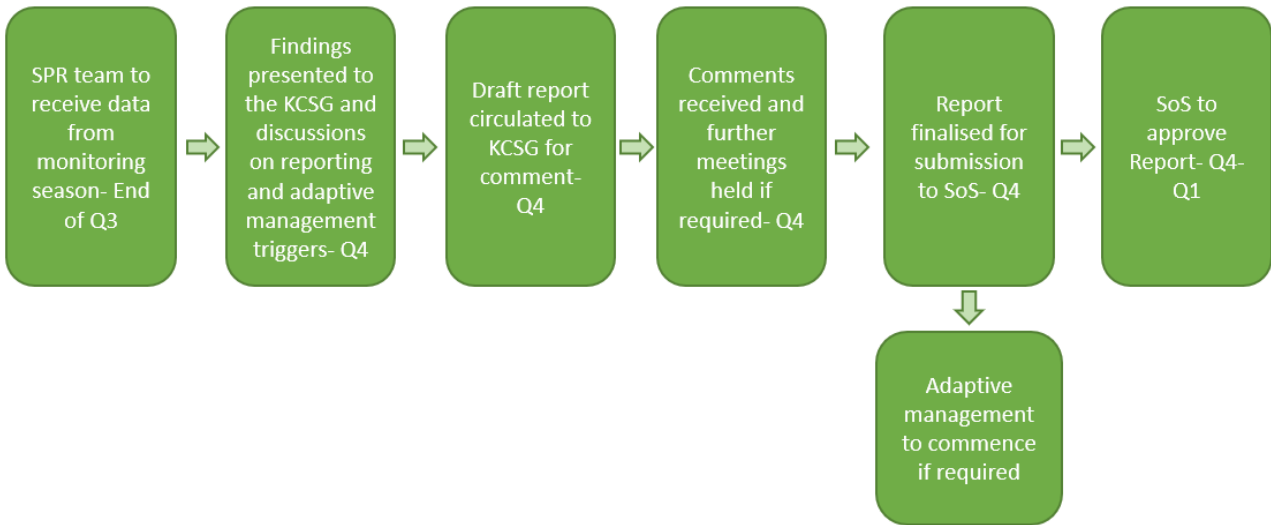


Figure 6: Annual reporting to the SoS

To avoid duplication and streamline the review process, a single combined annual monitoring report will be submitted each year on behalf of the Norfolk Projects and East Anglia ONE North and TWO.

9. COMPENSATION PERFORMANCE AND MONITORING ADAPTIVE MANAGEMENT

Paragraph 7 of the East Anglia TWO compensation schedule states that for the annual reporting:

‘Results from the monitoring scheme must be submitted at least annually to the Secretary of State and the relevant statutory nature conservation body. This must include details of any finding that the measures have been ineffective in securing an increase in the number of adult kittiwakes available to recruit to the SPA and, in such case, proposals to address this. Any proposals to address effectiveness must thereafter be implemented by the undertaker as approved in writing by the Secretary of State in consultation with the relevant statutory nature conservation body.’

On the advice of NE, an expert group was convened on the 6th October 2022, to consider how to monitor the success of the compensation. The expert group was attended by representatives from the UK Centre for Ecology and Hydrology (UKCEH) and the RSPB (NE did not have capacity to attend). It was agreed through discussion in this group that, while productivity was the ultimate measure of success, it was critical that the reasons for any shortfall were recorded in order that appropriate remedial steps (if warranted) could be taken. Thus, while it was agreed that it was sensible to set targets for colony performance these metrics should be used as a framework for monitoring and that it is just as important that consideration is given to an understanding of the status of kittiwake colonies more widely, in order to determine the compensation colony’s relative performance.

Thus, the performance of the new colony should not be viewed in isolation but should be seen in the wider context of kittiwake breeding success locally (i.e. Lowestoft) and regionally (e.g. southern North Sea). Hence, poor breeding success at the compensation colony in a year when this is also seen at most other kittiwake colonies locally or regionally would be indicative of wider issues (e.g. reduced prey stocks or adverse weather conditions) and would not automatically trigger remedial action at the compensation colony. However, under these circumstances ScottishPower Renewables, in collaboration with Vattenfall for the Norfolk Projects, would look to understand the reasons for poor reproductive performance at the compensation colony, attempt to identify potential remedies and collaborate with relevant groups to understand the wider context in terms of other local or regional colony breeding success.

Conversely, if the compensation colony performs less well than other monitored sites, this would be a strong indicator that action is required to identify and address the causes.

During the initial years following installation of the nesting structures (e.g. years one to five), monitoring is expected to be focussed on understanding the mechanisms for colonisation. For example, there may evidence

that birds are not prospecting at the new structure, or prospecting but not settling, or settling but abandoning during nest building, etc. and each of these would lead to a requirement for different remedial measures. Data will be collected with the aim of understanding the reasons for whichever of these may be occurring, such as the suitability of the nesting ledges or protection from weather and predators and the most appropriate corresponding responses. Other factors which will be monitored will include nest attendance rates and foraging trip duration, as these will indicate the degree of effort required by the breeding adults and may indicate reasons for reproductive failure. As noted above, it will also be necessary to conduct similar monitoring at a sample of other locations to understand if any observed patterns are replicated elsewhere.

If colonisation does occur in the initial years (i.e., years one to five following construction of the nest structures) and initial recruits have good breeding success, but the rate of colony growth appears to be lower than would be needed for the colony to reach capacity within five years then reasons for this will be investigated. This may highlight avoidance of particular areas of the structures (e.g., more exposed, further from the sea, etc.), which could be targeted for modification or highlight that additional effort in attracting birds would be beneficial (e.g., use of decoys and broadcasting colony calls).

The monitoring and requirements for adaptive management will be conducted on an annual basis at least until such time as it is agreed that the colony is self-sustaining and performing at least as well as other local colonies.

As discussed above, the adaptive management measures to be considered will depend on the circumstances, however actions may include:

- Encouragements to attract and accelerate recruitment through use of colony playback, placement of old kittiwake nests on shelves and installation of decoy birds;
- Structural modifications to improve suitability (e.g. addition of vertical baffles, change in ledge width, increased weather or predator protection, etc.);
- If productivity (per pair) appears to be lower than would be expected then the causes will be investigated and options such as supplementary feeding explored (note however this option would require careful consideration to rule out other more systemic causes, such as collapse of prey stocks, that short-term feeding would be unable to make up for); and,
- Provision of nesting material (if this appears to be limiting).

If there appear to be problems caused by the structures themselves, these will be addressed through targeted modifications, extension, orientation, increased weather protection, improved predator protection and/or disturbance prevention. For example, should the presence of predatory gulls nesting on the roof of the structures be linked with a reduction in productivity the option to add a more steeply pitched roof, or other suitable deterrent, could be implemented (see Section 5 for further detail).

As a final consideration, alternative locations which may accommodate alternative structure designs (such as the tower design set out in Annex 5) will be considered.

Monitoring in 2023 demonstrated that the wall structures were not successfully colonised, with no evidence of any breeding pairs using the structures. At KCSG meeting six on 29th September 2023, it was agreed to implement adaptive management measures to attempt to improve the likelihood of colonisation in the 2024 breeding season. These comprised:

- Placement of four decoy kittiwake models at visible locations on the nesting structures prior to the 2024 breeding season, increased to eight deployed kittiwake models following advice set out by DESNZ on 9th January 2024 in response to the adaptive management proposals in the Kittiwake Compensation Monitoring Report 2023;
- Intermittent playback of colony calls as soon as practical following the first observations of kittiwakes in the area; and
- Placement of old nests (20 were collected from other locations around Lowestoft) on the nest structures, possibly supplemented with 'fake' nests made from similar materials.

These measures are expected to be implemented prior to or during the 2024 breeding season, as appropriate.

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