



FIVE
ESTUARIES
OFFSHORE WIND FARM

FIVE ESTUARIES
OFFSHORE WIND FARM
LESSER BLACK-BACKED GULL
COMPENSATION - ECOLOGICAL
EVIDENCE, APPROACH TO SITE
SELECTION AND ROADMAP

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DEFINITION OF ACRONYMS

Term	Definition
AEoI	Adverse Effects on Integrity
AOE	Alde-Ore Estuary
AON	Apparently Occupied Nests
AOT	Apparently Occupied Territories
DCO	Development Consent Order
ETG	Expert Topic Group
HRA	Habitats Regulations Assessment
IROPI	Imperative reasons of overriding public interest
MMF	Mean-max foraging range
OOEG	Offshore Ornithology Engagement Group
RAG	Red, Amber, Green
RSPB	Royal Society for the Protection of Birds
SD	Standard Deviation
SMP	Seabird Monitoring Programme
SNCB	Statutory Nature Conservation Bodies
SPA	Special Protection Area
VE	Five Estuaries Offshore Wind Farm
VE OWFL	Five Estuaries Offshore Wind Farm Limited



1 INTRODUCTION

1.1 BACKGROUND

FIVE ESTUARIES OFFSHORE WIND FARM

- 1.1.1 Five Estuaries Offshore Wind Farm (VE) is a proposed extension to the operational Galloper Offshore Wind Farm. VE will be situated approximately 37 km off the coast of Suffolk, England (at its closest point).
- 1.1.2 As part of the Development Consent Order (DCO) application, Five Estuaries Offshore Windfarm Ltd (VE OWFL) is required to produce a Report to Inform Appropriate Assessment (RIAA) in order to provide the information required by the Competent Authority in order to undertake its Habitats Regulation Assessment (HRA) and Appropriate Assessment. If the HRA process deems that Adverse Effects on Integrity (AEol) cannot be excluded, a derogation process is then followed. In the event that no alternative solutions can be found, and if there are imperative reasons of overriding public interest (IROPI), the final stage of the derogation process is to develop measures to compensate for adverse effects on the integrity of a site.

DEROGATION PREPARATION

- 1.1.3 In order to allow for sufficient time to engage with stakeholders and develop compensation plans, VE OWFL is investigating compensation options for species where it has not been possible to rule out AEol at this early stage in the pre-application period, however it should be noted that this does not prejudice the outcome of the ongoing HRA process.
- 1.1.4 The key ornithological derogation risk for VE for lesser black-backed gull (*Larus fuscus*) relates to Alde-Ore Estuary (AOE) Special Protection Area (SPA).
- 1.1.5 AOE SPA is 15 km from VE, and within mean-max foraging range (MMF) MMF + 1 standard deviation (SD) from VE for lesser black-backed gull, and there is therefore potential connectivity between the SPA and VE. Concern regarding collision risk has been raised for lesser black-backed gull on other projects by Natural England (NE), and recent decisions on other offshore wind projects (e.g., Norfolk Boreas, Norfolk Vanguard, East Anglia ONE North and East Anglia TWO) concluded that AEol could not be ruled out for lesser black-backed gull at AOE SPA when considered in-combination with other projects. The conclusion of AEol in respect of the other projects increases the likelihood that the same conclusion for this project will be reached. Given the proximity of VE to the AOE SPA and results of preliminary assessment, it is deemed likely that there will be an AEol in-combination in relation to the LBBG feature of the AOE SPA from VE, and that compensation for this effect will thus be required.
- 1.1.6 VE OWFL has identified potential compensation measures for VE and created a 'longlist' of all possible compensation options at AOE SPA (and other protected sites for other species potentially requiring compensation). The longlisted options are based on the existing VE project proposal, experience with HRA derogation matters in the UK and stakeholder consultation with Natural England. These longlisted options are discussed in 'Five Estuaries Offshore Wind Farm: Potential compensation measures longlist report' (VE OWFL, 2022a).



- 1.1.7 The longlist options were narrowed down to a shortlist following a ranking criteria assessment (otherwise known as a Red-Amber-Green (RAG) assessment), and discussed in 'Five Estuaries Offshore Wind Farm: Compensation measures shortlist technical note' (VE OWFL, 2022b). The ranking approach is provided in 'Five Estuaries Offshore Wind Farm: Compensation measures ranking approach note' (VE OWFL, 2022c). Longlisted measures were scored against a number of categories, with scores for each category summed to provide a total score. The measures were then allocated to “red”, “amber” and “green” groups based on their total score, and “green” measures taken forward to the shortlist of compensation options.
- 1.1.8 Following shortlisting and subsequent stakeholder feedback (document reference: DAS/14393/400223), it was deemed that the compensation options of predator exclusion fencing and habitat creation are deemed most feasible for lesser black-backed gull. Predator exclusion fencing around a breeding colony of lesser black-backed gulls is known to be an effective method to reduce nest predation and increase breeding success and technically feasible with existing technology in place. Habitat creation/restoration is another compensation measure that is technically feasible with suitable land adjacent to the SPA and known to be a successful method in increasing breeding populations. The other shortlisted measures for compensation were ruled out for various reasons, supplementary feeding has potential side effects on non-target species and the wider food chain, predator management is a less viable option to the predator exclusion fencing.
- 1.1.9 The potential lesser black-backed gull mortality from Five Estuaries (individuals per annum) is fewer than eight individuals as per the draft RIAA. The resulting compensation requirement (number of additional breeding pairs required to provide the necessary compensation quantum per annum), will be calculated at a later date, but prior to the submission of the DCO application, and once the wind farm parameters have been finalised because the impact may be subject to change. It is proposed that demographic data for lesser black-backed gull from Horswill & Robinson (2015) will be used to calculate the number of additional breeding pairs required to produce sufficient breeding adults back into the bio-geographic population to compensate for the predicted impacts.

1.2 AIMS AND OBJECTIVES

- 1.2.1 This document collates and presents the ecological evidence for predator exclusion fencing and habitat creation, outlines site selection work progressed to date, and provides a roadmap for compensation development and implementation for both compensation measures. Predator exclusion fencing is covered in Section 2, and habitat creation in Section 3.



2 PREDATOR EXCLUSION FENCING

2.1 AIMS

2.1.1 In this section, ecological evidence on the feasibility and effectiveness of predator exclusion fencing is reviewed (Section 2.2), focusing on predation issues in lesser black-backed gull and the effectiveness of exclusion fencing for improving breeding performance and population size. Secondly, potential delivery sites are identified as part of preliminary site selection (Section 2.3), and finally a roadmap for compensation development and implementation is provided (Section 2.4).

2.2 ECOLOGICAL EVIDENCE

LESSER BLACK-BACKED GULL

2.2.1 Lesser black-backed gull breed in northern and western Europe and north-west Russia, with many UK birds moving to Southern Europe and Africa to winter, although increasingly large numbers remain in the UK, particularly England, in winter (Burton *et al.*, 2012; Robinson, 2005; Ross-Smith *et al.*, 2014).

2.2.2 The Seabird 2000 survey estimated that the UK breeding population in 2000 was 87,413 Apparently Occupied Nests (AON) in size, growing from 48,217 in 1970 (JNCC, 2021).

2.2.3 Individuals have a typical lifespan of around 15 years, with birds reaching maturity at 4 years of age (Robinson, 2005).

2.2.4 Lesser black-backed gull nest in colonies, often with other gull species, in particular the closely related herring gull (*Larus argentatus*). They breed in a wide range of habitats, including coastal cliffs, sand dunes, marshes, moorlands and man-made sites (e.g. rooftops) (Mitchell *et al.*, 2004). Lesser black-backed gull breeding in natural habitats nest on the ground, generally preferring nest sites with some vegetation cover (Calladine, 1997).

2.2.5 Lesser black-backed gull are omnivorous and feed on a wide range of food sources, including fish, fisheries discards, waste from refuse sites and moles (*Talpa europea*) (Gyimesi *et al.*, 2016; Robinson, 2005; Sherley *et al.*, 2019).

PREDATION IN LESSER BLACK-BACKED GULL

2.2.6 Lesser black-backed gull eggs and chicks are predated by a range of predators. The main mammalian predators in the UK are foxes (*Vulpes vulpes*) and mink (*Neovison vison*) (Craik, 2007; Furness, 2013; Ross-Smith *et al.*, 2014). Lesser black-backed gull also suffer predation from avian predators, for example herring gull and raven (*Corvus corax*) (Bukacinski, 1998; Bustness *et al.*, 2022; Hario, 1994).

2.2.7 Predation is known to have population-level effect on lesser black-backed gull, with reduced population growth evident: Across six colonies in the UK, Davis *et al.* (2018) show that a higher presence of foxes was linked to lower productivity. Similarly, predation by American Mink has been linked with reduced productivity across colonies in south-west Scotland (JNCC, 2021).



PREDATOR EXCLUSION FENCING

- 2.2.8 Predator exclusion fencing can be an effective conservation measure for lesser black-backed gull; past studies have shown that nest survival rates can increase when reducing chick predation. For example, Davis *et al.* (2018) showed that lesser black-backed gull productivity increased in areas with exclusion fencing (for foxes). Nest survival was high in both fenced and unfenced areas, which suggests that the installation of exclusion-fencing at the colony increases survival at the chick (rather than nest) stage.
- 2.2.9 More widely, there is clear evidence of predator-proof fencing being an effective seabird conservation measure, including for the protection of multiple petrel, shearwater and albatross species across New Zealand, Hawaii and Portugal (Cooper 2013).
- 2.2.10 There is also precedent for the use of predator fencing as a compensation measure for predicted offshore wind impacts on lesser black-backed gull in the UK. Norfolk Boreas, Norfolk Vanguard, East Anglia One North and East Anglia Two are delivering improved (New Zealand-style) predator fencing in AOE SPA as compensation for their predicted impacts on lesser black-backed gull at that SPA (MacArthur Green and Royal HaskoningDHV, 2022).

2.3 APPROACH TO SITE SELECTION

LESSER BLACK-BACKED GULL BREEDING SITES

- 2.3.1 Preliminary site selection, as presented here, focused on identifying lesser black-backed gull colonies, both within and outside SPAs, which could be potentially suitable locations for compensation delivery. Sites were identified using the Seabird Monitoring Programme (SMP) survey data.¹ All lesser black-backed gull colony count data were downloaded and filtered according to the following criteria for suitability:
- > Country = England – English colonies only were selected as compensation is generally expected to be delivered in the country as where the impacts are experienced. Other nations could be explored should no suitable sites within England be identified, in which case further work on the legislative and legal aspects of compensation delivery abroad may be needed;
 - > Year = 1998-2022. The most recent complete colony census was Seabird 2000, which was surveyed from 1998-2002. Therefore, including data from 1998 onwards ensures comprehensive coverage of all colonies;
 - > Site type = “coastal” or blank (to remove colonies labelled “inland”) – this is based on the assumption that as a coastal breeding colony is predicted to be impacted by VE, a coastal colony should thus be preferably selected for compensation delivery, although this search could be widened to include inland colonies should site selection prove unsuccessful for coastal sites;
 - > Site habitat = “natural” or blank (to remove colonies on “man-made structures”); and
 - > Count \geq 50 (to only extract larger colonies, as colonies with few breeding pairs are unlikely to grow rapidly enough to provide sufficient compensation). This search

¹ Seabird Monitoring Programme, <https://app.bto.org/seabirds/public/data.jsp> [Accessed August 2022]



could be widened to include smaller colonies should site selection prove unsuccessful for sites with larger colonies.

- 2.3.2 For the remaining list of sites, only the most recent entry for each site was retained.
- 2.3.3 For sites for which “site type” and “site habitat” were left blank, the site coordinates were plotted on a map, using the grid reference provided in the SMP data, to identify whether the colony was coastal or inland, and located on natural or man-made structures. All remaining inland and/or man-made colonies were removed.
- 2.3.4 Table 2.1 provides a list of the sites identified using the criteria outlined in paragraphs 2.3.1 to 2.3.3, and also presents current population count data for the SPA.
- 2.3.5 Site selection is to be refined further to obtain a shortlist of potential sites for compensation delivery. Next steps for site selection are outlined in the roadmap presented in Section 2.4.

Table 2.1: Coastal, natural lesser black-backed gull colonies in England with a count of 50 or more Apparently Occupied Nests or Apparently Occupied Territories (data source: Seabird Monitoring Programme¹). AON: Apparently Occupied Nests; AOT: Apparently Occupied Territories; IND: Individuals. * indicates SPAs for which lesser black-backed gulls are a qualifying feature.

Master site	Site	County	Count Year	Count type	Count
Alde Ore Estuary SPA*	Havergate Island	Suffolk	2019	AON	1,670
	Orfordness Beach	Suffolk	2018	AON	97
Blackwater Estuary SPA	Pewet Island	Essex	2009	IND	171
Bowland Fells SPA*	Langden Head	Lancashire	2018	AON	5,573
Coquet Island SPA	Coquet Island RSPB	Northumberland	2005	AON	50
Farne Islands SPA	Farne Islands	Northumberland	2019	AON	681
Hamford Water SPA	Hamford Water	Essex	2009	AON	600
Highbridge and Isleport	Highbridge	Somerset	2016	AON	131
Isles of Scilly SPA*	Annet	Isles of Scilly	2006	AOT	281
	Great Arthur	Isles of Scilly	2015	AON	76
	Great Ganilly	Isles of Scilly	2015	AON	70
	Gugh	Isles of Scilly	2019	AON	422
	Norwethal	Isles of Scilly	2015	AON	102
	Puffin Island	Isles of Scilly	2015	AON	97
	Samson	Isles of Scilly	2015	AON	978



Master site	Site	County	Count Year	Count type	Count
	Shipman Head	Isles of Scilly	1999	AON	50
	St Helen's	Isles of Scilly	2015	AON	448
	Tean	Isles of Scilly	2015	AON	136
	White Island (St Martin's)	Isles of Scilly	2015	AON	106
Lundy	Lundy	Devon	2021	AON	91
Maryport	Maryport	Cumbria	2013	AON	95
Medway Estuary and Marshes SPA	Greenborough	Kent	2018	IND	56
Morcambe Bay and Duddon Estuary SPA*	Hodbarrow RSPB	Cumbria	2009	AON	250
	South Walney	Cumbria	2020	AON	381
North Norfolk Coast SPA	Blakeney Point	Norfolk	2001	AON	171
	Holkham NNR	Norfolk	2014	AON	85
Ribble and Alt Estuaries SPA*	Ribble Estuary	Lancashire	2021	AON	4,489
South Solway	RAF Carlisle	Cumbria	2009	AON	520
	Rockcliffe Marsh	Cumbria	2019	AON	260
St Martin's Island	St Martin's	Isles of Scilly	1999	AON	52
Steep Holm	Steep Holm	Avon	2018	AON	596
The Wash SPA	Outer Trial Bank	Norfolk	2018	AON	1,294

2.4 ROADMAP

2.4.1 A proposed roadmap for the development of predator exclusion fencing as a compensation measure is provided in the following sections below.

SITE SELECTION

2.4.2 The preliminary site selection process outlined in Section 2.3 revealed several locations which support substantial coastal populations of lesser black-backed gull in England.

2.4.3 Proposed next steps for site selection comprise of:

1. From the list of sites presented in Section 2.3 above, establish which sites have predation issues. This will be completed through a review of management plans and other relevant documents for each site, as well as by contacting the relevant site managers and/or landowners to obtain local and up to date information [note, site manager engagement is underway at the time of writing].



2. Identify relevant landowners and stakeholders and discuss opportunity and willingness for installation of predator exclusion fencing.
 3. For sites which are deemed potentially suitable following the completion of step 1 and 2 above:
 - > Describe, and where possible quantify, the extent of the predation issue at the site (e.g. using historical population data and information on predator presence/numbers); and
 - > Study the feasibility of excluding predators at the selected site. Factors to be taken into consideration include, but are not limited to, local geography, access and anticipated cost. Consultation with exclusion fence experts is anticipated to be needed at this point in the site selection process to establish fencing type/technique, feasibility and cost.
 4. For sites meeting the feasibility requirements in step 3, quantify the expected benefit to lesser black-backed gull as a result of the predator exclusion fencing measure, to ensure the potential site(s) can meet compensation requirements.
 5. Liaison with stakeholders and landowners, working towards formal agreements. As part of this work, details such as land ownership and feasibility of permission/purchase will be investigated.
- 2.4.4 As highlighted in Section 2.3, should site selection be unsuccessful based on the criteria presented here, the search can be widened to investigate sites with smaller colonies, or within non-coastal areas (e.g. uplands).
- 2.4.5 In order to ensure that the compensation measure meets the requirement of maintaining the national site network coherence, there should be optimal connectivity between the potential delivery site and one or more SPAs. Therefore, should multiple potential sites for predator exclusion fencing be identified once site selection has been completed following the steps outlined above, prioritisation of potential sites is proposed to be based on connectivity with SPAs, as follows:
- > Sites within MMF of AOE SPA – to prioritise sites as close as possible to the impacted SPA;
 - > Sites within MMF+1SD of AOE SPA;
 - > Sites in/adjacent to an SPA (other than AOE) with LBBG as a qualifying feature;
 - > Sites within MMF of an SPA (other than AOE) with LBBG as a qualifying feature; and
 - > Sites within MMF+1SD of an SPA (other than AOE) with LBBG as a qualifying feature.
- 2.4.6 Where needed, further reporting can be produced to evidence connectivity between any identified non-SPA delivery sites and the National Site Network. This would likely be completed through a review of known breeding dispersal behaviour and recorded dispersal distances in lesser black-backed gull, to evidence that birds hatched at the proposed predator-fenced site can feasibly disperse to breed at sites within the National Site Network.



STAKEHOLDER ENGAGEMENT AND CONSULTATION

- 2.4.7 Stakeholder engagement will be required throughout the development of the predator exclusion measures.
- 2.4.8 In addition to consultation with local experts and stakeholders during the site selection process outlined above, compensation plans are being consulted upon with relevant stakeholders, most notably Natural England, before DCO application submission. Consultation on compensation plans to date has consisted of Natural England feedback on the shortlist and longlist of compensation measures (VE OWFL, 2022a; VE OWFL, 2022b), and further consultation is planned as the development of predator exclusion fencing compensation plans progresses.
- 2.4.9 Prior to submission appropriate sites will be identified and discussions with land owners and local planning authorities (LPAs) will be progressing with an aim to have agreements and permissions in place pre-application submission. An outline implementation and monitoring plan will be submitted with the DCO application. Pre-consent an expert topic group (ETG) will be used to engage with regulators and interested stakeholders. Should consent for the project be granted, a steering group, to be termed the “Offshore Ornithology Engagement Group” (OOEG) will be convened by VE OWFL. This group will help steer the delivery of any compensation measure implementation and maintenance, monitoring, reporting, and any other relevant matters as determined by VE OWFL in discussion with the OOEG participants. It is envisaged that core members of the OOEG will be the relevant Statutory Nature Conservation Bodies (SNCBs), as well as the local planning authority and owners and/or managers of the site(s) at which predator fencing is planned to be implemented. The Royal Society for the Protection of Birds (RSPB) and other relevant parties will also be invited to form part of the OOEG in an advisory capacity.

MONITORING PLAN

- 2.4.10 It is anticipated that monitoring will be required for all stages of the proposed predator exclusion program (i.e., pre-, during and post- predator exclusion). The detail of monitoring proposals will be developed pre-application and finalised in consultation with the OOEG. The following details will form the outline of the monitoring plan, that will be refined and adapted in consultation with the OOEG:
- > Monthly baseline surveys during the breeding season.
 - > Monthly predator monitoring throughout the year.
 - > Use appropriate methods found in the Seabird monitoring handbook for Britain and Ireland (Walsh *et al* 1995).
 - > Annual reports recording changes in breeding success and productivity.



- 2.4.11 Pre-implementation monitoring will be undertaken at the selected site(s), with the goal being to quantify the abundance and distribution of predators. Where possible, this will be further supplemented with the collection of indirect and/or direct evidence of predation on seabirds. Pre-implementation monitoring will also incorporate collection of other relevant data, such as up-to-date seabird population counts and productivity data where possible. It is envisaged that population data can be obtained from the SMP database, but this could be supplemented with local or more recent datasets – consultation with site managers can be used to identify such additional data sources. Where needed, additional pre-implementation in-field monitoring of lesser black-backed gull could take place. The pre-implementation datasets will be used as a baseline, against which any population and/or productivity changes can be assessed to determine the success of the predator exclusion measure.
- 2.4.12 Following implementation of the predator exclusion fence, monitoring of both targeted predators and lesser black-backed gull populations will be undertaken by an experienced field surveyor/ornithologist and compared to data collected during pre-implementation monitoring. It is expected that monitoring will be undertaken at regular intervals during the operational phase of VE, with the frequency and duration of the monitoring program to be agreed with the OOEG. It is envisaged that frequent monitoring will initially be undertaken, and the monitoring program continued until the required compensation quantum is reached (or alternative adaptive management measures have been implemented if required, see paragraph 2.4.13).

ADAPTIVE MANAGEMENT

- 2.4.13 Should post-implementation monitoring reveal that the predator exclusion program is unsuccessful, or less successful than anticipated, an assessment will be undertaken to determine the reasons underlying the lack of success, and to inform the next steps. Notably, next steps will consist of identifying potential improvements (or extensions) to the implemented measure, based on potential issues discovered during the assessment. Should the assessment determine that the measure cannot be improved or extended sufficiently, then alternatives, such as contribution to the Marine Recovery Fund (or equivalent), may be considered in consultation with the OOEG. Depending on the reason for the program being unsuccessful the following steps will be considered:
- > Extension of fencing (height or boundaries).
 - > Breeding habitat creation.
 - > More regular monitoring during breeding season.
 - > Bycatch reduction in foraging areas.



3 HABITAT CREATION

3.1 AIMS

3.1.1 In this section, ecological evidence on the feasibility and effectiveness of habitat creation for lesser black-backed gull is reviewed (Section 3.22.2), focusing on reviewing lesser black-backed gull habitat requirements and the effectiveness of habitat creation. Secondly, potential delivery sites are identified as part of a preliminary site selection process (Section 3.3), and finally a roadmap for compensation development and implementation is presented (Section 3.4).

3.2 ECOLOGICAL EVIDENCE

LESSER BLACK-BACKED GULL

3.2.1 See Section 2.2 for a general introduction to lesser black-backed gull.

HABITAT REQUIREMENTS

3.2.2 Lesser black-backed gull nest in colonies in a range of habitats, though generally showing a preference for flat, level-ground that is covered by close, short vegetation. A key factor in suitable nest locations is the availability of suitable shelter, reducing exposure to extreme weather and predators (Partridge 1978). Lesser black-backed gull often nest under bracken (*Pteridium sp*), burdock (*Articum sp*), heather (*Calluna sp*) and nettle (*Urtica sp*) (BirdLife International, 2023; Ross-Smith *et al.* 2015). Specifically, intermediate and tall vegetation (~100 to 400mm) has shown to be important in providing the optimal nest microclimate for breeding birds (Kim and Monaghan, 2015). Their natural habitats can range from flat open ground to sand dunes, rocky offshore islands, high moorland and ledges on cliff faces.

HABITAT CREATION

3.2.3 Creating or restoring suitable nesting habitat helps increase breeding site availability. It can help create new breeding habitat in areas where lesser black-backed gull have not nested previously, but could also restore breeding habitat that was lost when sites used previously have become overgrown (Ross-Smith, 2014).

3.2.4 Ross-Smith *et al.* (2015) outlined the benefit for lesser black-backed gull of providing a mixture of open ground and shelter, whilst avoiding the presence of taller, denser vegetation which prevents birds flying or walking in or out.

3.2.5 Such habitat creation/improvement could be delivered across a wide range of lesser black-backed gull habitat types. Existing techniques (see for example Ausden (2007)) that would align with lesser black-backed gull nesting requirements include:

- > Grassland improvement – partial mowing (sward management) of areas of grassland to create height diversity throughout the area, to encourage the availability of both open ground for nesting, and higher vegetation for shelter;
- > Sand dune restoration – the removal of scrub and trees (e.g. willow, gorse) to ensure an open vegetation profile for nesting is maintained; and
- > Moorland restoration – e.g. the removal of scrubs and trees on moorland or areas of coastal heather to prevent succession and maintain suitable low, open breeding ground for breeding lesser black-backed gull.



- 3.2.6 In addition to improving the natural habitat, the provision of artificial shelter could also be beneficial (Ross-Smith *et al.*, 2015), although published evidence of artificial shelters for this species is limited, so further consultation with species experts would likely be needed to identify suitable designs should this option be progressed.
- 3.2.7 There is precedent for the use of habitat creation within compensation plans for offshore windfarm impacts. The Norfolk Projects Offshore Wind Farms (Norfolk Boreas, Norfolk Vanguard), as part of their predator fencing work, plan to carry out vegetation cutting to create suitable sward height (within areas around which predator fencing will be installed), and further habitat management options are included in the adaptive management plans (MacArthur Green and Royal Haskoning, 2022a). In addition to natural vegetation management, Norfolk Projects Offshore Wind Farms propose the use of railway sleepers as artificial shelter for nesting against (Royal Haskoning, 2022). More widely, habitat creation is also proposed as a standalone compensation measure for seabirds, with, for example, nesting habitat improvements and restoration of lost breeding range proposed as compensation for Sandwich tern for Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects (MacArthur Green and Royal HaskoningDHV, 2022b).

3.3 PRELIMINARY SITE SELECTION

- 3.3.1 See Section 2.3 for preliminary site selection completed to date.

3.4 ROADMAP

- 3.4.1 In the sections below, a proposed roadmap for the development of habitat creation as a compensation measure is provided.

SITE SELECTION

- 3.4.2 The preliminary site selection process outlined in Section 2.3 revealed several locations which support substantial coastal populations of lesser black-backed gull in England.
- 3.4.3 Proposed next steps for site selection comprise of:
1. From the list of sites presented in Section 2.3 above, identify locations where nesting habitat within or adjacent to the site could be created or improved. This will be completed through a review of management plans and other relevant documents, as well as a desk-based study in which land cover maps and aerial imagery will be explored to identify sites with potentially suitable habitat. This will take into consideration the habitat characteristics outlined in paragraph 3.2.2.
 2. Identify relevant landowners and stakeholders to discuss:
 - > Reasons behind a limited (or lack of) breeding presence by lesser black-backed gull in the identified areas, to determine whether habitat creation could aid the species at the identified site;
 - > Opportunity and willingness for the implementation of habitat creation measures; and
 - > Suitable habitat creation techniques at the identified site.
 3. For sites which are deemed potentially suitable following the completion of step 1 and 2 above:



- > Describe, and where possible quantify, the opportunity for habitat creation at the site. This is to include information, where available, on current habitats (e.g. habitat type, condition, extent), information on (historic) lesser black-backed gull presence, and options for habitat improvements; and
 - > Assess the feasibility of habitat creation or improvement measures at the selected site. Factors to be taken into consideration include, but are not limited to, local geography, access and anticipated cost. Further consultation with land managers and ecological management experts may be required at this point in the site selection process to establish appropriate techniques and feasibility.
4. For sites meeting the feasibility requirements in step 3, where possible quantify the expected benefit to lesser black-backed gull as a result of the habitat creation measure(s), to evidence that the potential site(s) can meet compensation requirements.
5. Liaison with stakeholders and landowners, working towards formal agreements. As part of this work, details such as land ownership and feasibility of permission/purchase will be investigated.
- 3.4.4 As highlighted in Section 2.3, should site selection be unsuccessful based on the criteria presented here, the search can be widened to investigate sites with smaller colonies, or within non-coastal areas (e.g. uplands).
- 3.4.5 In order to ensure that the compensation measure meets the requirement of maintaining the national site network coherence, there should be optimal connectivity between the potential delivery site and one or more SPAs. Therefore, should multiple potential sites for habitat creation be identified once site selection has been completed following the steps outlined above, prioritisation of potential sites is proposed to be based on connectivity with SPAs, as follows:
- > Sites within MMF of AOE SPA – to prioritise sites as close as possible to the impacted SPA;
 - > Sites within MMF+1SD of AOE SPA;
 - > Sites in/adjacent to an SPA (other than AOE) with LBBG as a qualifying feature;
 - > Sites within MMF of an SPA (other than AOE) with LBBG as a qualifying feature; and
 - > Sites within MMF+1SD of an SPA (other than AOE) with LBBG as a qualifying feature.
- 3.4.6 Where needed, further reporting can be produced to evidence connectivity between any identified non-SPA delivery sites and the National Site Network. This would likely be completed through a review of known breeding dispersal behaviour and recorded dispersal distances in lesser black-backed gull, to evidence that birds hatched at the proposed habitat creation site can feasibly disperse to breed at sites within the National Site Network.



STAKEHOLDER ENGAGEMENT AND CONSULTATION

- 3.4.7 Stakeholder engagement will be required throughout the development of the habitat creation planning process.
- 3.4.8 In addition to consultation with local experts and stakeholders during the site selection process outlined above, compensation plans are being consulted upon with relevant stakeholders, most notably Natural England, before DCO application submission. Consultation on compensation plans to date has consisted of Natural England feedback on the shortlist and longlist of compensation measures (VE OWFL, 2022a; VE OWFL, 2022b), and further consultation is planned as the development of habitat creation compensation plans progresses.
- 3.4.9 Should consent of the project be granted, a steering group, to be termed the OOEG, as noted in paragraph 2.4.9, will be convened by VE OWFL. This group will help steer the delivery of any compensation measure implementation and maintenance, monitoring, reporting, and any other relevant matters as determined by VE OWFL in discussion with the OOEG participants. It is envisaged that core members of the OOEG will be the relevant Statutory Nature Conservation Bodies (SNCBs), as well as the local planning authority, and owners and/or managers of the site(s) at which habitat creation is planned to be implemented. The Royal Society for the Protection of Birds (RSPB) and other relevant parties will also be invited to form part of the OOEG in an advisory capacity.
- 3.4.10

MONITORING PLAN

- 3.4.11 It is anticipated that monitoring will be required for all stages of the proposed habitat creation program (i.e., pre-, during and post- habitat creation). The details of monitoring proposals will be discussed with the OOEG, with key details to be agreed upon likely to include the frequency, duration and nature of monitoring methodology, as well as data analysis and reporting requirements.
- 3.4.12 Pre-implementation monitoring will be undertaken at the selected site(s), with the goal being to establish the current habitat condition and extent of required improvements. Pre-implementation monitoring will also incorporate collection of other relevant data, such as up-to-date seabird population counts and productivity data where possible. It is envisaged that population data can be obtained from the SMP database, but this could be supplemented with local or more recent datasets – consultation with site managers can be used to identify such additional data sources. Where needed, additional pre-implementation in-field monitoring of lesser black-backed gull could take place. The pre-implementation datasets will be used as a baseline, against which any population and/or productivity changes can be assessed to determine the success of the habitat creation measure.



3.4.13 Following implementation of the habitat creation measure, post-implementation monitoring of the habitat and lesser black-backed gull populations will be undertaken and compared to data collected during pre-implementation monitoring. It is expected that monitoring will be undertaken at regular intervals during the operational phase of VE, with the frequency and duration of the monitoring program to be agreed with the OOEG. It is envisaged that monitoring will initially be undertaken annually, and the monitoring program continued until the required compensation quantum is reached (or alternative adaptive management measures have been implemented if required, see paragraph 2.4.13).

ADAPTIVE MANAGEMENT

3.4.14 Should post-implementation monitoring reveal that the habitat creation program is unsuccessful, or less successful than anticipated, an assessment will be undertaken to determine the reasons underlying the lack of success, and to inform the next steps. Notably, next steps will consist of identifying potential improvements (or extensions) to the implemented measure, based on potential issues discovered during the assessment. Should the assessment determine that the measure cannot be improved or extended sufficiently, then alternatives, such as contribution to the Marine Recovery Fund (or equivalent), may be considered in consultation with the OOEG.



4 COMBINING MEASURES

- 4.1.1 It should be noted that whilst predator fencing and habitat creation are here presented as standalone measures to allow progression of both options as standalone compensation measures, a combination of both measures may be required or desirable. In particular, habitat creation or improvement may be needed or beneficial within a proposed fenced area to increase success. In cases where habitat creation may be needed as part of the delivery of predator fencing, the relevant roadmap steps for habitat creation can be incorporated into the workstreams for predator fencing as required (e.g. habitat creation included in the consultation, implementation plans and monitoring plans for predator fencing).



5 CONCLUSION

- 5.1.1 This document has collated and presented the ecological evidence for predator exclusion fencing and habitat creation, outlined site selection work progressed to date, and provided a roadmap for compensation development and implementation for both compensation measures. VE OWFL is confident that the proposed compensation measures are ecologically effective. As outlined in the roadmap, site selection, stakeholder engagement and implementation planning will be continued by VE OWFL to further ensure and evidence that the proposed measures are viable and can be appropriately secured within the project DCO.



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