FIVE ESTUARIES OFFSHORE WIND FARM

VOLUME 5, REPORT 4.5: LESSER BLACK BACKED GULL COMPENSATION SITE – HABITATS REGULATIONS ASSESSMENT (CLEAN)

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In preparation of this document Five Estuaries Wind Farm Ltd has made reasonable efforts to ensure that the content is accurate, up to date and complete for purpose.

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
A	Mar-24	DCO Application	GoBe	GoBe	VE OWFL
B	Oct-24	Change Request	SLR	GoBe	VE OWFL
C	Dec-24	Update following completion of surveys	SLR	GoBe	VE OWFL
D	Mar-25	Deadline 7	SLR	GoBe	VE OWFL

CONTENTS

TABLES

FIGURES

DRAWINGS

DEFINITION OF ACRONYMS

Term	Definition
AA	Appropriate Assessment
AEoI	Adverse Effects on Integrity
CO	Conservation Objective
DCO	Development Consent Order
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
ES	Environmental Statement
ETG	Expert Topic Group
HRA	Habitats Regulations Assessment
IROPI	Imperative reasons of overriding public interest
LBBG	Lesser Black-backed Gull
LSE	Likely Significant Effect
NNR	National Nature Reserve
NT	National Trust
PCS	Proposed Compensation Site
PIER	Preliminary Environmental Information Report
QI	Qualifying Interest
RIAA	Report to Inform the Appropriate Assessment
RIES	Report on the Implications for European Sites
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SACO	Supplementary Advice on Conservation Objectives
SNCB	Statutory Nature Conservation Bodies
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
VE	Five Estuaries Offshore Wind Farm
VE OWFL	Five Estuaries Offshore Wind Farm Limited

1 INTRODUCTION

1.1 BACKGROUND

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). VE is the subject of an assessment under the Habitats Regulations (a Habitats Regulations Assessment, HRA) including a Stage 1 screening assessment and a Stage 2 Appropriate Assessment (AA). These assessments can only be completed by the competent authority, in this case the Secretary of State for Energy Security and Net Zero. To support the AA, the applicant has produced a Report to Inform the Appropriate Assessment (RIAA) as part of the Development Consent Order (DCO) application. The RIAA identified that an Adverse Effect on Integrity cannot be ruled out for the lesser black-backed gull *Larus fuscus* feature of the Alde-Ore Estuary Special Protection Area (SPA). Therefore, compensatory measures are proposed to ensure the overall coherence of the National Site Network is protected.

1.2 SITE DESCRIPTION

1.2.1 To fulfil the requirement for compensatory measures, the Applicant has identified a Proposed Compensation Site (PCS) at Orford Ness, Suffolk. Orford Ness is a shingle spit which forms part of the Alde-Ore Estuary SPA and Ramsar, and Orfordness to Shingle Street SAC.

1.3 PROJECT OVERVIEW

1.3.1 There is an existing breeding colony of Lesser Black-Backed Gull (LBBG) at Orford Ness which has declined dramatically since the late 1990s. A factor which may be contributing to this decline is predation of the LBBG eggs by foxes and other predators (Davis, et al., 2018). The PCS selection process and rationale are provided separately in the LBBG Evidence, Site Selection & Roadmap document (Volume 5 Report 5, Annex 5.3). The PCS will take the form of predator exclusion fencing around an area(s) of Orford Ness (not at the location of the existing breeding colony) with the aim of excluding mammalian predators, especially foxes, providing a safe refuge for breeding LBBG, and therefore boosting productivity to compensate for losses associated with VE alone and in combination with other offshore wind farms.

1.4 PURPOSE OF THIS REPORT

1.4.1 The installation, maintenance and removal of the predator exclusion fence, and the presence of the fence, may also have adverse ecological impacts on European and Ramsar sites and their qualifying habitats and species. This report provides an assessment of these potential ecological impacts in the format of a Habitats Regulations Assessment.

1.5 EVIDENCE OF TECHNICAL COMPETENCE AND EXPERIENCE

1.5.1 The report was prepared by Richard Arnold BSc Hons MRes MCIEEM CEnv, a Technical Director at SLR Consulting. Richard has 26 years of experience in ecological consultancy.

1.6 RELEVANT LEGISLATION, POLICY AND GUIDANCE

1.6.1 Relevant legislation, policy and guidance includes:

- The Conservation of Habitats and Species Regulations 2017, as amended.
- National Planning Policy Framework [for England], paragraphs 187 and 188, and 192 to 195.
- East Suffolk Council - Suffolk Coastal Local Plan (Adopted September 2020) Policy SCLP10.1: Biodiversity and Geodiversity and Policy SCLP10.2: Visitor Management of European Sites
- Defra guidance Habitats Regulations Assessments: Protecting a European Site[1].

[1] https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

2 METHODOLOGY

2.1 GENERAL APPROACH

2.1.1 The methodology used in this report is based on and in accordance with guidance provided by Defra. The assessment applies only to listed or proposed European and Ramsar sites. More specifically, it only applies to the qualifying interest features of such sites, i.e. the features which are the reason that the site was designated, and the conditions required to support them.

2.2 BASELINE DATA COLLECTION

DESK STUDY

2.2.1 A desk study was undertaken to collate existing information on the designated sites and habitats present within the PCS and 2km from its boundary. This included a review of the information on MAGIC, Natural England's designated sites viewer and reports prepared by MacArthur Green and Royal Haskoning DHV with respect to similar works at Orford Ness, associated with the Norfolk Projects Offshore Wind Farms. Searches for reports on the vegetation communities and ecology of the area were undertaken on Google Scholar and the internet generally. Records of protected, locally scarce and rare species were obtained on 24th April 2024 for the Alde-Ore Ramsar site from the Suffolk Biodiversity Information Centre, including records of species listed on the Ramsar citation.

FIELD SURVEY(S)

INITIAL SITE SURVEY

2.2.2 An initial site survey was conducted on 11th January 2024. During the survey, the vegetation communities present were identified in accordance with the Annex I (EC, 2013), UKBAP priority habitats (BRIG., 2011) and vegetated shingle classification systems (Sneddon & Randall, 1993) and mapped as far as possible (see limitations). In addition, the habitats of the qualifying interest species of designated sites, insofar as these are known/ published, were also identified. Observations of any other species were also recorded. The survey was focused on the perimeter of the survey area but included the whole area. The access track was excluded from the survey because it consists of concrete or bare shingle. The weather during the survey was clear, dry and cold.

VEGETATION

2.2.3 A detailed botanical survey of the semi-natural habitats was undertaken in a part of the survey area (see limitations) using the National Vegetation Classification (NVC) survey method (Rodwell, 2006). This involved recording plant presence and abundance in a series quadrats measuring 2x2 m and mapping the boundaries between community types. Twenty-four quadrats were selected (up to five per community type). In addition, the area was searched for the plant species listed on the Ramsar citation. A map of the vegetation communities to community level was produced in accordance with those published in British Plant Communities (Rodwell, 1991 et seq) and/or (Sneddon & Randall, 1993).

2.2.4 The survey was undertaken on 28/29th August 2024.

TERRESTRIAL INVERTEBRATES

2.2.5 A survey for terrestrial invertebrates was undertaken, comprising sampling of invertebrates from semi-natural habitat within the site. Following standard protocols (Natural England, 2007), a variety of techniques was used, including ground searching and trapping to take samples from each semi-natural habitat type. The survey focused on key groups of invertebrates namely Crustacea, Lepidoptera (moths and butterflies), Odonata (dragonflies), Orthoptera (grasshoppers and crickets) Coleoptera (beetles), Hymenoptera (bees, wasps, ants), Heteroptera (typical bugs), adult Diptera (flies), adult Trichoptera (caddis) and Araneae (spiders). In addition, the area was searched for the species listed on the Ramsar citation and protected and priority species of invertebrate. Three visits were undertaken, in late summer and early autumn, and up to 10 samples were collected from each habitat type during each survey visit. The samples were sorted and the collected animals were identified to species level, where possible, either in the field or in the laboratory. The results were analysed using Pantheon software to aid evaluation of the quality of the site for invertebrates.

2.2.6 The surveys were undertaken on 28th/29th August 2024 (Visit 1), 12th/13th September 2024 (Visit 2) and1st/2nd October 2024 (Visit 3).

LIMITATIONS

2.2.7 The PCS has been amended over time and the survey area has also varied due to land access restrictions.

2.2.8 For the January site survey, the survey area overlapped with the PCS and included land owned by the National Trust (NT) to the east. The northern part of the PCS was not included in the survey area. See Drawing 3. For the Vegetation and Terrestrial Invertebrate Surveys, the surveys were restricted to the National Trust land to the west and were therefore entirely outside the PCS. See Drawing 4. The two survey areas are referred to as the 'Initial Survey Area' and the 'Eastern Survey Area' respectively. Due to the location of the Eastern Survey Area, only inferences can be made about species found within the PCS.

2.2.9 The PCS has proportionally more Sea Couch and/or False-oat grass dominated vegetation, and less salt marsh vegetation, than the Eastern Survey area and it is generally more densely vegetated with these coarse grasses. Nevertheless, there are areas of open water and less dense vegetation, and it has piles of timber. The PCS is therefore likely to support the same range of plant and invertebrate species as the Eastern Survey Area. It is also likely to support Common Lizard, Meadow Pipit, Skylark, Linnet, Eurasian Marsh Harrier, Brown Hare and possibly Otter (drainage ditches). The open water is much less extensive in the PCS and therefore waterbird species such as Little Egret, Common Redshank and Eurasian Teal are much less likely to use the PCS.

2.2.10 Both vegetation surveys were undertaken at sub-optimal times of the year and the invertebrate surveys were undertaken during one season only, rather than three seasons. This means that some flowering plants and invertebrates may not have been in evidence during the surveys.

2.3 ASSESSMENT APPROACH

STAGE ONE: AA SCREENING

2.3.1 The methodology for the screening assessment follows a series of steps and is based on the data, surveys, assessments, and information described in Section 2.2 and listed in Section2.4.

2.3.2 In summary, this Stage comprises:

- Step One: ascertaining whether the Project is directly connected with or necessary to the management of a listed or proposed European or Ramsar site. Typically, this applies only to a management plan, or parts thereof, which has the purpose of maintaining or restoring the conservation interest of a European site or Ramsar site, and which would not have a negative effect on any other European site or Ramsar site.
- Step Two: identifying the relevant elements of the Project and their likely impacts, which is subdivided into:
    - Step Two, Part 1: an outline description of the Project, including construction, operation and decommissioning, containing enough information for potential impact pathways to be understood, and the Project site and its surroundings, focusing on the habitats and species that may form part of the qualifying interest of a European or Ramsar site.
    - Step Two, Part 2: an identification of the aspects of the project which have the potential to affect European or Ramsar sites, either alone or in combination with other Projects and Plans. This may include for example emissions to air and water, noise and increases in recreational activity (Sources).
- Step Three: identifying which (if any) European or Ramsar sites may be affected, considering the potential effects of the Project alone or in combination with other Projects or Plans , which is subdivided into:
    - Step Three, Part 1: generating an initial list of European and Ramsar sites to be considered in the screening process, which are those which are potentially connected (via a Pathway) to the Project site including (i) any which overlap with the Project site or are close enough to experience increased noise, vibration, light, visible human activity or invasive species; (ii) those that may have downstream connectivity via watercourses or groundwater to the Project site or transport routes; (iii) those that may receive deposition of pollutants as a result of emissions to air from the Project or associated transport routes; and (iv) those which may support migratory or mobile species populations which may also use the Project site or its environs.
    - Step Three, Part 2: compiling basic information on the European and Ramsar sites identified in Part 1, including a list of qualifying interest features (the possible Receptors), their conservation objectives, the distance and direction from the Project site (including transport routes) and how it is or is not connected, using the Source-Pathway-Receptor model, to the Project site (including transport routes). Likely significant effects can be immediately excluded for any European or Ramsar sites and any qualifying features which clearly lack a pathway or where it can be demonstrated there is a very weak pathway, such that any effects would not be appreciable.
- Step Four: assessing whether likely significant effects (LSE) on all European and Ramsar sites can be ruled out, in view of their conservation objectives.

- Step Four, Part 1: assessing LSE for the project alone, determining whether there is a risk that the project could undermine the conservation objectives for the qualifying interest features for those European and Ramsar sites for which a pathway has been identified. This is a scientific determination which considers whether the maintain or restore objective applies and both direct and indirect effects. If there is any uncertainty or detailed investigation or mitigation are required, LSE are assumed.
- Step Four, Part 2: assessing LSE for the project in combination with other Projects and Plans. Along the same lines as Part 1, this considers whether the effects of the Project, if not capable of undermining the conservation objectives on their own, could do so cumulatively with other projects and plans. It also considers whether the risk of undermining conservation objective is elevated when cumulative effects are considered.

- Conclusion: stating whether likely significant effects arising from the Project, alone and in-combination with projects and plans, on European sites can excluded, and if they cannot, which European sites and which qualifying interest features/special conservation interest are at risk from significant effects, and the relevant impact sources and pathways. If the latter, an AA will be required. The conclusion will not consider any mitigation measures designed to avoid likely significant effects on a European or Ramsar site.

STAGE TWO: APPROPRIATE ASSESSMENT

2.3.3 The methodology for the Appropriate Assessment (AA) also follows a series of steps and is also based on the data, surveys, assessments and information described in Section 2.2 and listed in Section 2.4. The AA is more detailed assessment and includes consideration of mitigation measures.

2.3.4 In summary, this Stage comprises:

- Step One: providing information on the Project and on the European and Ramsar sites which is divided into two parts.
  - Step One, Part 1: information on the project and the project site. Whilst the project has been described in outline at Stage 1, a more detailed description is provided here at Stage 2 including construction/ decommissioning methods, relevant details of the design and timescales, providing all the details needed by the competent authority to complete its AA. The description of the project site here provides further details of the habitats and species that may form part of the qualifying interest of a European site which is at risk of significant effects and its potential effects on the qualifying /special conservation interest features, considering any scoping opinion provided by the competent authority and the Statutory Nature Conservation Bodies (SNCB).
  - Step One, Part 2: information on the European and Ramsar sites, provides further information on the European and Ramsar sites identified at Stage 1, including a complete list of the qualifying interest features (if not already provided), investigation into the conservation condition and distribution of qualifying habitats and populations, a description of the site and further information on the conservation objectives, including the attributes and targets that define the conservation objectives, and the main threats and pressures. Ramsar sites do not have published conservation objectives, therefore, these are taken to be the same as those published for the same or similar species that are the qualifying interest of SPAs and SACs.

- Step Two: assessing the implications of the project in view the site's conservation objectives, individually or in combination with other plans or projects which is again divided into three parts.
    - Step Two, Part 1: assessment of the project alone. This is an impact assessment which considers how the project could affect the identified qualifying interest features.
    - Step Two, Part 2: assessment of project 'in combination', including the confirmation of the projects and plans (from Stage 1) which could act in combination with the Project. This considers whether the other Projects and Plans might exacerbate the effects of the Project alone, considering together all those Projects and Plans which affect the same European and Ramsar Sites as the Project.
    - Step Two, Part 3: assessment of the effects on the conservation objectives. An assessment of the potential of the effects of the Project, alone and in Combination with other Plans and Projects, to undermine the conservation objectives, with reference to the published attributes which define the conservation objectives, where these exist. An adverse effect on any attribute would undermine the conservation objectives for that feature and that Site.
- Step Three: ascertain the effects of the Project on the integrity of European and Ramsar sites. Following on from Step 2, it is determined that where a conservation objective could be undermined, there would be an effect on site integrity and vice versa, which is based on the published conservation objectives where these exist, or an assumed objective, as set above.
- Step Four: identify mitigation measures. For any effect that could have an adverse effect on the integrity of a European or Ramsar site, avoidance and mitigation measures are identified with the aim of removing the risk to the integrity of the identified European and Ramsar sites, including in combination effects with other projects and plans. Measures to compensate for adverse effects must not be considered at this Stage, and neither are actions designed to enhance biodiversity.
- Conclusion. Taking into account the mitigation identified at Step 4, determining whether the risk to the conservation objectives have been reduced or removed such that the conservation objectives will not be undermined, and adverse effects on the integrity of all European and Ramsar sites can be excluded.

CONSULTATION AND AMENDMENTS

2.3.5 Natural England and the RSPB have been consulted about the proposed compensation site and have provided comments. The RSPB provided comments that relate to the effects of the proposals on Orford Ness which are therefore relevant to this assessment. Other matters, such as site selection and the effectiveness of the proposed compensation are addressed elsewhere (see Section 2.4).

2.3.6 Natural England have provided comments on the Revisions A - C of this report and the accompanying Ecological Impact Assessment (EcIA). These have been responded to separately and are reproduced here for completeness.

2.3.7 Since the initial comments (prior to Deadline 4 of the Examination) were provided by the RSPB and Natural England, the position of the PCS has changed and now most of the saline lagoons recorded during the survey are outside the PCS and are located on its seaward side.

2.3.8 A further change is that need for a ditch crossing has been identified at the southern end of the PCS to allow access for the installation of the fence, annual maintenance of the fence and the management of the vegetation.

2.3.9 Vegetation and invertebrate surveys have now been undertaken on the land immediately adjacent to the PCS (but not inside due to access restrictions). The results of these surveys have now been incorporated into this HRA and the mitigation requirements have been updated accordingly.

2.3.10 Finally, the Examining Authority also requested further information in relation to Revision C of this report, which has been reflected in Revision D. In addition, the conservation objectives of the Special Protection Areas have been amended to include 'Pathogens'. This has also been addressed in Revision D.

Table 2-1: Relevant Consultation Response and where or how addressed.

Consultee	Comment	Response
RSPB	We note, overall, a lack of detailed description of the characteristics of each [compensation site] location set out in the consultation document, as well as the factors affecting the suitability of each location. Descriptions are relatively high level at this late stage in the pre-application process and c.7 months after the RIAA consultation.	A detailed description of the Initial Survey Area is provided in Section 4.1.12 onwards. This includes a representative area of the PCS.
RSPB	Suitability of the proposed compensation sites, including the assessment of their *in situ* interest is still to be determined. Further information and assessment is required on the environmental implications of the proposed measures, in terms of possible impacts on the Alde-Ore Estuary SPA and Orfordness-Shingle Street SAC, and constituent SSSIs.	As above. An assessment of the possible impacts on the Alde-Ore Estuary SPA and Orfordness-Shingle Street SAC is in Section 4.2

Consultee	Comment	Response
Natural England J4	Natural England advises that there is the potential for impacts to designated sites & features at the Lesser Black Backed Gull (LBBG) compensation site on Orford Ness**.** Natural England advises that an adequate environmental baseline for the predator exclusion fencing site on Orford Ness should be established pre-determination, to inform avoidance/mitigation measures and allow ongoing monitoring. To achieve this, seasonally appropriate baseline surveys should be carried out in summer 2024 to allow assessment of impacts to the shingle vegetation areas and invertebrates.	The Applicant is currently undertaking seasonally appropriate vegetation and invertebrate surveys on Orford Ness. The order limits for the compensation site have been refined down to a required area (6ha as agreed with NE) following further engagement with local landowners and no longer includes the artificial shingle bank close to the coastline. The surveys will be used to inform the avoidance, mitigation, monitoring and management measures that are required. In the area proposed for LBBG compensation, the shingle morphology

Consultee	Comment	Response
	Impacts to the shingle sediment morphology and structure need to be considered and assessed further. Geomorphological change trends should be assessed using historical and contemporary evidence of coastal retreat/advancement. Further consideration should be given to potential impacts to the saline lagoons within the compensation area over the lifetime of the project. As should to the potential for repeated damage caused by maintenance checks and works. Climate change impacts and coastal vulnerability also need to be adequately assessed. All the above should be factored into an updated assessment of potential impacts. Once an updated assessment has been carried out, appropriate mitigation should be applied to minimise impacts to the shingle morphology, sediment structure, vegetation and communities and similarly for the saline lagoons present in the compensation area.	appears to have already been modified as it lacks the characteristic ridges of the unmodified habitat. This area of shingle is therefore not as vulnerable to damage as other areas of Orford Ness. Moreover, there are existing tracks leading to the LBBG compensation site which can be used for access for monitoring and maintenance. It should also be noted that the works proposed (namely the installation of a fence and ongoing habitat management) are of a very minor scale and have already been approved for a neighbouring compensation site within the SAC. It is acknowledged that the Norfolk / East Anglia compensation site is not in an area containing saline lagoons, however it should be stressed that physical impacts to the saline lagoons are not expected from the Five Estuaries works. Further, the installation of fencing is prevalent in other areas of the SAC 6.8.1.3 – Lesser Black Backed Gull Ecological Impact Assessment [APP-228]). The Applicant will provide interim survey reports to NE and the ExA and provide further details of the refined 6ha compensation area in an updated Lesser Black Backed Gull Compensatory Areas Environmental Impact Assessment following Deadline 1 (Examination Library reference to be confirmed, current version is [APP-225]). Once all surveys are complete, a final version of the Lesser Black Backed Gull Compensatory Areas Environmental Impact Assessment (Examination Library reference to be confirmed) will be provided, together with supporting documents: > Lesser Black Backed Gull Habitats Regulations Assessment (Examination Library reference to be confirmed, current version is [APP-054]) > Lesser Black Backed Gull Flood Risk Assessment (Examination Library reference to be confirmed, current version is [APP-226]) > Lesser Black Backed Gull Landscape and Visual Impact Assessment (Examination Library reference to be confirmed, current version is [APP-227]) > Lesser Black Backed Gull Ecological Impact Assessment (Examination Library reference to be confirmed, current version is [APP-228])

Consultee	Comment	Response
Natural England J7	APP-045, Sec 2.2.2, 2.2.4, 4.2.6, & Table 4.2 Lesser Black Backed Gull Compensation Site at Orford Ness As stated in 2.2.4, January 2024 was outside the optimal season for habitat/botanical surveys which limits the results and support for the conclusions made regarding impacts to the proposed compensation site at Orford Ness. With Table 4.2 (Ramsar Plant Species) based on literature rather than survey data. Moreover, Section 4.2.6 acknowledges that the presence of uncommon species could not be ruled out along the proposed fence line. Natural England is therefore concerned that the potential for Orford Ness – Shingle Street Special Area of Conservation (SAC), Alde-Ore Estuary Site of Special Scientific Interest (SSSI) and Alde-Ore Estuary Ramsar site features (including rare plants or invertebrates) could be impacted by installation/removal of the predator fencing which has not been adequately quantified. In turn, this means that Natural England cannot confirm that the proposed mitigation measures will reduce potential impacts to designated site features to acceptable levels.	It is acknowledged that the survey work was undertaken in January and that assessment of impacts on uncommon plants and invertebrates was based on a desk study, so far. As noted above, the Applicant is currently undertaking vegetation and invertebrate surveys over the LBBG compensation site on Orford Ness. The SAC, SSSI and Ramsar site features will be taken into account when designing the installation/ removal and maintenance of the fence, and when determining the management requirements for the vegetation within the compensation site.
Natural England J8	APP-045 Coastal recession/advancement trends at the LBBG compensation site(s) should be adequately assessed using available evidence. Historical and contemporary geomorphological trends should be assessed to understand future site evolution in response to contemporary and future processes. This is relevant not only to site vulnerability over the lifetime of the project, but also to the sensitivities of the protected features and supporting habitats/processes. For example, at Orford Ness, the shingle habitats are likely to be highly sensitive to potential climate change impacts including sea level rise, and increased storminess, wave heights, temperatures and drought). The Applicant needs to fully consider, pre-determination, site vulnerability and sensitivities of protected features and supporting habitat/processes through the lifetime of the development. Historical and contemporary geomorphological trends	An examination of aerial photographs indicates that the seaward side of Orford Ness at the position of the LBBG compensation area has advanced seaward since 1945, while the position of the River Alde (landward side) has remained stable. The LBBG compensation area is protected on the seaward side by a very substantial (~10m in height), shingle ridge however the presence of saline lagoons indicates that sea water is able to percolate under the shingle. The greatest change that has happened in this area since 1945 is the installation of the Cobra Mist AN/FPS-95 antenna, when the shingle and saltmarsh habitat was highly modified, with the area apparently levelled and largely cleared of vegetation, and new ditches, concrete roads and fences were constructed. For these reasons the shingle habitat on the chosen site is not considered to be highly sensitive. Further, the proposed works will

Consultee	Comment	Response
	should be assessed (e.g. historical trend analysis, LiDAR surveys etc). Climate change impacts should be adequately considered.	not impact the habitat's resilience to climate change and therefore does not require an impact assessment.
Natural England J10	APP-225 Natural England advises that further consideration is needed regarding appropriate mitigation measures for impacts on the Orford Ness – Shingle Street SAC from the LBBG compensation site(s) once more a more robust baseline characterisation (and pre-determination surveys) has been undertaken. Natural England advises that mitigation measures may need to be updated following updating of baseline characterisation and survey data.	Based upon current survey and assessments, mitigation measures for impacts on Orford Ness – Shingle Street SAC have been proposed, as set out in 5.4.5 Lesser Black Backed Gull Compensation Site – Habitats Regulations Assessment [APP-045] and 6.8.1.3 Lesser Black Backed Gull Ecological Impact Assessment [APP-228]. As set out above, the Applicant is currently undertaking vegetation and invertebrate surveys over the LBBG compensation site on Orford Ness. Should these, on assessment, reveal significant effects not already identified, then additional mitigation measures will be proposed.
Natural England J11	APP-225, Sec 1.11.54-56 Natural England does not agree with the EIA conclusions for construction and management/ monitoring/ maintenance/ impacts to habitat within and adjacent to the fence line at the LBBG compensation site at Orford Ness. It is concluded that 'no significant effects are likely on perennial vegetation on coastal shingle'. Vegetated shingle communities are highly dependent upon factors relating to the sediment structure. If installation is not carried out sensitively, destabilisation of the sediment profile has the potential to cause a long-term, if not permanent, shift towards a secondary form of vegetation. Please refer to NE Ref J7 above and J12 below. Natural England advises that seasonally appropriate baseline vegetation and invertebrate surveys need to be carried out prior to determination and the impact assessment updated. Appropriate mitigation should be applied, and every effort made to avoid damage to the coastal shingle and vegetation features of the designated sites in this area.	As set out in 5.4.5 Lesser Black Backed Gull Compensation Site – Habitats Regulations Assessment [APP-045] and 6.8.1.3: Lesser Black Backed Gull Ecological Impact Assessment [APP-228], the area within the LBBG Compensation Site meets with the definition of the Annex I habitat of 'H1220 Perennial vegetation of stony banks' which is rather broad. However, the area has been disturbed (levelled) in the past, being largely flat and lacking the characteristic wave-formed shingle ridges of the unmodified habitat. This modification occurred prior to the designation of the site as an SAC apparently at the time of the construction of the construction of the Cobra Mist AN/FPS-95 antenna; aerial images from 1972 appear to show extensive vehicle tracks over the area and a lack of vegetation. The vegetation at the LBBG compensation site is now dominated by sea couch and other coarse grasses. Nevertheless, mitigation is proposed to ensure the fence is installed sensitively, with the minimum disturbance possible and where possible following lines of existing ditches and fence lines where there is evidence of past ground disturbance. Based on observations on the same site of ground previously disturbed for fence installation, the vegetation is expected to quickly recover to the same plant communities found there now. Therefore, the conclusion within the EIA is valid.

Consultee	Comment	Response
Natural England J12	APP-225 Natural England notes that the EIA does not consider impacts to the shingle morphology and sediment structure. Recoverability of damaged shingle is slow, particularly where it is more static and active geomorphological processes no longer have a major role in shaping shingle morphology. Typically, shingle morphology land ward of the seaward ridge never fully recovers. There is also the risk of further repeated damage occurring through regular maintenance/monitoring/ management of the fence line. Natural England advises that the EIA should be updated to include an assessment of impacts to the shingle morphology and sediment structure.	As set out in our response to J11, the shingle morphology (and therefore sediment structure) has been modified in the past (prior to the designation of the SAC) and is now largely flat with no prospect of recovering what may have been its original wave-formed ridge morphology. Mitigation measures included within Lesser Black Backed Gull Compensation Site – Habitats Regulations Assessment [APP-045] and Lesser Black Backed Gull Ecological Impact Assessment [APP-228] will limit damage during construction and prevent it during maintenance, monitoring and management. These measures will be secured in an updated 5.5.6 Lesser Black Backed Gull Implementation and Monitoring Plans [APP-052], which will be submitted at a later Deadline.
Natural England J13	APP-225 Natural England notes that the EIA has not considered impacts to the Saline lagoons at the Orford Ness compensation site due to the presence of the fence through the lifetime of the project in terms of blockage to overtopping events and the transfer of new shingle to their eastern edge and subsequent implications to the lagoon biodiversity. Furthermore, the impacts of climate-related changes (including water levels and coastal stability) need to be further considered. The Applicant needs to fully consider impacts to the saline lagoons over the lifetime of the project for the compensation site on Orford Ness and update the EIA, with mitigation measures brought forward and secured where a need is identified.	The fence line will avoid saline lagoons and therefore no direct impacts could occur. The saline lagoons appear to be seepage lagoons – fed by sea water percolating under the large ridge on the seaward side. Seepage is the primary recharge mechanism for the lagoons rather than direct input from over-topping or overland flow. However, a flooding event occurred in the last decade which appears to have been a result over-topping on that landward side; the Alde Estuary. Given the size of the shingle ridge, there is no possibility of wave action moving shingle from the seaward (eastern) side towards or into the lagoons, and so no process with which the fence could interfere. Changes in shingle morphology as a result of climate change etc will be assessed further, as set out in our response to J12.
Natural England J22	APP-225, Sec 4.4 Whilst Natural England considers the mitigation for vegetation maintenance for the LBBG compensation site to be broadly acceptable, we advise that best practice should be employed for maintaining vegetation community and diversity. Natural England would welcome the opportunity to discuss this further with the Applicant. Existing trackways should be used for access to the compensation site during	The management of the vegetation within the LBBG compensation site will aim to maintain vegetation communities and diversity; Natural England's input will be welcome. Existing trackways have been included in the Order Limits and will be used for access to the compensation site during construction and maintenance/ management, to minimise disturbance and further damage to affected shingle sediment and vegetation.

Consultee	Comment	Response
	construction and maintenance/ management, to minimise disturbance and further damage to affected shingle sediment, morphology and vegetation. Natural England advises that best practice should be employed for maintaining vegetation community and diversity. Further details to be provided in the Lesser Black Backed Gull Implementation and Monitoring Plan (LIMP).	
Natural England J23	App-225, Sec 4.4.6 & 4.1.9 Natural England notes that it is stated that if increased nutrients arise due to a gull colony being established (at the Orford Ness compensation site), that affect features within the site, then consideration may be given to removing cut vegetation from the compensation site and the designated site. The aim being to help reduce potential additional nutrients arising from nesting LBBG. It is also stated that this will be detailed in the LBBG IMP. However, this is laid out in the Monitoring, Management, and Maintenance section (4.1.9), as part of 'Habitat Management'. This states that it 'will comprise cutting vegetation with a strimmer and removing the arisings to create a mosaic of short and long sward heights, to create optimum nesting habitat for LBBG'. Thus, this would not be additional mitigation to compensate for nutrient increases. Natural England advises that this should be clarified. And further details should be provided in the outline LIMP.	The Applicant will clarify the approach to vegetation clearance in an updated 5.5.6 Lesser Black Backed Gull Implementation and Monitoring Plans [APP-052] submitted at Deadline 2.
Natural England J24	APP-225, Table 4.18 Natural England does not agree with the assessment conclusions for the LBBG compensation site on Orford Ness with regards to impacts to the shingle morphology due to construction/removal and maintenance of the predator exclusion fencing. It is stated that "the Project could change the shingle morphology along the fence alignment [if excavated material is not returned to its original location]." We advise that recoverability of damaged shingle is slow, particularly where it is more static and active geomorphological processes no longer have a major role in shaping the shingle morphology. In addition, machinery and plant will need to be transported from the boat landing to the site which will cause	As set out in our response to J11, the shingle morphology (and therefore sediment structure) has been modified in the past (prior to the designation of the SAC) and is now largely flat with no prospect of recovering what may have been its original wave-formed ridge morphology. The vegetation now comprises mostly dense Sea Couch, although more open vegetation exists, mostly along the spoil from ditches which were apparently dug in the 1970s. Based on observations along other fence lines, the former is likely to quickly recover, and the second is not reliant on a natural sediment mix. No undisturbed vegetated shingle communities will be affected by the works.

Consultee	Comment	Response
	compaction of the substrate and physical damage to vegetation (c. 0.13ha). Undisturbed vegetated shingle communities are dependent on a precise matrix of coarse sediment infilled with fine sediment, which in many cases have developed over long periods of time. These communities could be damaged through the installation of fence posts. Furthermore, unless conducted sensitively and in line with a mitigation strategy, vegetation control could result in a permanent loss of the Annex I habitat, whilst repeated damage is likely to occur through regular maintenance checks and works. Natural England advises that the Applicant needs to establish a more robust baseline in terms of the shingle morphology and habitats/species present at the proposed compensation site prior to determination, in order to fully consider and assess impacts to the site through installation/removal and maintenance of predator fencing, Future site evolution should also be considered fully in terms of climate change and the sensitivities of the priority habitats.	The limited construction equipment required will be brought to site by boat and existing concrete roads, included within the Order Limits, to reach the LBBG compensation site. The Annex I habitat has a broad definition and would not be lost; the quality of the habitat would not be diminished by the works except in the very short term. Mitigation measures will limit damage during construction and prevent it during maintenance, monitoring and management.
Natural England J25	APP-225, Table 4.16 Natural England is unable to agree with the HRA conclusions for coastal lagoons at Orfordness-Shingle Street SAC. The HRA has not considered whether the presence of the predator exclusion fence over the lifetime of the project could interfere with overtopping and sediment transfer processes, which may in turn alter the flora and fauna in the saline lagoons present within the compensation area for LBBG. Furthermore, climate change-related impacts (including to water level and coastal stability) need to be considered over the lifetime of the project. Natural England advises that the Applicant needs to fully consider all potential impacts to the coastal lagoons within the Orford Ness LBBG compensation site, over the lifetime of the project and the HRA should be updated accordingly.	As set out in our response to J13, the lagoons are seepage lagoons primarily recharged by seawater seeping under the large shingle ridge on the seaward (eastern side). The fence could not interfere with this process, or any other natural process supporting the lagoons. Since the impact pathway does not exist, there was no need to consider it in the HRA.

Consultee	Comment	Response
Natural England, Deadline 4 submission, NE31, NE32, NE34, NE36	**Summary Comments** **Lesser Black Backed Gull Compensation Site – Habitats Regulations Assessment (HRA) – Revision B** Natural England notes that the Applicant continues to conclude no likely significant effects despite acknowledging that baseline survey data and assessment are still required. Therefore, our concerns remain unresolved. **6.8.1 Lesser Black Backed Gull Compensatory Areas Environmental Impact Assessment – Revision B (Tracked**). Natural England advises that new areas and amended boundaries have been identified with the refined LBBG compensation area, however, baseline data are still absent for the refined area. Therefore, the Applicant needs to provide additional information to confirm their conclusions of no significant impact. Consequently, our concerns remain unresolved. **6.8.1.3 Lesser Black Backed Gull Compensation Site - Ecological Impact Assessment – Revision B (Tracked)** Natural England notes that the map on page 66 shows that more than a third of the current proposed compensation site sits outside of the original survey area. Consequently, without baseline information we are unable to adequately assess the ecological impacts. Furthermore, our earlier comments may need to be revisited, along with those issues previously considered resolved, when the necessary additional information is available. **Detailed Comments** **Revised LBBG Compensation Site HRA** This document still relies on insufficient baseline survey data owing to surveys carried out outside of an appropriate survey window. Para 2.2.5 states that updated survey results/assessments will be included in a later iteration of the HRA. Therefore, conclusions of no Likely Significant Effect	The Applicant has completed additional ecology surveys on Orford Ness which are set out in: Orford Ness Surveys Report [REP4-042] and updated the following documents: > Lesser Black Backed Gull Habitats Regulations Assessment - Revision C [REP4-007] > Lesser Black Backed Gull Compensatory Areas Environmental Impact Assessment - Revision C [REP4-013] > Lesser Black Backed Gull Ecological Impact Assessment - Revision C [REP4-015] As noted in those documents, due to access restrictions (summer storms and landowner negotiations) the data collected has limitations in terms of geography and seasonality. However, it provides good evidence of the habitats and species that have or will be found on the PCS and the results of these surveys have been in line with expectations and support the conclusions. For example, the PCS is dominated by dense coarse grasses (sea couch and/or false-oat grass) which has proved to be the least favourable habitat for scarce invertebrates. To clarify, the conclusions of the screening stage of the HRA has always been that LSE cannot be excluded and that an AA is required. The HRA report assesses the potential for adverse effects on the integrity of the European sites and concludes that, with mitigation, the published conservation objectives for the European sites, and assumed conservation objectives for the Ramsar sites, could not be undermined and therefore there would not be an adverse effect on the integrity of any European or Ramsar site. The Applicant believes there is sufficient information available to enable the competent authority to reach the same conclusion, without the need for further surveys. It would be helpful if NE could point to the conservation objective(s) it considers at risk from the works, to enable the Applicant to address this directly. To date the concern set out by Natural England appears to relate solely the carrying out of surveys for

Consultee	Comment	Response
	(LSE) are based on incomplete baseline information and are therefore not robust.	assessment and it is unclear what potential impacts from these minor works could lead to an AEoI. Additional, pre-installation surveys will be carried out. Their purpose is simply to refine the location of mitigation measures that are described in the assessments listed above. The applicant has committed to implement the mitigation measures in full.
Natural England, Deadline 4 submission, NE37	Survey Area Partial Overlap with Proposed Compensation Area Para 2.2.6 [AS-040] confirms that the boundary of the proposed LBBG compensation site has been changed. The original surveys and desk-based data collation and assessment do not cover all of the new area and are, therefore, incomplete. Consequently, the conclusions of no LSE are based on insufficient evidence. Para 2.3.8 states that a new ditch crossing will be required including a temporary bridge or permanent culvert installation to allow vehicle access. Therefore, we advise that further information will be required to assess these impacts.	This is noted by the Applicant, please see Response to NE31 and below. The area in which the ditch crossing is planned was included in the January 2024 survey area and the ditches in proximity have been surveyed. These do not support vegetation, other that algae (not seaweed), and have a limited diversity of invertebrates. On either side of the ditch is a bank, presumably formed when the ditch was excavated. The banks are shingle, the eastern being sparsely vegetated, including lichens, and the western being dense, coarse grasses. There are no pieces of timber present. The Applicant's view is that the impacts on the ecological features in this location are understood and have been adequately assessed/ described, and the proposed mitigation will ensure that the published conservation objectives for the SPA or SAC and the assumed conservation objectives for the Ramsar will not be undermined, and therefore adverse effects on site integrity can be excluded. Similarly, it is concluded that there will no likely significant effects on other important ecological features in this location. It is unclear what Natural England consider is missing from the assessment that would require further information to conclude. The Applicant's position is that this is a well understood site, with data collected from adjacent land parcel with similar vegetation communities which correspond to the citation.
Natural England, Deadline 4 submission, responses to Relevant Reps and	J4 – The Applicant states that the area does not have natural morphology and precedent from agreements around North Norfolk Compensation, hence conclusion of no LSE for shingle geomorphology. J4 - The Applicant needs to check National Coastal Erosion Risk Mapping 2 (NCERM2)	This is noted by the Applicant and NCERM2 data will be checked when available in the future.

Consultee	Comment	Response
Risk and Issues Log, NE39	data, when released, to allow further consideration of the 50-year erosion line position.	
Natural England, Deadline 4 submission, responses to Relevant Reps and Risk and Issues Log, NE40	J8 – The Applicant has assessed climate change impacts. The compensation area has been assessed as stable; no impact assessment is considered necessary. J8 - Not resolved.	As previously advised by the Applicant, a comparison of aerial imagery shows that there has been very little change of shingle morphology in the last 50 years, with vehicle tracks created in the 1970s still visible now. Moreover, the beach has been advancing eastwards in that time, providing more protection from the sea than previously. Based on this understanding, effects on the PCS arising from climate change are assessed as unlikely during the lifetime of the Wind Farm. NE43 suggests that this matter is agreed and resolved.
Natural England, Deadline 4 submission, responses to Relevant Reps and Risk and Issues Log, NE41	J11 – The Applicant considers that there is no requirement to reconsider the conclusion of no LSE for fence installation based on the assumption that the site has already been modified and the delicate matrix already impacted. However, this does not preclude the presence of rare and sensitive shingle flora and fauna associated with the SAC, and new survey data should be acquired to support this conclusion. J11 - Baseline surveys are needed to confirm current sensitivity of shingle habitats before conclusions can be agreed.	This is noted by the Applicant, please see Response to NE31 and below. No rare species of flora have been found during the surveys and most of those found along the proposed fence line are not sensitive, the exceptions being lichens which could take some time to recolonise disturbed areas. There are populations of rare invertebrates present in proximity to the PCS. These are associated with open habitats (and pieces of timber therein) rather than the dense stands of sea couch and false-oat grass which dominate the area. The proposals include mitigation to protect rare and sensitive species, and the other species would recover quickly from the disturbance as evidenced by existing fence lines within the SAC.
Natural England, Deadline 4 submission, responses to Relevant Reps and Risk and Issues Log, NE42	J12 – The Applicant states that because the morphology has already been modified, it considers that impacts of fence installation and maintenance do not need to be included in EIA. However, this will be included the implementation and monitoring plan. J12 - Resolved.	This is noted by the Applicant.
Natural England, Deadline 4 submission, responses to Relevant	J13 – The Applicant has stated that the new fence line will avoid saline lagoons. Climate change impacts have also been assessed in J8. Therefore, this issue is resolved. J13 - Resolved.	This is noted by the Applicant.

Consultee	Comment	Response
Reps and Risk and Issues Log, NE43		
Natural England, Deadline 4 submission, responses to Relevant Reps and Risk and Issues Log, NE44	J22 – The Applicant has agreed to discuss maintenance and best practice options with Natural England. J22- In progress, pending discussions.	This is noted by the Applicant.
Natural England, Deadline 4 submission, responses to Relevant Reps and Risk and Issues Log, NE45	J23 – in Para 4.4.8 [AS-040] and [REP2-013], the Applicant states that once a colony has established, if nutrients are increased, consideration may be given to removing cut vegetation from the site, which they consider sufficient additional mitigation for any increased nutrient levels. This remains part of the maintenance plan (4.1.10 [AS-040] and 6.2.3 [REP2-103]). However, we question whether this is additional mitigation? J23 - The proposed mitigation was already secured, and we do not consider it as additional. Natural England queries if this mitigation sufficient.	The Applicant has described this as 'additional mitigation' because was not included in the original project design. The need for and sufficiency of the measure will be determined by monitoring. Regardless, any increase in nutrients would be no more than that derived from the stated conservation objective to restore the gull breeding colony within the SPA.
Natural England, Deadline 4 submission, responses to Relevant Reps and Risk and Issues Log, NE46	J24 – refers to the shingle matrix and damage to the communities present. Reference is again made to the modified nature of this site, a broad definition of habitat is made, it is stated that best practice will be adopted during installation to limit damage, and Annex 1 habitat would not be lost. However, we are concerned that machinery will have to operate on the shingle habitat and there is the additional concern that this new area has not yet been surveyed. J24 - Baseline survey data is needed to confirm no LSE. Not resolved.	This is noted by the Applicant, please see Response to NE31 and below. The PCS has been partially surveyed and the remainder has been viewed while on site and from aerial imagery. The habitats along the proposed fence line are dominated by coarse grasses, especially sea couch, which can quickly recover from disturbance. Nevertheless, mitigation is proposed to limit disturbance to the shingle as much as possible, including the types of vehicles to be used. As described in Lesser Black Backed Gull Habitats Regulations Assessment – Revision C [REP4-007], the PCS can be reached using existing tracks until just before the proposed ditch crossing. Any vehicles used off the tracks will, where required, use an appropriately agreed method e.g. low ground pressure rubber tyres or tracks (not steel), such as softrak vehicle.

Consultee	Comment	Response
		The final details Of the vehicle types and routes will be set out in the final LIMP and the construction method statement for approval by the Secretary of State and LPA respectively.
Natural England, Deadline 4 submission, NE47	J25 – Natural England advised previously on the HRA that we wished the Applicant to consider fencing impacts on saline lagoons and climate change impacts/coastal stability. The Applicant has signposted to J13 and stated that saline lagoons are no longer within the fence line. J25 - Resolved – see also J13.	This is noted by the Applicant.
Natural England, Deadline 4 submission, NE48	**5.4.5 Lesser Black Backed Gull Habitats Regulations Assessment - Revision B** 4.2.3 – We note that the new fence alignment boundary runs along an existing ditch line. The manmade nature of the ditch and the excavated shingle material along the banks are considered disturbed communities. However, this disturbance dates from 1881 to 1960's, therefore recovery of shingle communities is possible. However, we advise that updated baseline surveys are required. New information regarding the alignment of the fence has been provided, therefore, Natural England needs to see and consider updated baseline data to assess conclusions. Not resolved.	This is noted by the Applicant, please see Response to NE31, NE41 and NE46.
Natural England, Deadline 4 submission, NE50	**6.8.1 Lesser Black Backed Gull Compensatory Areas Environmental Impact Assessment - Revision B** Perennial Vegetation on Coastal Shingle 1.11.55 states that stones supporting lichens will be placed to one side and replaced upright near to their original location, once the digger has finished installing the fence. This is not new but is this a feasible/robust mitigation approach? Further detail on the methodology and efficacy of the proposed mitigation is required to confirm if this is adequate mitigation for impact to lichen and other important floral species based on the updated survey results.	The lichens are generally attached to a substrate, small stones or wood, and can therefore be moved with the substrate. The lichens also occur in discrete patches not all the way along the fence line. It would be straight forward to remove and replace the lichens on their substrate before/after the fence is installed. Only common species of lichen have been identified during the survey. The mitigation is therefore feasible and adequate. No rare species of flora have been identified during the surveys and it is unclear what survey results would add to determine the efficacy of this mitigation.
Natural England, Deadline 4	Ditches	This is not agreed by the Applicant, please see Response to NE31 and NE41.

Consultee	Comment	Response
submission, NE51	1.11.65 to 1.11.68 Updated baseline information is still required to confirm the no LSE conclusion. Issue not resolved.	
Natural England, Deadline 4 submission, NE52	Increase in Nutrients Effect on Perennial Vegetation on Coastal Shingle 1.11.95 to 1.11.101 The Applicant still needs to consider, and a commitment made within the outline LBBG Implementation and Mitigation Plan (IMP) removal of arisings from vegetative maintenance and clearance of blockages in fences to remove issues around nutrient increases and flood risk. No change to our response.	This is now included in Section 5.4 of 5.5.6 LBBG Implementation and Monitoring Plan – Revision C, which was updated and submitted at Deadline 5.
Natural England, Deadline 4 submission, NE53	Climate Change Effects 1.13 Climate change effects have been assessed, including roll back of the shingle ridge. However, the site boundary has been moved further inland away from main coastal ridge so this should address impacts to the site due to climate change-related roll back of the ridge. The Applicant has concluded no significant effects are expected from climate change. The Applicant needs to check NCERM2 data when released to consider the 50- year erosion line position to confirm their conclusion is accurate.	This is noted by the Applicant, please see Response to NE31.
Natural England, Deadline 4 submission, NE54	**5.4.5 Lesser Black Backed Gull Habitats Regulations Assessment - Revision B** 2.1.1 Proposed Compensation Measures Despite noting the changes to the compensation area boundary and the incomplete surveys, 6.1.1 has still concluded no LSE or AEoI. However, seasonally appropriate baseline surveys are needed for the new compensation area, along with updating the January surveys for the rest of the site. We note [AS-040] that the final details (including location) of the new ditch crossing will be set out in the final LIMP and the construction method statement for approval by the Secretary of State and LPA respectively. New information has been provided stating that vegetation management will be outside the bird breeding season. We advise that	This is noted by the Applicant, please see Responses to NE31, NE41 and NE46 and below. It would be helpful if Natural England could elaborate on what 'potentially significant additional impacts' have been identified as the Applicant does not consider this to be the case, with only very minor updates being made.

Consultee	Comment	Response
	this needs to be for all relevant species, not just LBBG. This appears to include new information, and potentially significant additional impacts. Until the updated survey information is provided and assessed we cannot confirm if we can support a conclusion of no LSE.	
Natural England, Deadline 4 submission, NE55	**5.4.1 Habitats Regulations Assessment Site Integrity Matrices - Revision B** Orfordness-Shingle Street SAC HRA Integrity Matrices 10 and 11 are related to LBBG. However, we note that OrfordnessShingle Street SAC is not considered in the matrices (which includes shingle and coastal lagoon habitats as features). It also does not appear to have been included in previous iterations or the screening process. Similarly, vegetated shingle impacts are not considered in the matrix. This SAC was included in our Table 5.1 of our Rel Reps Cover Letter [PD2-002]. Orfordness-Shingle Street SAC should be in the matrix and screened.	This is noted by the Applicant, please see Responses to NE05. NE05: The Applicant can confirm that the Orfordness-Shingle Street SAC is considered within the HRA assessments for Five Estuaries (hereafter VE). The site is presented within the HRA Screening Report [APP-042] and in Matrix 6 of the HRA Screening Matrices [AP-043]. As presented in those documents, the site has been screened out from further consideration based on the distance to VE. On this basis, no amendments have been made. However, it should be noted that the Orfordness-Shingle Street SAC is also considered within the separate assessment considered for the Lesser Black-Backed gull compensatory measures associated with the Site [APP-045].

Consultee	Comment	Response
Natural England, Deadline 5 submission, NE03	**LBBG Proposed Compensation Site** Natural England welcomes the Applicant's 2024 vegetation and invertebrate survey report results from Orford Ness [REP4-042]. However, we note that the area covered by these surveys now lies outside (though immediately adjacent to) the revised proposed LBBG compensation area. We have also reviewed the updated LBBG Habitats Regulations Assessment [REP4-008], LBBG Compensatory Areas Environmental Impact Assessment [REP4-014], and LBBG Ecological Impact Assessment [REP4-016]. The updated LBBG HRA [REP4-008], includes results from the updated surveys. However, these were carried out adjacent to a section of the Proposed Compensation Site (PCS) but not within its boundary or adjacent to the new northern section of the PCS. The	The data gather during the desk study and surveys, including views over the parts of the PCS not visited on the ground, has enabled a thorough and systematic review of the implications of the proposed works for conservation objectives (where these exist) for each of the European and Ramsar sites concerned. It is our opinion that sufficient information has been gathered to conclude that, with mitigation, neither the proposed works nor the existence of the PCS could undermine those conservation objectives and therefore it is possible to conclude, beyond reasonable scientific doubt, there would be adverse effects on the integrity of any European or Ramsar site. As a point of clarity, we concluded that there was LSE for the Orford Ness designated sites, which is why we undertook a Stage 2 'shadow' Appropriate Assessment. This is set

Consultee	Comment	Response
	northern section of the PCS was not included in the initial surveys (January 2024) or the 'eastern' adjacent surveys (August to October 2024) (Para 2.2.8). Therefore approx. 2.3ha of the PCS have not been formally surveyed at all, including ditch systems. Furthermore, both surveys were carried out at sub-optimal times (Para 2.2.9) and are based on one visit outside the main survey window for flora and fauna. The assessments presented are based on 'inferences' from the data gathered and conclusions of LSE remain based on incomplete baseline information and are therefore not robust. Moreover, the Applicant continues to conclude no Likely Significant Effect (LSE) despite acknowledging that the new survey and assessment data is based on surveys outside of the PCS, were undertaken outside optimal survey periods, and made using 'inferences' and assumptions of the data gathered. Our previous concerns, therefore, remain unresolved.	out, we believe clearly, in the HRA report [REP4-008].
Natural England, Deadline 5 submission, NE04	In the updated LBBG EIA [REP4-014], new areas and amended boundaries have been identified but the baseline data are still absent. We advise that additional information is needed to confirm the conclusions of no significant impact. Our concerns remain unresolved. This also applies to the updated LBBG EcIA [REP4-016]. Lastly, no new information on the proposed ditch crossing has been provided in the EIA as the new survey data do not cover the area impacted.	As set out above for the HRA, we believe that sufficient information has been obtained to reach the conclusion that, with mitigation, the effects of the works and the existence of the PCS would not be significant. The area of the potential proposed ditch crossing was visited by the Applicant in January 2024. As stated in the Lesser Black Backed Gull Compensatory Areas Environmental Impact Assessment [REP4-013], any new crossing of the existing ditch required for access will be designed to maintain local hydrological regimes and avoid open shingle banks with lichen flora. To facilitate this, either a temporary bridge will be used—removable upon completion of the fence installation—or a culvert will be installed. The culvert will be covered with shingle sourced locally, ensuring it does not originate from any Annex I habitat and any new crossing will require an Ordinary Watercourse Consent application to the Lead Local Flood Authority. Therefore, no significant effects on the ditches are likely. The detailed methodology for crossing the ditch will be outlined in the final Lesser Black Backed Gull Implementation and Monitoring Plan (LIMP), which will be submitted to the

Consultee	Comment	Response
		Secretary of State and Local Planning Authority for approval.

Consultee	Comment	Response
Natural England, Deadline 6 submission	Natural England has recently discussed the requirement and timing of further onshore ecology surveys with the Applicant to complete their baseline characterisation. We have advised the Applicant that the need remains to complete this baseline characterisation to close the evidence gap and inform mitigation measures, and also that surveys should be undertaken at the optimum times of year. Whilst we appreciate the Applicant's consideration and efforts to close this evidence gap before the end of Examination, we do not feel that their proposal to carry out further surveys at sub-optimal times would sufficiently address the evidence gaps and address the concerns we have highlighted in our advice to the Examining Authority [REP5-094] and in our Risk and Issues Log (see Appendix L6 to this Deadline 6 submission). However, we note that determination for this project is not due until September 2025, and therefore it may still be beneficial for the Applicant to undertake surveys in summer 2025 to provide the necessary comfort to the Secretary of State that suitable mitigation measures can be adopted to ensure that an AEoI of the Orfordness-Shingle Street SAC is unlikely to occur from the proposed compensation activities. Alternatively, our advice is that the Secretary of State could potentially adopt a risk-based decision-making approach based on the surveys provided thus far, and secure a requirement within the DCO to carry out pre-construction surveys to validate the predictions and inferences made regarding the Orford Ness LBBG PCS HRA, EIA, and EcIA. If the pre-construction survey data indicates the need for further mitigation, then this could be agreed with the relevant SNCB and regulator prior to the commencement of any works by the Applicant. The requirement to confirm adequacy of the mitigation should also be secured within the DCO. If the Applicant agrees to this approach, commits to carrying out the	The applicant agrees to carry out additional onshore ecology surveys at the appropriate time/season, to validate the existing assessment, and will confirm the mitigation requirements or present updated mitigation proposals for the SAC/SSSI/Ramsar Site. Depending on the availability of access to the compensation site, the surveys will either be completed in summer 2025 or undertaken as pre-construction surveys. The mitigation requirements will be reviewed when the surveys are completed.

Consultee	Comment	Response
	necessary onshore ecology pre-construction surveys at the appropriate time/season, and present updated mitigation proposals for the SAC/SSSI/Ramsar Site then we would be able to support a conclusion of no adverse effect on site integrity	

Consultee	Comment	Response
Examining Authority, Report on the Implications for European Sites, Q2.2.4	Paragraph 3.2.8 of the LBBG HRA Report [APP-045] listed the potential impact pathways from the LBBG compensation works. Table 3.1 lists the European sites and qualifying features against the relevant impact pathways. The LBBG HRA Report [APP-045] assessed the potential impacts during installation of the LBBG compensation works. This included installation of predator fencing, as well as the operation and maintenance and removal (decommissioning) of the fencing. Paragraph 3.4.15 indicates that the same impact pathways were considered for the Proposed Development alone and in-combination with other projects and plans. Paragraph 3.3.9 of [APP-045] states that Minsmere-Walberswick Ramsar site and SPA shares mobile bird qualifying interest features with the Orford Ness designated sites (AOE Ramsar site and SPA), which may be linked populations. The Applicant states that LSE to the Minsmere-Walberswick sites could not be excluded as this relies on an assessment of the Orford Ness sites to determine no AEOI to those populations first. Question: Confirm which effect pathways were considered for potential LSE to the Minsmere-Walberswick sites, as Table 3.1 of [APP-045] identifies only one pathway (disturbance during construction and maintenance) but for the Alde-Ore Estuary sites several more pathways were identified for the same bird qualifying features.	All the potential impact factors listed in 3.2.8 (now 3.2.11) were considered, with disturbance during construction and maintenance being the most plausible and therefore stated in the table. The over-arching consideration is that if there is no AEOI at the Orford Ness designated sites by any pathway then there could be no AEOI on the Minsmere-Walberswick sites, as it is only by adverse effects on the populations at Orford Ness that the populations at Minsmere-Walberswick could be adversely affected by the project. The assumption that the populations are linked is precautionary. As requested, the screening and integrity matrices and the report will be updated to make this more clear.
Examining Authority, Report on the Implications for European Sites, Q3.2.1	The Applicant's LBBG HRA Report [APP-045] concludes that the Proposed Development would not adversely affect the integrity of any of the European sites and features assessed, either alone or in combination with other projects or plans.	The Applicant's conclusion at paragraph 4.5.1 in 5.4.5 Lesser Black Backed Gull Habitats Regulations Assessment – Revision C [REP4-007] (with emphasis added) was: *With the implementation of the mitigation set out in Section 4.4, it can be ascertained,*

Consultee	Comment	Response
	For the Minsmere-Walberswick Ramsar site (marsh harrier and avocet) and SPA (marsh harrier, little tern and avocet), paragraph 3.5.4 of the LBBG HRA [APP-045] states that these would only be subject to detailed assessment if it was concluded that AEoI could not be excluded following mitigation to the equivalent bird qualifying features of the AOE Ramsar site and SPA. [APP-045] concludes no AEoI in this regard subject to the implementation of mitigation (section 4.5) so no detailed assessment of the Minsmere-Walberswick was presented. Question: It is concluded in the LBBG HRA that there would be the potential for an LSE at Minsmere-Walberswick Ramsar and SPA. Can the Applicant signpost the ExA to its assessment of AEoI for these sites. An update to [APP-045] is requested to clarify the conclusions in this regard.	*beyond reasonable doubt, that the Project would not have an adverse effect on the integrity of the following* ***or any other*** *European and Ramsar sites: Alde-Ore Estuary Ramsar (UK11002); Alde-Ore Estuary SPA (UK9009112); Orfordness – Shingle Street SAC (UK0014780); Alde-Ore & Butley Estuaries SAC (UK0030076)* This presented our conclusions for the Minsmere-Walberswick Ramsar and SPA. An additional paragraph has been added to the LBBG HRA [APP-045] Revision D to confirm this is the case.
Examining Authority, Report on the Implications for European Sites, Q3.2.2	The Applicant has presented screening and integrity matrices to accompany the RIAA (see [REP5-011] and [REP2-004] respectively) but has not provided equivalent matrices for the LBBG HRA. Question: The Applicant is requested to provide screening and integrity matrices for the designated sites assessed in the LBBG HRA. Given that some sites are included within the scope of both HRA reports, the Applicant is requested to provide a single matrix to holistically capture the impacts from the Proposed Development in its entirety.	The screening and integrity matrices have been updated at Deadline 7 to include the potential impacts of the LBBG compensation measure at Orford Ness. Due to the differing range of impacts between the main development and the proposed compensation site, it has not been possible to present them as a single matrix per site.

2.4 SOURCES OF INFORMATION

FOR THE PROJECT ALONE

DESK STUDY

- Information Sheet on Ramsar Wetlands: Alde-Ore Estuary Ramsar.
- Natural England Conservation Advice for Marine Protected Areas: Alde-Ore Estuary SPA.
- Natural England Conservation Advice for Marine Protected Areas: Orfordness - Shingle Street SAC.
- Natural England Conservation Advice for Marine Protected Areas: Outer Thames Estuary SPA

- Natural England Conservation Advice for Marine Protected Areas: Alde, Ore and Butley Estuaries SAC.
- JNCC website: Southern North Sea MPA
- Natural England Conservation Advice for Terrestrial Protected Areas: Sandlings SPA
- Natural England Conservation Advice for Terrestrial Protected Areas: Staverton Park & The Thicks, Wantisden SAC
- Information Sheet on Ramsar Wetlands: Minsmere-Walberswick Ramsar.
- Natural England Conservation Advice for Marine Protected Areas: Minsmere-Walberswick SPA.
- Site Improvement Plan Alde-Ore Estuaries.
- British Trust for Ornithology Wetland Bird Survey Online Reports.
- Suffolk Bird Report.
- Ecological data obtained from the Suffolk Biodiversity Information Service.

SURVEYS & ASSESSMENTS

- Five Estuaries Offshore Wind Farm EIA Volume 6, Part 8, Report 1.1: Lesser Black Back Gull Compensation Site - Ecological Impact Assessment.
- Five Estuaries Offshore Wind Farm Volume 5, Report 5.9: Lesser Black-Backed Gull Compensation Site Suitability Report.
- Five Estuaries Offshore Wind Farm Environmental Statement Volume 5, Report 5.6: Lesser Black-Backed Gull Implementation and Monitoring Plan.
- Five Estuaries Offshore Wind Farm Environmental Statement Volume 5, Report 5: Habitats Regulations Assessment 'Without Prejudice' Derogation Case.
- Five Estuaries Offshore Wind Farm Environmental Statement Volume 5, Report 5.3 Lesser Black-Backed Gull Compensation – Evidence, Site Selection & Roadmap.
- SLR Five Estuaries Offshore Wind Farm, Lesser Black-backed Gull Compensation Site: 2024 Vegetation & Invertebrate Survey Report.

LEGISLATION

- The Conservation of Habitats and Species Regulations 2017, as amended.

GUIDANCE DOCUMENTS

- Defra guidance Habitats Regulations Assessments: Protecting a European Site[2].

FOR THE PROJECT 'IN COMBINATION'

PROJECTS

- Norfolk Projects Offshore Wind Farms Norfolk Projects HRA Lesser Black Backed Gull Compensation at the Alde-Ore Estuary: Fence Construction and Maintenance, completed by Royal Haskoning
- East Suffolk Council Project Level Habitats Regulations Assessment Record for Norfolk Vanguard and Norfolk Boreas Offshore Wind Farms (collectively known as the Norfolk Projects).

[2] https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site

PLANS

- East Suffolk Council - Suffolk Coastal Local Plan (Adopted September 2020)
- Site Improvement Plan Alde-Ore Estuaries

3 STAGE ONE: SCREENING

3.1 STEP ONE: MANAGEMENT OF ANY EUROPEAN SITE

3.1.1 The project is compensation for predicted effects on the Lesser Black-Backed Gull population and therefore not directly connected with, or necessary for the management, of any listed or proposed European or Ramsar site. i.e. it is not management plan with aim of furthering the conservation objectives of such a site.

3.2 STEP TWO: PROJECT DESCRIPTION & IMPACT FACTORS

STEP TWO, PART 1: PROJECT DESCRIPTION

THE PROJECT

3.2.1 The Project is the installation of a predator-proof fencing on a site at Orford Ness as compensation for predicted effects on the Lesser Black-backed Gull qualifying interest feature of the Alde-Ore Estuary SPA. This compensation is in connection with the development of the Five Estuaries Offshore Wind Farm. The predator-proof fence will be installed by a team of people using light machinery. It will be partially dug into the ground. The works to install the fence are expected to take two to three weeks. The fence will be in place for the operational life of the wind farm. Inspections, routine maintenance, and repair of the fence will take place during this time. At the end of the operational lifetime of the wind farm, the fencing will either be removed (with approval from the Secretary of State) or maintained either by the Applicant or a third party. Access will be primarily along existing tracks however a ditch crossing point will be required for vehicle access to the PCS.

THE PROJECT SITE

ECOLOGICAL CONNECTIONS SUMMARY

3.2.2 The PCS lies within an area with the following designations:

- Alde-Ore Estuary Ramsar (UK11002)
- Alde-Ore Estuary SPA (UK9009112); and
- Orfordness - Shingle Street SAC (UK0014780)

The Alde-Ore & Butley Estuaries SAC (UK0030076) is adjacent and may be connected hydrologically to the PCS.

HABITATS (ANNEX I) SUMMARY

3.2.3 The PCS includes the following Annex I habitats:

- H1150 Coastal lagoons*
- H1220 Perennial vegetation of stony banks

3.2.4 Ditches are also present.

SPECIES (ANNEX I BIRDS, ANNEX II OTHERS & RAMSAR) SUMMARY

3.2.5 The PCS supports Common Redshank *Tringa totanus* and Eurasian Marsh Harrier *Circus aeruginosus*, both of which were observed during the survey. The saline lagoons nearby (within the Initial Survey Area) provide suitable habitat for foraging (Eurasian) Teal *Anas crecca*, which was recorded during the surveys, (Pied) Avocet *Recurvirostra avosetta*, Common Greenshank *Tringa nebularia*, Spotted Redshank *Tringa erythropus* and, possibly, Little Tern *Sternula albifrons*.

3.2.6 The PCS potentially provides habitat for several Red Data Book plant species including:

- Bur Meddick *Medicago minima*
- Curved Hard-grass *Parapholis incurva*
- Perennial Glasswort *Sarcocornia perennis*
- Suffocated Clover *Trifolium suffocatum*
- Rough Clover *Trifolium scabrum*
- Yellow-vetch *Vicia lutea*

3.2.7 However, none were recorded during surveys of the Initial and Eastern Survey Areas.

3.2.8 The PCS potentially provides habitat for several Red Data Book invertebrates including:

- Shingle Yellow-face Bee *Hylaeus euryscapu* syn *Hylaeus annularis*
- The spider *Haplodrassus minor*
- The spider *Trichoncus affinis*

3.2.9 The saline lagoons nearby (within the Eastern Survey Area) may provide habitat for Red Data Book invertebrates including:

- Starlet Sea Anemone *Nematolstella vectensis*
- Lagoon Sand Shrimp *Gammarus insnensibili*

3.2.10 None of these species were recorded during the surveys. Only one species listed on the Ramsar citation was recorded during the surveys of the Eastern Survey Area, which was the jumping spider *Pseudeuophrys obsoleta*. However, twelve other species which are nationally scarce or nationally rare were recorded during the surveys.

STEP TWO, PART 2: POTENTIAL IMPACT FACTORS

3.2.11 The ways in which the Project could give rise to effects on European and Ramsar sites and their qualifying interest features, could include:

- Factor 1: Damage to qualifying interest habitats or the habitats of qualifying interest features, including topography, during fence installation, maintenance and removal, during the installation of a ditch crossing, and during the management of vegetation.
- Factor 2: Direct mortality of qualifying interest animals and plants during fence installation, maintenance and removal, during the installation of a ditch crossing, and when undertaking management of vegetation.

- Factor 3: Disturbance of qualifying interest birds due to the presence of workers during fence installation, maintenance and removal, during the installation of a ditch crossing, and when undertaking management of vegetation .
- Factor 4: Release of suspended solids and other pollution into waterways during fence installation, maintenance and removal, during the installation of a ditch crossing, and when undertaking management of vegetation.
- Factor 5: Spread of non-native invasive species and pathogens by bringing these on to site on construction and maintenance machinery and materials and workers clothing.
- Factor 6: Removal of gazing animals (Chinese Water Deer and Brown Hare) from the PCS, affecting vegetation composition.
- Factor 7: Increases in nutrients from bird faeces affecting vegetation composition and water quality.
- Factor 8: Changes in water flows caused by fence lines across ditches.

3.3 STEP THREE: IDENTIFICATION OF EUROPEAN & RAMSAR SITES

STEP THREE, PART 1: INITIAL LIST OF EUROPEAN & RAMSAR SITES

3.3.1 An initial list of European sites for consideration, comprising those which are in an arbitrary search area of 15km. This list is provided in the first column of Table 3-1.

STEP THREE, PART 2: BASIC INFORMATION ON EUROPEAN & RAMSAR SITES

3.3.2 Basic information on the European and Ramsar sites identified is provided in columns 2 and 3 of Table 3-1.

Table 3-1 European Sites Initially considered for Source – Pathway – Receptor links

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
Alde-Ore Estuary Ramsar (UK11002)	The Alde-Ore Estuary Ramsar comprises the estuaries of the Rivers Alde, Butley and Ore, including Havergate Island and the shingle spit of Orford Ness. It is 2534ha in size, The qualifying interest of the Ramsar are: **Plants:** Marsh mallow *Althaea officinalis* Sea Heath *Frankania laevis* Sea Pea *Lathyrus japonicus* Dittander *Lepidum latifolium* Bur Meddick *Medicago minima* Curved Hard-grass *Parapholis incurve* Borrer's Saltmarsh Grass *Puccinellia fasciuculata* Spiral Tasselweed *Ruppia cirrhosa* Perennial Glasswort *Sarcocornia perennis*	0m, 100% overlap	Yes. **Source 1: Construction, Maintenance & Decommissioning Activity** Pathway 1: Habitat damage (Factor 1) Possible receptors: Bur Meddick, Curved Hard-grass, Perennial Glasswort, Suffocated clover, Yellow-vetch, Shingle Yellow-face Bee, *Haplodrassus minor*, *Trichoncus affinis*, Lesser Black-backed Gull (breeding), Pied Avocet (breeding & non-breeding), Common Greenshank (non-breeding), Common Redshank (non-breeding), Black-tailed Godwit (non-breeding), Common Shelduck (non-breeding), Northern Shoveler (non-breeding), Spotted redshank (non-breeding), Common Redshank (non-breeding) and Eurasian Teal (non-breeding). Pathway2: Mortality (Factor 2)	Yes

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	Marsh Sowthistle *Sonchus palustris* Suffocated Clover *Trifolium suffocatum* Yellow-vetch *Vicia lutea* Narrow-leaved Eelgrass *Zostera angustifolia* **Invertebrates:** Ground Lackey *Malacosoma castrensis* Fancy-legged Fly *Campsicnemus magius* *Cheilosia velutina* a hoverfly *Empis prodomus* a fly *Dixella attica* a fly *Shingle* Yellow-face Bee *Hylaeus euryscapu* *Pseudamnicola confuse* a snail Starlet Sea Anemone *Nematolstella vectensis* Lagoon Sand Shrimp *Gammarus insnensibili*		Bur Meddick, Curved Hard-grass, Perennial Glasswort, Suffocated clover, Yellow-vetch, Shingle Yellow-face Bee, *Haplodrassus minor*, *Trichoncus affinis*, Lesser Black-backed Gull (breeding) and Pied Avocet (breeding). Pathway 3: Disturbance (Factor 3) Possible Receptors: Little Tern (breeding), Eurasian Marsh Harrier (breeding), Lesser Black-backed Gull (breeding), Pied Avocet (breeding & non-breeding), Common Greenshank (non-breeding), Common Redshank (non-breeding), Black-tailed Godwit (non-breeding), Common Shelduck (non-breeding), Northern Shoveler (non-breeding), Spotted Redshank (non-breeding), Common Redshank (non-breeding) and Eurasian Teal (non-breeding). Pathway 4: Aquatic pollution (Factor 4) Possible receptors: Starlet sea anemone, Lagoon sand shrimp, Little Tern (breeding), Lesser Black-backed Gull (breeding), Pied Avocet (breeding	

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	Euophrys browning a jumping spider Duffy's Bell-headed Spider *Baryphyma duffeyi* *Haplodrassus minor a spider* *Trichoncus affinis a spider* **Birds – Breeding:** Lesser Black-backed Gull *Larus fuscus* Pied Avocet *Recurvirostra avosetta** Little Tern *Sternula albifrons* Sandwich Tern *Thalasseus sandvicensis* Mediterranean Gull *Larus melanocephalus*** Eurasian Marsh Harrier *Circus aeruginosus* **Birds - Non-breeding:** Pied Avocet *Recurvirostra avosetta* Common Redshank *Tringa totanus* Common Greenshank *Tringa nebularia*		& non-breeding), Common Greenshank (non-breeding), Common Redshank (non-breeding), Black-tailed Godwit (non-breeding), Common Shelduck (non-breeding), Northern Shoveler (non-breeding), Spotted Redshank (non-breeding), Common Redshank (non-breeding) and Eurasian Teal (non-breeding). Pathway 5: Introduction of INNS and pathogens (Factor 5) Possible receptors: all listed plants and invertebrates and all listed bird species. **Source 2: Presence of exclusion fence** Pathway 1: Removal of Grazing (Factor 6) Possible receptors: the same plants, animals and birds listed for Pathway 1. Pathway 2: Increase in nutrients from nesting gulls (Factor 7). Possible receptors: the same plants and invertebrates listed for Pathway 1	

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	Black-tailed Godwit *Limosa limosa islandica* Common Shelduck *Taodorna tadorna* Northern Shoveler *Anas clypeata* Northern Pintail *Anas acuta*** Spotted Redshank *Tringa erythropus* Eurasian Teal *Anas crecca* Greater White-fronted Goose *Anser albifrons albifrons* Eurasian Wigeon *Anas Penelope* NB there are two lists of 'Noteworthy' birds for this site, one produced in 1999 and the other in 2008, the above list is an amalgamation. Those only on the 1999 list are marked with an * and those only on the 2008 list are marked with a **. There are no published conservation objectives (COs) for the Ramsar site.		plus Starlet Sea Anemone, Lagoon Sand Shrimp, and the same birds. Pathway 3: Changes in hydrology causing habitat damage (Factor 8) Possible receptors: the same plants and invertebrates listed for Pathway 1 plus Starlet Sea Anemone, Lagoon Sand Shrimp, and the same birds.	
Alde-Ore Estuary SPA (UK9009112)	The Alde-Ore SPA 2403.63 ha has the same boundary as the Ramsar except the SPA excludes the southern	0m, 100% overlap	Yes. **Source 1: Construction, Maintenance & Decommissioning Activity**	Yes

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	6.8km of the Ordfordness shingle spit (130.4ha). **Breeding:** A132 Pied Avocet A183 Lesser Black-backed Gull A195 Little Tern A191 Sandwich Tern A081 Eurasian Marsh Harrier **Non-breeding:** A132Pied Avocet A162 Common Redshank A151 Ruff *Calidris pugnax* The conservation objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring: > the extent and distribution of the habitats of the qualifying features		Pathway 1: Habitat damage (Factor 1) Possible receptors: Pied Avocet (breeding and non-breeding), Lesser Black-backed Gull (breeding), Common Redshank (non-breeding) and Ruff (non-breeding). Pathway2: Mortality (Factor 2) Possible receptors: Pied Avocet (breeding) and Lesser Black-backed Gull (breeding). Pathway3: Disturbance (Factor 3) Possible receptors: Pied Avocet (breeding and non-breeding), Little Tern (Breeding), Lesser Black-backed gull (breeding), Eurasian Marsh Harrier (breeding), Common Redshank (non-breeding) and Ruff (non-breeding). Pathway 4: Aquatic pollution (Factor 4) Possible Receptors: Pied Avocet (breeding and non-breeding), Little Tern (Breeding), Lesser Black-backed Gull (breeding), Common Redshank (non-breeding) and Ruff (non-breeding).	

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	> the structure and function of the habitats of the qualifying features > the supporting processes on which the habitats of the qualifying features rely > the populations of each of the qualifying features > the distribution of qualifying features within the site		Pathway 5: Introduction of INNS and pathogens (Factor 5) Possible Receptors: all bird species listed. **Source 2: Presence of exclusion fence** Pathway 1: Changes in water quality (Factor 4) Possible receptors: Pied Avocet (breeding and non-breeding), Lesser black-backed gull (breeding), Common Redshank (non-breeding) and Ruff (non-breeding). Pathway 2: Changes in vegetation (Factor 6) Possible receptors: Pied Avocet (breeding and non-breeding), Lesser black-backed gull (breeding), Eurasian Marsh Harrier (breeding), Common Redshank (non-breeding) and Ruff (non-breeding). Pathway 3: Changes in hydrology causing habitat damage (Factor 8)	

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
			Possible receptors: Pied Avocet (breeding and non-breeding), Lesser Black-backed Gull (breeding), Eurasian Marsh Harrier (breeding), Common Redshank (non-breeding) and Ruff (non-breeding).	
Orfordness - Shingle Street SAC (UK0014780)	Orfordness - Shingle Street SAC encompasses the whole shingle spit 888.01 ha. The qualifying interest features are: 1150 Coastal lagoons* (Priority feature) 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks The conservation objectives are to ensure that the integrity of the site is maintained or restored as appropriate, and to ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; > The extent and distribution of qualifying natural habitats	0m, 100% overlap	Yes. **Source 1: Construction, Maintenance & Decommissioning Activity** Pathway 1: Habitat damage (Factor 1) Possible Receptors: 1150 Coastal lagoons* (Priority feature), 1220 Perennial vegetation of stony banks Pathway 2: Changes in water quality (Factor 4) Possible Receptors: 1150 Coastal lagoons* (Priority feature Pathway 3: Introduction of INNS and pathogens (Factor 5) Possible receptors: all qualifying habitats.	Yes

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	> The structure and function (including typical species) of qualifying natural habitats, and > The supporting processes on which qualifying natural habitats rely		**Source 2: Presence of exclusion fence** Pathway 1: Removal of grazing causing changes in vegetation (Factor 6) Possible Receptors: 1150 Coastal lagoons* (Priority feature), 1220 Perennial vegetation of stony banks Pathway 2: Increase in nutrients causing changes in vegetation and water quality (Factor 7). Possible Receptors: 1150 Coastal lagoons* (Priority feature), 1220 Perennial vegetation of stony banks Pathway 3: Changes in hydrology (Factor 8) Possible Receptors: 1150 Coastal lagoons* (Priority feature), 1220 Perennial vegetation of stony banks.	
Outer Thames Estuary SPA (UK9020309)	A very large area of the sea 392,451.66 ha to protect wintering red-throated diver and the feeding habitat of two tern species from speficv breeding colonies. The qualifying interest features are:	72.4m east	The named tern colonies on the SPA citation do not include any at Orford Ness, and the divers are entirely marine, so there are no ecological pathways, and the SPA is so large the	No

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	A001 Red-throated Diver *Gavia stellata* (Non-breeding) A195 Common Tern *Sterna hirundo* (Breeding) A193 Little Tern (Breeding) Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; > The extent and distribution of the habitats of the qualifying features > The structure and function of the habitats of the qualifying features > The supporting processes on which the habitats of the qualifying features rely > The population of each of the qualifying features, and, > The distribution of the qualifying features within the site		pathways for aquatic pollution are so weak they can be discounted.	
Alde-Ore & Butley Estuaries	Alde-Ore & Butley Estuaries SAC comprises the estuaries of the Rivers	0m, west (adjacent	Only a weak connection along access route.	Yes

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
SAC (UK0030076)	Alde, Butley and Ore (1632.72 ha), and adjoins the Orfordness - Shingle Street SAC. The two SACs combined cover approximately the same area as the Alde-Ore Estuary Ramsar. The qualifying interest features are: 1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) The conservation objectives are to ensure that the integrity of the site is maintained or restored as appropriate, and to ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; > The extent and distribution of qualifying natural habitats > The structure and function (including typical species) of qualifying natural habitats, and	to access track)	**Source 1: Construction, Maintenance & Decommissioning Activity** Pathway 1: Release of suspended solids into surface water which drains into the estuary (Factor 4) Possible receptors: 1130 Estuaries, 1140 Mudflats and sandflats not covered by seawater at low tide. Pathway 2: Introduction of INNS and pathogens (Factor 5) Possible receptors: all qualifying habitats. **Source 2: Presence of exclusion fence** Pathway 1: Increase in nutrients from nesting gulls (Factor 7). Possible receptors: 1130 Estuaries, 1140 Mudflats and sandflats not covered by seawater at low tide.	

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	> The supporting processes on which qualifying natural habitats rely			
Southern North Sea SAC UK0030395	Very large area of marine habitat 3,698,885.14 ha with one Qualifying Interest feature: 1351 Harbour Porpoise *Phocoena Phocoena* The conservation objectives are to ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters in the context of natural change, this will be achieved by ensuring that: 1. Harbour porpoise is a viable component of the site; 2. There is no significant disturbance of the species; and 3. The condition of supporting habitats and processes, and the availability of prey is maintained.	2,809m, north	No ecological connections and, although the surface water from the PCS will ultimately enter the North Sea, this is a very weak impact pathway and due to the scale of the works can be discounted.	No.

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
Sandlings SPA UK9020286	Lowland heathland, acid grassland and forestry plantations on sandy soils which once supported extensive heathland; 3408.37ha A224 European nightjar *Caprimulgus europaeus* (Breeding) A246 Woodlark *Lullula arborea* (Breeding) The conservation objectives are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring; > The extent and distribution of the habitats of the qualifying features > The structure and function of the habitats of the qualifying features > The supporting processes on which the habitats of the qualifying features rely > The population of each of the qualifying features, and,	2,620m, west	There are no ecological or hydrological connections between this SPA and the PCS. The qualifying interest bird species are heathland species which do not breed at Orford Ness.	No

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	> The distribution of the qualifying features within the site			
Staverton Park & The Thicks Wantisden SAC UK0012741	Woodland, 80.83ha, 9190 Old acidophilous oak woods with *Quercus robur* on sandy plains The conservation objectives are to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; > The extent and distribution of qualifying natural habitats > The structure and function (including typical species) of qualifying natural habitats, and > The supporting processes on which qualifying natural habitats rely	6,491m west	No ecological or hydrological connections. The qualifying habitat type does not occur within the PCS or at Orford Ness.	No
Minsmere - Walberswick Ramsar UK11044	A mosaic of marine, freshwater, marshland and associated habitats, complete with transition areas in between. Contains the largest continuous stand of reedbeds in	13,065m	For there to be an effect, on a QI population at Minsmere -Walberswick there must first be an effect at the Alde-	Yes

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	England and Wales and rare transition in grazing marsh ditch plants from brackish to fresh water. 1995.84ha Nine nationally scarce plants and at least 26 red data book invertebrates. An important assemblage of rare breeding birds associated with marshland and reedbeds including: Great bittern *Botaurus stellaris* Gadwall *Anas strepera* Eurasian Teal Northern Shoveler Eurasian Marsh Harrier Pied Avocet Bearded Tit *Panurus biarmicus.* There are no published conservation objectives (COs) for the Ramsar site.		Ore Estuary and the populations must exchange individuals between the two sites. **Source 1: Construction, Maintenance & Decommissioning Activity** Pathway 1: Mortality (Factor 2) Possible receptors: Pied Avocet (breeding) Pathway 2: Disturbance (Factor 3) Possible Receptors: Great Bittern, Gadwall, Eurasian Teal, Northern Shoveler, Eurasian Marsh Harrier, Pied Avocet and Bearded Tit (all breeding). These two pathways are the only possible direct pathways, where the impact could directly affect birds breeding at Minsmere -Walberswick Ramsar should these same birds also occur Orford Ness. These pathways and the others identified for Alde-Ore Estuary Ramsar and SPA (damage to habitats, aquatic pollution, spread of INNS, etc.) could also affect the breeding birds at	

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
			Minsmere -Walberswick Ramsar indirectly should the same birds also use Orford Ness or the populations are linked. However, there is no possibility for the works to directly affect the habitats at Minsmere -Walberswick Ramsar.	
Minsmere-Walberswick SPA UK9009101	See description for Ramsar site. 1997.67ha. Breeding: A052 Eurasian Teal A021 Great Bittern A081 Eurasian Marsh Harrier A224 European Nightjar *Caprimulgus europaeus*: A056 Northern Shoveler A051 Gadwall A132 Pied Avocet A195 Little Tern Non-breeding:	13,065m	As for the Minsmere-Walberswick Ramsar site, but including Little Tern and Eurasian Hen Harrier (the habitat at Orford Ness is not suitable for nightjar)	Yes

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
	A082 Hen Harrier *Circus cyaneus* A056 Northern Shoveler A051Gadwall A394 Greater white-fronted goose The conservation objectives are to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring: > the extent and distribution of the habitats of the qualifying features > the structure and function of the habitats of the qualifying features > the supporting processes on which the habitats of the qualifying features rely > the populations of each of the qualifying features > the distribution of qualifying features within the site			

Site and Code	Brief Description, Qualifying Interest and Conservation Objectives	Distance from Project	Potential Connections (Source-Pathway-Receptor)	Considered further in screening Y/N
Minsmere to Walberswick Heaths & Marshes SAC UK0012809	See description for Ramsar site. 1238.25ha. 1210 Annual vegetation of drift lines 1220 Perennial vegetation of stony banks 4030 European dry heaths Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring; > The extent and distribution of qualifying natural habitats and habitats > The structure and function (including typical species) of qualifying natural habitats, and > The supporting processes on which qualifying natural habitats rely	13,065m	Shares two qualifying interest features with Orfordness - Shingle Street SAC however too distant to have anything but a very weak connection through occasional exchange of plants by seed dispersal (air or sea).	No

3.3.3 Potential Impact Pathways are identified in Column 4 in Table 3-1.

3.3.4 For five of the designated sites listed in Table 3-1, no or a very weak pathway was identified. These are:

- Outer Thames Estuary SPA UK9020309
- Southern North Sea SAC UK0030395
- Sandlings SPA UK9020286
- Staverton Park & The Thicks Wantisden SAC UK0012741
- Minsmere to Walberswick Heaths & Marshes SAC UK0012809

3.3.5 The PCS shares a qualifying interest feature with the Outer Thames Estuary SPA; Little Tern however the (former) Little Tern Colony is at Orford Ness is not listed on the citation for the Outer Thames Estuary SPA and therefore the Orford Ness colony is not relevant to the Conservation Objectives of this SPA.

3.3.6 The PCS is hydrologically linked to the Outer Thames Estuary SPA and the Southern North Sea SAC but the very small scale of the works relative to the size and nature of the SPA and SAC means that there is no risk of undermining the conservation objectives of the SPA and SAC via water pollution.

3.3.7 The PCS is on Orford Ness which (i) is separated from the inland sites listed in Table 3-1 by the Alde-Ore Estuary, (ii) comprises a rare type of coastal habitat with distinct plant and invertebrate communities, and (iii) has qualifying interest bird species are wetland or coastal species.

3.3.8 Sandlings SPA and the Staverton Park & The Thicks Wantisden SAC are both more than 3km inland and do not share qualifying interest features with the designated sites at Orford Ness. Therefore, there is no hydrological or ecological link between the PCS and Staverton Park & The Thicks Wantisden SAC and no risk that the Project could undermine the conservation objectives for the Sandlings SPA and Staverton Park & The Thicks Wantisden SAC.

3.3.9 Minsmere-Walberswick Ramsar and SPA share qualifying interest features with the Orford Ness designated sites which are all mobile species of birds and may be linked populations in some way. In addition, the other qualifying interest bird species of Minsmere-Walberswick Ramsar and SPA may also use the Orford Ness sites, excpt European Nightjar which is a heathland specialist. For there to be an effect on the populations of the listed birds at Minsmere, there must first be an effect at the Orford Ness designated sites. So, while it is not possible to exclude effects that could undermine the conservation objectives Minsmere-Walberswick Ramsar and SPA at this stage, detailed assessment is only necessary if adverse effects on the these birds at Orford Ness cannot be excluded. Minsmere-Walberswick SAC also shares qualifying interest features with the Orford Ness designated sites however these are habitats with only a very weak connection due to the distance between these sites.

3.4 STEP FOUR: LIKELY SIGNIFICANT EFFECTS

STEP FOUR, PART 1: FOR THE PROJECT ALONE

ALDE-ORE ESTUARY RAMSAR (UK11002)

3.4.1 There are no published conservation objectives for the Ramsar features. For those features which are also the same as the Alde-Ore SPA, the conservation objectives are assumed to be the same. For the others, it is assumed that the conservation objectives are the same as for a bird species which is a qualifying interest feature of an SPA or the same as Annex II species which is a qualifying interest feature of an SAC.

3.4.2 The breeding colonies for Lesser Black-backed Gull at Orford Ness are at Havergate Island and Lantern Marshes (although birds may also nest elsewhere occasionally) (Davis, et al., 2018). At their closest point, these are c. 3.9km and 0.3km from the PCS respectively, and neither is alongside the access route from Orford. Although birds may be present occasionally, the PCS does not provide good foraging habitat for this species, hydrological links between the PCS and these areas are very weak and, given the distances, there is no scope for works undertaken at the PCS to disturb birds nesting at the two colonies. Moreover, the PCS is designed to provide a benefit for this species. However, this species could be affected by maintenance and decommissioning the fence as the aim is to create suitable nesting habitat for this species at the PCS.

3.4.3 The Sandwich Tern colony at Orford Ness was on Havergate Island but it was more or less abandoned in 1997, with nesting occurring only in some years with a maximum of 15 pairs in 2003. Given the location of the colony on Havergate Island, the works at the PCS could not hinder any efforts to restore the colony, other than through the spread of invasive non-native species of plants and pathogens. Similarly, there are no recent records of breeding Mediterranean Gull at Orford Ness; it normally nests in Black-Headed Gull colonies; this species has nested at Kings, Lantern and Havergate Marshes at Orford Ness in recent years.

3.4.4 The habitat within the PCS includes ditches and small saline lagoons however these are shallow and support mainly annual vegetation which is not green in winter. Therefore, the ditches and lagoons are not suitable habitat for Eurasian Wigeon and Greater White-fronted Goose which require green vegetation for foraging in winter and prefer deep, open water for roosting. The works at the PCS would therefore not affect these two species.

3.4.5 As set out in Table 3-1, the PCS is within the Alde-Ore Estuary Ramsar and has hydrological connections via surface water and groundwater to other parts of the Ramsar, and there are several species listed on the Ramsar citation which may occur within the PCS or nearby. There are clear impact pathways between construction, maintenance and decommissioning activity and these features.

3.4.6 The habitat with or near the PCS or access route is potentially suitable for:

- All qualifying species of plants and invertebrates
- Pied Avocet
- Lesser black-backed gull (after being enclosed and managed)
- Little Tern

- Eurasian Marsh Harrier
- Common Redshank
- Black-tailed godwit
- Common Shelduck
- Northern Shoveler
- Northern Pintail
- Common Greenshank
- Spotted Redshank
- Eurasian Teal.

3.4.7 There is a risk that these species are affected by the Project.

ALDE-ORE ESTUARY SPA (UK9009112)

3.4.8 There are published conservation objectives for the Alde-Ore Estuary SPA including a set of attributes and targets which define the conservation objectives and the condition of each feature.

3.4.9 As set out for the Ramsar site, there are only risk arising from the Project for Sandwich Tern is the spread of invasive non-native species and pathogens, and LSE cannot be excluded for Pied Avocet, Lesser Black-backed Gull, Little Tern, Eurasian Marsh Harrier and Common Redshank.

3.4.10 Ruff, which occurs with the SPA in low numbers c. 2 birds per year (BTO Webs), is more likely to be found in freshwater water habitats and marshes than in estuaries, and within the SPA at Havergate Island and the freshwater marshes within and adjoining the SPA. It is very unlikely to occur within or near the PCS or in proximity to the access route however this cannot be entirely discounted.

ORFORDNESS - SHINGLE STREET SAC (UK0014780)

3.4.11 Two of the qualifying interest habitats 1150 Coastal lagoons* (Priority feature) and 1220 Perennial vegetation of stony banks occur within the PCS and nearby and are therefore at risk of direct and indirect effects arising from the Project. The third, 1210 Annual vegetation of drift lines does not occur within or near the PCS or the access route, however there is a low risk that this habitat would be affected by invasive non-native plant species brought onto the site on construction or maintenance machinery, or spread those that are already found on- or near the PCS including Narrow-leaved Ragwort *Senecio inaequidens* and Bilbao Fleabane *Conyza floribunda*.

ALDE-ORE & BUTLEY ESTUARIES SAC (UK0030076)

3.4.12 The PCS will be accessed for construction and maintenance by crossing the River Ore, using the existing ferry route. This ferry operates frequently in the summer without detriment to the European and Ramsar sites.

3.4.13 The first impact pathway identified is the introduction of non-native species into the SAC. Since there will be no construction activity within this SAC or contact with construction machinery, any invasive non-native species brought onto site must first colonise Orford Ness to Shingle Street SAC and spread from there. The risk is therefore very low but cannot be fully discounted without mitigation.

3.4.14 The second impact pathway is the release of suspended solids (and other pollution) into ditches. However, a review of OS mapping reveals that there are no clear links between the ditches on site and the estuary. Moreover, the PCS is shingle and therefore has low content of particles which could be suspended in water. Therefore, this pathway can be discounted.

STEP FOUR, PART 2: FOR THE PROJECT 'IN COMBINATION'

3.4.15 As set out above, it is clear that the unmitigated Project poses a risk to more than one European or Ramsar site when considered alone. The predator fence already constructed for the Norfolk Projects is the other project which is most likely to act in combination with the Project, with elevated risks for the same designated sites.

3.4.16 Since there is no impact pathway between the Project any other European and Ramsar sites, there is no risk of in-combination effects on any other such site.

3.5 CONCLUSION

3.5.1 Since no impact pathways exist (or they are extremely weak), Likely Significant Effects (LSE) for the Project Alone and in combination with other Projects and Plans **can** be excluded for the following sites (and all other European and Ramsar Sites not listed below):

- Outer Thames Estuary SPA (UK9020309)
- Southern North Sea SAC (UK0030395)
- Sandlings SPA (UK9020286)
- Staverton Park & The Thicks Wantisden SAC (UK0012741)
- Minsmere to Walberswick Heaths & Marshes SAC (UK0012809)

3.5.2 Without further assessment or mitigation, and as a result of the risks identified above, Likely Significant Effects for the Project Alone and in combination with other Projects and Plans **cannot** be excluded for the following sites:

- Alde-Ore Estuary Ramsar (UK11002)
- Alde-Ore Estuary SPA (UK9009112)
- Orfordness - Shingle Street SAC (UK0014780)
- Alde-Ore & Butley Estuaries SAC (UK0030076)

3.5.3 For the Alde-Ore Estuary Ramsar, LSE can be excluded for two of the qualifying features (Eurasian Wigeon and White-fronted Goose).

3.5.4 Should on further analysis, adverse effects which cannot be mitigated be identified for Great Bittern, Gadwall, Eurasian Teal, Northern Shoveler, Hen Harrier, Eurasian Marsh Harrier, Pied Avocet, Bearded Tit or Little Tern then the effect on Minsmere - Walberswick Ramsar and SPA should also be considered i.e. it is not possible to exclude LSE for Minsmere -Walberswick Ramsar and SPA at this stage.

4 STAGE TWO: APPROPRIATE ASSESSMENT

4.1 STEP ONE: INFORMATION ON THE PROJECT & EUROPEAN/RAMSAR SITES

STEP ONE, PART 1: INFORMATION ON THE PROJECT & PROJECT SITE

4.1.1 An area of approximately 5.96 hectares will be enclosed with a fence of up to approximately 1350m in length. The fence is designed to deter foxes and other mammalian predators and therefore create a predator free area within which the birds can breed.

DESIGN

4.1.2 The installed fence is planned to be 1.8m above ground level and comprised of mesh fencing supported by steel posts. It will be part buried in the ground, extending vertically downwards by 50mm-100mm and then horizontally to form a skirt. The top of the fence will be angled at 45^0 away from the enclosure interior. The mesh will be support on steel posts and inserted into the ground. The design of the fence will be in accordance with RSPB guidance on mammal exclusion fencing (White & Hirons, 2019) and is subject to approval by the Secretary of State as part of the LBBG Implementation and Monitoring Plan. Access gates will be installed in the fence to allow for management of the vegetation within the exclusion area.

DITCH CROSSING

4.1.3 To enable access to the PCS, a ditch crossing will be required at the southern end and close to an existing concrete track. This would either be a temporary bridge or a culvert (which is permanent).

INSTALLATION

4.1.4 The fencing materials and plant will be transported to the location of the proposed fencing using standard low-loaders along existing trackways as far as possible. These materials are planned to be delivered by vessel from Orford quay to the boat landing across the Ore Estuary.

4.1.5 The proposed installation will require an excavator which will scrape back the top 50-100mm of vegetation and shingle along the alignment of the fencing to create a shallow trench up to 1,000mm wide. A dump truck may also be required to assist with earth moving.

4.1.6 Along the side of the trench closest to the enclosure, the steel fence posts will be inserted into the ground at approximately 3m intervals using a specialised tool attached to the bucket of the excavator. The tool is placed on top of each post and the bucket would be slowly lowered pushing the post into the ground to the required depth. Using this method means that the posts will not be hammered into the ground and there would be no post hole excavations or use of concrete.

4.1.7 The mesh fencing would then be rolled out and clipped to each fence post with the lower portion laid into the trench and pegged into place to create the skirt. The scrapped back shingle and pieces of vegetation will then be pushed back into place, covering the skirt.

4.1.8 The installation of the fencing would take place outside the bird nesting period (not within April to August, inclusive). The works to install the fence are expected to take two to three weeks with approximately six personnel on site undertaking the fence installation. An area of hard standing is present adjacent to the proposed fence alignment which may be used for a temporary laydown and placing temporary welfare for the duration of the fence installation works, alternatively a temporary laydown area may be formed elsewhere within the PCS. The temporary laydown and welfare will be removed after completion of the construction phase.

MONITORING, MANAGEMENT AND MAINTENANCE

4.1.9 The fence will be maintained for the lifetime of wind farm (assumed to be 40 years). Inspections, routine maintenance, and repair of the fence will be conducted as required and as set out the in the LBBG Implementation and Monitoring Plan (LIMP) (Volume 5, Report 5, Annex 5.6).

4.1.10 Habitat management will be undertaken as required within the enclosure. This will comprise cutting vegetation with a strimmer and removing the arisings to create a mosaic of short and long sward heights, to create optimum nesting habitat for LBBG. It is likely to take up to 10 days per year, depending on the quantity of vegetation to be removed. Further details are provided in the LIMP.

DECOMMISSIONING

4.1.11 At the end of the operational lifetime of the wind farm, the fencing will either be removed (with approval from the Secretary of State) or maintained either by the Applicant or a third party.

THE PROJECT SITE

HABITATS (ANNEX I)

1150 COASTAL LAGOONS* (PRIORITY FEATURE)

4.1.12 There is one larger and at least one small Annex I habitat 1150 Coastal Lagoon present within the PCS, plus others in the Initial and Eastern Survey Area, which vary in size. The definition of the Annex I habitat type encompasses all types of shallow, salt-water lagoons, with or without vegetation (EC, 2013). Those within the Initial and Eastern Survey Area are apparently percolation lagoons, comprised of sea water which has seeped under the shingle spit. The benthic substrate is shingle, which is gently sloping, and the water is estimated to be less than 0.5m deep at the deepest. The marginal vegetation comprises purple glasswort *Salicornia ramosissima* and annual sea blite *Suaeda maritima*, which gives way to open water where it is deeper. Sea rush *Juncus maritimus* is present in patches around the margins. See Figure 4.1.

4.1.13 The areas around the saline lagoons comprise mainly the NVC community SM8 - Annual Salicornia salt-marsh community plus small areas of SM9 – Suaeda maritima salt-marsh community on drier ground.

Figure 4.1: 1150 Coastal Lagoon

1220 PERENNIAL VEGETATION OF STONY BANKS

4.1.14 The predominant habitat within the PCS, and Initial and Eastern Survey Areas, is the Annex I habitat 1220 ‘Perennial vegetation of stony banks’. The definition of this Annex I habitat type encompasses all types of perennial vegetation; the unifying factor is that the vegetation occurs on coastal shingle (EC, 2013).

4.1.15 The vegetation within the PCS, and Initial and Eastern Survey Areas, is all on coastal shingle. It is primarily perennial grasses, although the structure and composition of the vegetation varies. Three main types were recognisable following the classification of Sneddon and Randall (1993) and are described below. In addition, there were occasional patches of short vegetation, apparently the result of grazing and smaller areas of the Sneddon and Randall SH76 - Festuca rubra present with various maritime herbs and the NVC communities SM16 - Sub-community, Juncus gerardii dominant and SM9 Suaeda maritima saltmarsh community.

4.1.16 Importantly, the shingle within the PCS, and the Initial and Eastern Survey Areas, is mostly level, with shallow hollows supporting the saline lagoons (described above) and artificial banks along the ditches (described below); it does not contain an obvious sequence of wave-formed ridges. These ridges, when vegetated, are the most important and delicate variation of the Annex I type. The ridges have apparently been lost from this part of Orford Ness due to past human activity (Warrington, Lohoar, & Mason, 2013)

SH71 *ARRHENATHERUM ELATIUS* GRASSLAND COMMUNITY.

4.1.17 The SH71 False oat-grass *Arrhenatherum elatius* grassland community is found in the Eastern Survey Area and in proximity to the lower slopes of the main shingle embankment. The plant species recorded here included False oat-grass *Arrhenatherum elatius,* Red Fescue *Festuca rubra*, Common Mouse-ear *Cerastium fontanum,* Ragwort *Jacobea vulgaris,* Weld *Reseda luteola,* Sheep's Sorrel *Rumex acetosella,* a clover *Trifolium* sp., and Yellow Horned Poppy *Glaucium flavum*. Crustose, Fruticose and Cladoniform lichens were also present. This community was prevalent along the eastern alignment of the proposed fence, and the eastern part of the PCS. There is a defunct fence running north-south through this area with just the upright fence posts remaining, see Figure 4.2.

Figure 4.2: SH71 *Arrhenatherum elatius* grassland community

SH78 *ELYMUS ATHERICUS* GRASSLAND COMMUNITY.

4.1.18 The SH78 sea couch *Elymus athericus* (syn *E pungens* and *E. pycnanthus*) grassland community is the dominant community within the Initial Survey Area, but less so in the Eastern Survey Area. Sea couch *Elymus athericus* is the dominant species, with Common Bent *Agrostis capillaris*, Yorkshire-fog *Holcus lanatus*, Cock's-foot *Dactylis glomerata,* Red Fescue, Common Mouse-ear, Ragwort, Sheep's Sorrel, Spear Thistle *Cirsium vulgare*, a geranium *Geranium* sp., a bitter-cress *Cardamine* sp., Teasel *Dipsacus fullonum* and bramble *Rubus fruticosus.* Sea couch is a coarse and tall grass, and the sward is generally thick with occasional thinner patches where the other species are more prevalent. There are old railway sleepers amongst the vegetation which support lichens and mosses. This community was prevalent within the Initial Survey Area outside the saline lagoons and especially within the PCS. See Figure 4.3.

Figure 4.3: SH78 *Elymus athericus* grassland community.

SH36 ELYTRIGIA ATHERICA PRESENT WITH VARIOUS MARITIME HERBS

4.1.19 Alongside and amongst the SH78 community, there are also more open areas which have a much-reduced abundance of Sea Couch, or it is absent. These support low growing herbs, lichens and mosses amongst bare shingle. Plant species present include Common Mouse-ear, a geranium, Common Cats-ear *Hypochaeris radicata*, Sheep's Sorrel, Ragwort and a vetch *Vicia* sp.. In some areas Sea-purslane *Atriplex portulacoides* is abundant and a species of stonecrop (*Sedum* sp.) is occasional. Crustose, Fruticose, Foliose and Cladoniform lichens and Common Puffball fungus *Lycoperdon perlatum* are also present. This community is present along ditch banks in the south-western edges of the Initial Survey Area, within the PCS, and in patches elsewhere. See Figure 4.4.

Figure 4.4: Open shingle community on ditch banks.

4.1.20 Areas of bare shingle with patchy vegetation are also prevalent in the eastern part of the Initial Survey Area (i.e. the Eastern Survey Area) outside the PCS. Species here include Sea Couch, False-oat grass, Common bent, Yellow Horned Poppy, Sea Beet *Beta vulgaris* subsp. *maritma.* Crustose and Fruticose lichens and mosses are also present, growing on the shingle.

DITCHES

4.1.21 The Initial Survey Area is divided into two parts by a ditch running from the northeast to the southwest (with the PCS to the west and the remainder of the Initial Survey Area to the east i.e. the Eastern Survey Area). Further ditches lie outside the PCS to the south, west and north. All ditches were similar; apparently brackish, c1m to 2.5m wide and up to c1m deep. There was no visible vegetation within the ditches other than algae. See Figure 4.5.

Figure 4.5: R1 Ditch

SPECIES

BIRDS

4.1.22 During the January survey, relatively few bird species were seen using the Initial Survey Area; Grey Heron, Little Egret, Common Redshank and Eurasian Marsh Harrier.

4.1.23 During the late summer surveys, the following bird species were recorded whilst undertaking other survey work. These were all on or over the Eastern Survey Area or nearby.

Table 4-1: Birds on-site or overhead

Common Name	Scientific Name	Count
Barn Swallow	Hirundo rustica	6
Black-headed Gull	Chroicocephalus ridibundus	2 over
Common Buzzard	Buteo buteo	3 over
Comon Kestrel	Falco tinnunculus	1 over
Common Redshank	Tringa totanus	2
Common Shelduck	Tadorna tadorna	6 over
Eurasian Curlew	Numenius arquata	1
Eurasian Marsh Harrier	Circus aeruginosus	1 over
Eurasian Teal	Anas crecca	30
Greater Black-backed gull	Larus marinus	5 over

Common Name	Scientific Name	Count
Grey Heron	Ardea cinerea	1
Herring Gull	Larus argentatus	2 over
Linnet	Linaria cannabina	6
Little Egret	Egretta garzetta	1
Mallard	Anas platyrhynchos	10 over
Meadow Pipit	Anthus pratensis	20
Snipe	Gallinago gallinago	1 over

Species in bold are qualifying interest species of one of the Ramsar or SPAs

4.1.24 A review of the potential of the PCS to support the qualifying interest bird species is provided in Table 4-2.

Table 4-2: Qualifying Interest Bird Species

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
Birds - Breeding					
Bearded tit	*Panurus biarmicus*	*..found in extensive reedbeds (Phragmites) and is associated with dense non-woody vegetation in and beside fresh and brackish water, or immediately adjoining marshes and swamps.*	The habitat within the Initial Survey Area does not include reed bed and is therefore not suitable for this species for breeding. May occasionally pass through when not breeding. There are records of this species at Orford Ness. None were recorded during the surveys.	✓	
Eurasian Marsh Harrier	*Circus aeruginosus*	*Nests are normally found in freshwater or brackish reed beds, in other wetlands with tall emergent vegetation and few or no trees, or in tall crops adjacent to a wetland* (Hardey, et al., 2013) *….inhabits extensive areas of dense marsh vegetation, in fresh or brackish water, generally in lowlands*	The habitat within the Initial Survey Area does not include reed bed and is therefore not optimal nesting habitat for this species, it is suitable hunting habitat for this species. **One or two Eurasian Marsh Harrier were present during the surveys in January and late summer. .**	✓	✓
Eurasian Teal	*Anas crecca*	*..small outlying ponds, lagoons, oxbows, slow flossing streams and other diminutive water bodies .. bordered by dense herb layer*	The saline lagoons within the Initial Survey Area may offer suitable breeding habitat for this species. There are records of this species at Orford Ness and	✓	✓

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
			it was observed during the surveys but not breeding. **A flock of 30 was observed in the late summer surveys.**		
Gadwall	*Anas strepera*	*…inhabits highly productive and eutrophic freshwater marsh or lake habitats in open lowland grassland, showing a preference for sheltered, shallow, standing or slow-flowing waters with abundant emergent vegetation and grass-covered islands providing cover for nesting*	The habitat within the Initial Survey Area does not include waterbodies of this type and is therefore not suitable for this species for breeding or over-wintering. May occasionally pass through when not breeding. There are records of this species at Orford Ness. None were recorded during the surveys.	✓	✓
Great Bittern	*Botaurus stellaris*	*The species has highly restrictive breeding habitat requirements. It shows a strong preference for quiet lowland marshes around lakes and rivers (less than 200 m above sea-level) with extensive dense young reedbeds of Phragmites spp. (e.g. with 1- 3 years worth of new growth but still maintaining some old or dead stems) that are flooded but are fairly shallow (less than 30 cm deep) have few fluctuations in*	The habitat within the Initial Survey Area does not include reed bed and is therefore not suitable for this species for breeding. May occasionally pass through when not breeding. There are records of this species at Orford Ness. None were recorded during the surveys.	✓	✓

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
		water-level, have low acidity and are surrounded by clear open areas of deeper water is maintained into the driest part of the breeding season…			
Lesser Black-backed Gull	*Larus fuscus*	*The species breeds in colonies, showing a preference for level-ground that is well covered with fairly close, short vegetation, often nesting under heather, bracken or other vegetation (sometimes under pine trees). Suitable sites include flat, unbroken grassy slopes, sand-dunes, the tops and ledges of coastal cliffs, rocky offshore islands, saltmarshes, the margins of inland lakes, islands in lakes and rivers, and high moorland, although the species will also nest on buildings and rooftops.*	Most of the Orford Ness gulls currently breed in Lantern Marshes, an area of saltmarsh towards the north of the spit, dominated by the tall grass *Elytrigia atherica*. The colony is on small islands within a network of ditches and creeks, which are each approximately 2-3 m wide…. Although gulls benefit from the shelter provided by some vegetation, gulls avoid nesting in very dense vegetation. Larger numbers nest at Havergate Island. The Initial Survey Area is shingle rather than salt marsh but large areas are dominated by dense *Elytrigia atherica* It is divided by ditches but there is access on land to all areas. LBBG does not breed here currently. None were recorded during the surveys.	✓	✓

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
Little Tern	*Sternula albifrons*	*...breeds on barren or sparsely vegetated beaches, islands and spits of sand, shingle, shell fragments, pebbles, rocks or coral fragments on seashores or in estuaries….fishes in very shallow water only a few centimetres deep, often over the advancing tideline or in brackish lagoons and saltmarsh creeks*	The Initial Survey Area does not include suitable nesting habitat, but it does include brackish lagoons and ditches within which Little Tern may fish, the latter apparently supports fish as evidenced by a hunting common seal. None were recorded during the surveys.	✓	✓
Mediterranean Gull	*Larus melanocephalus*	*… breeds on the .. coast at lagoons, estuaries and sometimes coastal saltmarsh, often also breeding inland on large steppe lakes and marshes in open lowland areas. It nests near water on flood-lands, fields and grasslands and on wet or dry areas of islands, favouring sparse vegetation but generally avoiding barren sand… breeds in dense colonies*	In Britain, the Mediterranean Gull typically nests within Black-headed-Gull colonies, which is much the commoner species. It breeds a Minsmere but only rarely in other places in Suffolk. There are no recent records of breeding at Orford Ness however there are records of Black-headed Gull breeding at Lantern, Kings and Havergate Marshes. Mediterranean Gull is unlikely to breed away from these areas. None were recorded during the surveys.	✓	

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
Northern Shoveler	*Anas clypeata*	*..inhabits permanent shallow freshwater wetlands from sea level up to 2,900 m (Ethiopia), preferred sites being those surrounded by dense stands of reeds or other emergent vegetation whilst being free of overhanging trees or fringing forest. Copious submerged aquatic vegetation sheltering abundant planktonic invertebrates is a valuable habitat characteristic. Suitable habitats include well-vegetated lakes and marshes and with muddy shores and substrates in open country (e.g. grasslands),*	The habitat within the Initial Survey Area does not include waterbodies of this type and is therefore not suitable for this species for breeding or over-wintering. May occasionally pass through when not breeding. There are records of this species at Orford Ness.	✓	✓
Pied Avocet	*Recurvirostra avosetta*	*…breeds in flat open areas with islands, ridges, spits or margins of bare sand, clay or mud and sparse short vegetation including coastal lagoons….. inhabits coastal and inland saline lakes and mudflats lagoons, pools, saltpans…*	The Initial Survey Area includes saline lagoons which are potentially suitable nesting and foraging habitat for this species although there was no evidence of either and this species is not known to breed here. None were recorded during the surveys however **this species was observed in the estuary.**	✓	✓

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
Sandwich Tern	*Thalasseus sandvicensis*	*…forms colonies on sandy islands, rocky calcareous islets, sand-spits, sand-dunes, shingle beaches and extensive deltas* (BirdLife International, 2024)	The Initial Survey Area does not include suitable nesting or foraging habitat for Sandwich Tern. None were recorded during the surveys.	✓	✓
Bird - Non-breeding					
Black-tailed Godwit	*Limosa limosa islandica*	*…sheltered estuaries and lagoons with large intertidal mudflats, sandy beaches, salt-marshes and salt-flats*	More likely to be found foraging in the soft sediments of the estuary than among the saline lagoons with shingle substrate found in the Initial Survey Area. The tall perennial grass vegetation on the shingle is not suitable habitat for this species. None were recorded during the surveys however there are records of this species at Orford Ness.	✓	
Common Greenshank	*Tringa nebularia*	*…frequents a variety of freshwater, marine and artificial wetlands, including saltmarshes, sandy or muddy coastal flats, estuaries …. lagoons*	The Initial Survey Area mainly comprises dense perennial grasses which is likely to deter this species, while the saline lagoons may provide suitable foraging habitat for this species. None were recorded during the surveys however there are	✓	

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
			records of this species at Orford Ness.		
Common Redshank	*Tringa totanus*	*…largely coastal occupying rocky, muddy and sandy beaches, saltmarshes, tidal mudflats, saline and freshwater coastal lagoons, tidal estuaries*	The lagoons within the Initial and Eastern Survey Area are suitable foraging habitat for this species while the perennial grass vegetation on shingle is unsuitable. **One or two were observed during the surveys making use of ditches and saline lagoons for foraging.**	✓	✓
Common Shelduck	*Taodorna tadorna*	*…preference for saline habitats and frequents mudflats and muddy or sandy estuaries in coastal regions…*	More likely to be found in the estuary than among the shingle found in the Initial Survey Area. The tall perennial grass vegetation on the shingle is not suitable habitat for this species. None were recorded during the surveys within the Survey Areas however **six flew overhead.**	✓	
Eurasian Marsh Harrier	*Circus aeruginosus*	*..inhabits extensive areas of dense marsh vegetation, in fresh or brackish water,*	The habitat within the Initial Survey Area and PC is suitable hunting habitat for this species, **this species was observed during the surveys.**		✓

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
Eurasian Teal	*Anas crecca*	*…flooded gravel pits, reservoirs and floodplain meadows*	The Initial and Eastern Survey Areas mainly comprises dense perennial grasses which is likely to deter this species, while the vegetation of the saline lagoons was annual and provides little forage for this species in winter. **Thirty were recorded during the surveys in October, on one of the larger saline lagoons in the Eastern Survey Area.**	✓	✓
Gadwall	*Anas strepera*	*Rarely (e.g. in the winter) the species occurs along sheltered coasts at coastal marshes (North America), estuaries, deltas or lagoons*	This species is very unlikely to make use of the saline lagoons during the winter. None were recorded during the surveys however this species has been recorded at Orford Ness.	✓	✓
Greater White-fronted Goose	*Anser albifrons albifrons*	*…in open country on improved grassland, stubble fields … wet meadows… in brackish and freshwater marshy habitats*	The Initial and Eastern Survey Areas mainly comprises dense perennial grasses which is likely to deter this species, while the vegetation of the saline lagoons was annual and provides little forage for this species in winter. None were recorded during the surveys. There are two records	✓	✓

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
			of this species at Orford Ness in 2007.		
Hen Harrier	*Circus cyaneus*	*...coastal sand dunes and marshy areas.*	The Initial Survey Area and PCS is suitable hunting habitat for this species during winter and there are records of this species at Orford Ness.		✓
Northern Pintail	*Anas acuta*	*Wetland habitats include shallow freshwater marshes, small marshy lakes, slow-flowing rivers, wet meadows, flood-plains and sewage ponds (southern Africa), especially favouring ponds with low, dense marginal vegetation and wetlands interspersed with brushy thickets or copses. During the winter, it also frequents large inland lakes, brackish coastal lagoons, brackish and saline marshes, shallow fresh or brackish estuaries, tidal flats and river deltas with adjacent agricultural land (e.g. stubble fields) and scattered impoundments*	The Initial Survey Area contains brackish coastal lagoons and may therefore be suitable for this species. There are records of this species at Orford Ness, however none were recorded during the surveys.	✓	
Northern Shoveler	*Anas clypeata*	*…permanent shallow freshwater wetland …. coastal brackish*	The saline lagoons within the Initial Survey Area are probably	✓	✓

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
		lagoons, tidal mudflats, estuaries, coastal shorelines, fresh and brackish estuarine marshes, inland seas and brackish or saline inland waters	too shallow to provide suitable foraging habitat for this species. The tall perennial grass vegetation on the shingle is not suitable habitat for this species. There are records of this species at Orford Ness. None were recorded during the surveys however there are records of this species at Orford Ness.		
Pied Avocet	*Recurvirostra avosetta*	*…inhabits coastal and inland saline lakes and mudflats lagoons, pools, saltpans…*	The saline lagoons within the Initial Survey Area may provide suitable foraging habitat for this species although none were present during the survey. **This species was observed in the Ore Estuary**. None recorded during the surveys at the PCS however this species was observed in the estuary.	✓	✓
Ruff	*Calidris pugnax*	*…muddy margins of brackish, saline and alkaline lakes, ponds, pools, rivers, marshes and food-plains, as well as freshly mown or grazed short-sward and wheat…fields, usually roosting at night in the shallow waters of lake shores*	The Initial Survey Area mainly comprises dense perennial grasses which is likely to deter this species, while the saline lagoons may provide suitable foraging habitat for this species. None were recorded during the surveys however there are		✓

Common Name	Scientific Name	Habitat, *taken from* (BirdLife International, 2024)	Review and Survey Results	Ramsar Feature	SPA Feature
			records of this species at Orford Ness.		
Spotted Redshank	*Tringa erythropus*	*…a variety of freshwater and brackish wetlands …brackish lagoons, saltmarshes, saltpans, sheltered muddy coastal shores and mudflats…*	The saline lagoons within the Initial and Eastern Survey Area may provide suitable foraging habitat for this species although none were present during the survey. The tall perennial grass vegetation on the shingle is not suitable habitat for this species. None were recorded during the surveys. However, there are records of this species at Orford Ness.	✓	
Eurasian Wigeon	*Anas penelope*	*…coastal salt-marshes, freshwater, brackish and saline lagoons, flooded grasslands, estuaries, intertidal mudflats, and other sheltered marine habitats*	The Initial and Eastern Survey Areas mainly comprises dense perennial grasses which is likely to deter this species, while the vegetation of the saline lagoons was annual and provides little forage for this species in winter. None were recorded during the surveys however this species has been recorded at Orford Ness.	✓	

PLANTS

4.1.25 As the survey was undertaken in January and August, the latter outside the PCS, a review of their ecology of the Ramsar plant species and potential for these to be present is provided in Table 4-3. However, none were recorded during the site surveys and these species are therefore likely to be absent from the two survey areas currently.

Table 4-3 Ramsar Plant Species

Scientific Name	Common Name	**Habitat (taken from Plant Atlas 2020** (Stroh, Walker, Humphrey, Pescott, & Burkmar, 2023)**)**	Review and Survey Results
Althaea officinalis	Marsh mallow	*A perennial herb of coastal habitats, growing on the banks of ditches containing brackish water, in brackish pastures, and in the transition zone between the upper saltmarsh and freshwater habitats.*	Suitable habitat may be present along the brackish ditches within the Initial and Eastern Survey Areas. This species may have been detectable in January but was not recorded. Not recorded during the surveys.
Frankania laevis	Sea heath	*A mat-forming perennial herb of saltmarshes and saltmarsh-sand dune transitions, especially amongst Suaeda vera Shrubby Sea-blite where firm sand or silt overlies coarser-grained material; also rarely on shingle beaches and sea-cliffs.*	The habitat in the Initial and Eastern Survey Areas is not the typical habitat of this species and it is therefore likely to be absent. Not recorded during the surveys.
Lathyrus japonicus	Sea pea	*A long-lived perennial herb, forming large and conspicuous patches on shingle beaches, or rarely, in smaller quantities on blown sand.*	The grassland with the Initial and Eastern Survey Areas is probably too dense for this species and none was found in the more open shingle areas during the survey. Not recorded during the surveys.
Lepidum latifolium	Dittander	*A rhizomatous, patch-forming perennial herb, restricted as a native to coastal creek-sides, coastal ditches, sea-walls, open brackish grassland and the upper fringes of estuarine saltmarshes.*	The ditches within the Initial and Eastern Survey Areas have the potential to support this species. Not recorded during the surveys.

Scientific Name	Common Name	**Habitat (taken from Plant Atlas 2020** (Stroh, Walker, Humphrey, Pescott, & Burkmar, 2023)**)**	Review and Survey Results
Medicago minima	Bur Meddick	*A winter-annual herb of dry, open, well-drained, sandy or gravelly places, in short open turf and in disturbed ground; also occasionally found as a casual*	The short-grazed vegetation which is infrequent within the Initial and Eastern Survey Areas has the potential to support this species. Not recorded during the surveys.
Parapholis incurva	Curved Hard-grass	*An annual of bare places by the sea, including gravelly mud banks, shingle ridges, rock ledges and cliff-tops, and the uppermost parts of saltmarshes; also in artificial habitats such as sea-walls and wooden mooring stays.*	The open shingle community within the Initial and Eastern Survey Areas has the potential to support this species. Not recorded during the surveys.
Puccinellia fasciuculata	Borrer's saltmarsh grass	*A tufted short-lived perennial grass of bare places by the sea, in grazing marshes around cattle-poached pools and depressions, on earthen sea-walls, vehicle tracks and the mud dredged from ditches.*	The habitat in the Initial and Eastern Survey Areas is not the typical habitat of this species and it is therefore likely to be absent. Not recorded during the surveys.
Ruppia cirrhosa	Spiral tasselweed	*A perennial aquatic which occurs in similar habitats to R. maritima, including coastal lakes, tidal inlets, creeks and brackish ditches. It usually grows in deeper water than that species and tolerates more saline conditions, even growing with Zostera species*	The ditches within the Initial and Eastern Survey Areas have the potential to support this species. Not recorded during the surveys.
Sarcocornia perennis	Perennial glasswort	*A woody perennial subshrub of saltmarshes, especially in bare or sparsely vegetated areas on firm, muddy sand and gravel. S. perennis occurs on eroding lower parts of saltmarshes, at higher*	The shingle within the Initial and Eastern Survey Areas has the potential to support this species.

Scientific Name	Common Name	Habitat (taken from Plant Atlas 2020 (Stroh, Walker, Humphrey, Pescott, & Burkmar, 2023))	Review and Survey Results
		elevations on saltmarsh drift-lines and on shell and shingle banks; sometimes also on bare ground behind sea-walls.	Not recorded during the surveys.
Sonchus palustris	Marsh Sowthistle	*A perennial herb of tall vegetation beside rivers on damp peaty or silty soils rich in nitrogen. It is also moderately tolerant of saline conditions, and can grow near tidal river mouths.*	The habitat in the Initial and Eastern Survey Areas is not suitable for this species. Not recorded during the surveys.
Trifolium suffocatum	Suffocated clover	*A winter-annual herb of thin, dry soils on rocky coasts or on acidic compacted sand and shingle, either in open turf or on bare ground, and often part of a species-rich mosaic of annuals or bulbous plants. It occasionally grows on moister soils, but only in situations that are baked dry in summer.*	A small clover without flowers was found within the Initial Survey Area which could have been this species. However, the vegetation within the Initial and Eastern Survey Areas is mostly too dense for this species except in small patches which apparently been grazed. Not recorded during the surveys.
Trifolium glomeratum	Clustered Clover	*A winter-annual herb of short, open communities on light, drought-prone often somewhat acidic sandy or stony soils near the coast. Habitats include pathside banks, seafront lawns and cliff-slopes….*	The habitat in the Initial and Eastern Survey Areas is not the typical habitat of this species and it is therefore likely to be absent. Not recorded during the surveys.

Scientific Name	Common Name	**Habitat (taken from Plant Atlas 2020** (Stroh, Walker, Humphrey, Pescott, & Burkmar, 2023)**)**	Review and Survey Results
Trifolium striatum	Knotted Clover	*A winter-annual herb of short, open communities around rock outcrops and on thin, relatively infertile drought-prone soils. Habitats include well-drained pastures, grassy banks and road verges.*	The habitat in the Initial and Eastern Survey Areas is not the typical habitat of this species and it is therefore likely to be absent. Not recorded during the surveys.
Trifolium scabrum	Rough Clover	*A winter-annual herb of thin, infertile, drought-prone soils over limestone, sand and gravel; by the sea also in summer-parched cliff-top grasslands. It grows in similar habitats to T. striatum, and frequently grows with it, but tends to occupy rockier, drier and more strongly leached (acidic) microsites.*	A small clover without flowers was found within the Initial Survey Area which could have been this species. However, the vegetation within the Initial and Eastern Survey Areas is mostly too dense for this species except in small patches which apparently been grazed. Not recorded during the surveys.
Vicia lutea	Yellow-vetch	*An annual herb of a variety of coastal habitats where it is presumed to be native, including scrubby grassland and cliffs, and on open yet consolidated shingle. In southern Scotland it is confined to sheltered sea-cliffs.*	The habitat with the Initial and Eastern Survey Areas is apparently suitable for this species however it is unlikely that it would be detected in January. Not recorded during the surveys.
Zostera angustifolia	Narrow-leaved Eelgrass	*Although a coastal species, this rhizomatous perennial is found at higher levels of the shore than Z. marina. It grows in the inter-tidal zone in sheltered estuaries, bays and harbours, where it is found on mixed substrates of sand and mud.*	The Initial and Eastern Survey Areas does not include intertidal habitats and it is therefore unsuitable for this species. Not recorded during the surveys.

Scientific Name	Common Name	**Habitat (taken from Plant Atlas 2020** (Stroh, Walker, Humphrey, Pescott, & Burkmar, 2023)**)**	Review and Survey Results
		Plants are often concentrated in pools or runnels on the shore.	

INVERTEBRATES

4.1.26 An assessment of the potential and the survey results for invertebrate species listed as special interest on the Ramsar citation is provided in Table 4-4.

Table 4-4: Ramsar Invertebrate Species

Scientific Name	Common Name	Habitat	Review and Survey Results
Malacosoma castrensis	Ground Lackey Moth	Feeds on a range of saltmarsh plants such as sea wormwood *Artemisia maritima* and sea-lavender *Limonium vulgare*.	The habitat with the Initial and Eastern Survey Areas **is** apparently suitable for this species. Not recorded during the surveys.
Campsicnemus magius	Fancy-legged fly	Occurs on bare mud in coastal levels and upper saltmarsh where there is an intermediate level of salinity and does not normally occur on the tidal parts of a saltmarsh.	The habitat with the Initial and Eastern Survey Areas is apparently not suitable for this species. Not recorded during the surveys.
Cheilosia velutina	A hoverfly	Recent records are from the chalk pits and adjacent areas.	The habitat with the Initial and Eastern Survey Areas is apparently not suitable for this species. Not recorded during the surveys.
Empis prodomus	A species of fly	Associated with dry sandy heathlands with trees. Typically, the Brecklands in East Anglia.	The habitat with the Initial and Eastern Survey Areas is apparently not suitable for this species. Not recorded during the surveys.
Dixella attica	A species of fly	Unknown.	Unknown. Not recorded during the surveys.
Hylaeus euryscapu syn Hylaeus annularis	Shingle Yellow-face Bee	Restricted to coastal shingle in south and south-eastern England where it nests in hollow plant stems and forages on Sea Kale, Sea Spurge,	Habitat with the Initial and Eastern Survey Areas **may be** suitable for this species. Not recorded during the surveys.

Scientific Name	Common Name	Habitat	Review and Survey Results
		umbellifers, ragworts, hawkbits, and bramble.	
Pseudamnicola confusa	A snail	Freshwater	The habitat with the Initial and Eastern Survey Areas is apparently not suitable for this species. Not recorded during the surveys.
Nematolstella vectensis	Starlet sea anemone	Lives in isolated or semi-isolated brackish pools in saltmarsh and lagoons, in ditches and on mudflats in saltmarshes and shallow estuaries at or above high water, typically in mud, muddy sand and muddy shingle but is also found on vegetation	The saline lagoons within the Initial and Eastern Survey Areas **may be** suitable for this species. Not recorded during the surveys.
Gammarus insnensibili	Lagoon sand shrimp	limited to sheltered, shallow, brackish water habitats with a variety of sediments ranging from organic muds to shingle with various admixtures of sand and silt-clay. Gammarus insensibilis appears to be associated with the alga Chaetomorpha linum, which may form extensive floating mats	The saline lagoons within the Initial and Eastern Survey Areas **may be** suitable for this species. Not recorded during the surveys.
Euophrys browning syn. *Pseudeuophrys obsoleta.*	a jumping spider	Described by JNCC as Nationally Scarce and is a Section 41 species. Confined to a few shingle beaches in	**Recorded during the surveys on the surface of one of the large old timber planks on an area of open**

Scientific Name	Common Name	Habitat	Review and Survey Results
		eastern and south-eastern England where it can be found in tide litter and inside empty whelk shells.	**shingle in the centre of the Eastern Survey Area on 28.08.24.**
Baryphyma duffeyi syn. *Praestigia duffeyi.*	Duffy's Bell-headed Spider	Described by JNCC as Endangered and is a Section 41 species. Known in the UK only from the coasts of Suffolk and Essex and Kent where it can be found in tidal litter or on mud beneath vegetation in saltmarshes and brackish marshes. The only recent records are from Orford Ness. Development and habitat degradation may have adversely affected previously known sites.	The habitat with the Initial and Eastern Survey Areas is apparently not suitable for this species. Not recorded during the surveys.
Haplodrassus minor	A spider	Among tide litter and sparse vegetation and shingle on the seashore.	The vegetation with the western Initial and Eastern Survey Areas is probably too dense for this species however habitat suitable **is** suitable in the eastern part. Not recorded during the surveys.
Trichoncus affinis	A spider	Among the roots of sparse vegetation on shingle.	The vegetation with the western part of the Initial Survey Area is probably too dense for this species however habitat suitable **is** suitable in the Eastern Survey Area. Not recorded during the surveys.

ECOLOGICAL CONNECTIONS

4.1.27 As set out at Stage 1, the PCS lies within, and is therefore an integral part of, the following designations:

- Alde-Ore Estuary Ramsar (UK11002)
- Alde-Ore Estuary SPA (UK9009112); and
- Orfordness - Shingle Street SAC (UK0014780)

4.1.28 In addition, the site access route crosses and is adjacent to the Alde-Ore & Butley Estuaries SAC (UK0030076).

4.1.29 Finally, it is possible that some of the birds which occur at or near the PCS also make up part of the qualifying interest of the Minsmere - Walberswick SPA (UK9009101) and Ramsar (UK11044). These designated sites are omitted from detailed descriptions because there would first have to be a residual adverse effect on the relevant bird species at the Alde-Ore Estuary SPA and Ramsar SPA.

ENVIRONMENTAL CONNECTIONS

4.1.30 Also as set out at Stage 1, The Alde-Ore & Butley Estuaries SAC (UK0030076) is adjacent and may be connected hydrologically to the PCS however there are no clear surface water connections between the PCS and this SAC, and any connection is likely to be via groundwater only.

STEP ONE, PART 2: INFORMATION ON EUROPEAN & RAMSAR SITES

ALDE-ORE ESTUARY RAMSAR (UK11002)

BRIEF DESCRIPTION

4.1.31 The Alde-Ore Estuary Ramsar comprises the estuary complex of the Rivers Alde, Butley and Ore, plus Havergate Island, all of Orford Ness shingle spit and the coast at Shingle Street as far south as Bawdsey. It was designated as a Ramsar site in 1996.

QUALIFYING FEATURES

4.1.32 Further information on the qualifying features of the Alde-Ore Estuary Ramsar for which LSE could not be excluded at Stage 1 Screening is provided in Table 4-5. This includes, where possible, their population size and distribution at the time of designation and more recently, whether the feature is apparently in favourable or unfavourable condition and whether the overarching conservation objective is ‘maintain’ or ‘restore’. The baseline reference value is the population in 1991-1995 for Little Tern and the population in the years 1998/9 to 2002/3 for the other bird species.

Table 4-5: Alde-Ore Estuary Ramsar Qualifying Interest Features Condition & Overall Objectives

Qualifying Feature	Baseline Reference Value	Current	Summary Condition/ Objective	Comments
Marsh mallow	N.D.	N.D.	Unknown	Remains present at Orford Ness.
Sea heath	N.D.	N.D.	Unknown	Distribution has reduced at Orford Ness, perhaps now only present at the southern end of the Spit.
Sea pea	N.D.	N.D.	Unknown	Remains widely distributed on Orford Ness.
Dittander	N.D.	N.D.	Unknown	Remains widely distributed on Orford Ness.
Bur meddick	N.D.	N.D.	Unknown	Remains present at Orford Ness
Curved hard-grass	N.D.	N.D.	Unknown	Remains widely distributed on Orford Ness.
Borrer's saltmarsh grass	N.D.	N.D.	Unknown	Remains widely distributed on Orford Ness.
Spiral tasselweed	N.D.	N.D.	Unknown	Remains widely distributed on Orford Ness.
Perennial glasswort	N.D.	N.D.	Unknown	Remains widely distributed on Orford Ness.
Marsh sowthistle	N.D.	N.D.	Unknown	Remains present at Orford Ness, although range appears to have contracted.
Suffocated clover	N.D.	N.D.	Unknown	Remains widely distributed on Orford Ness.

Qualifying Feature	Baseline Reference Value	Current	Summary Condition/ Objective	Comments
Yellow-vetch	N.D.	N.D.	Unknown	Remains widely distributed on Orford Ness.
Narrow-leaved Eelgrass	N.D.	N.D.	Unknown	Remains present at Orford Ness, although range appears to have contracted.
Ground Lackey	N.D.	N.D.	Unknown	Present at Orford Ness in 2019
Fancy-legged fly	N.D.	N.D.	Unknown	No recent records at Orford Ness
Cheilosia velutina a hoverfly	N.D.	N.D.	Unknown	No recent records at Orford Ness
Empis prodomus a fly	N.D.	N.D.	Unknown	Recorded at Orford Ness in the last 10 years
Dixella attica a fly	N.D.	N.D.	Unknown	No recent records at Orford Ness
Shingle Yellow-face Bee	N.D.	N.D.	Unknown	No recent records at Orford Ness
Pseudamnicola confusa a snail	N.D.	N.D.	Unknown	No recent records at Orford Ness
Starlet sea anemone	N.D.	N.D.	Unknown	Recorded at Orford Ness in the last 10 years
Lagoon sand shrimp	N.D.	N.D.	Unknown	No recent records at Orford Ness
Euophrys browningi syn. *Pseudeuophrys obsoleta* a jumping spider	N.D.	N.D.	Unknown	Recorded during surveys in 2024.
Duffy's Bell-headed Spider	N.D.	N.D.	Unknown	Recorded at Orford Ness in the last 10 years
Haplodrassus minor, a spider	N.D.	N.D.	Unknown	No recent records

Qualifying Feature	Baseline Reference Value	Current	Summary Condition/ Objective	Comments
Trichoncus affinis, a spider	N.D.	N.D.	Unknown	No recent records
Eurasian Marsh Harrier (Breeding)	3 pairs	3 pairs in 2019, 2 in 2020, 3 in 2021	Favourable/ Maintain	This species is present year-round at Orford Ness. The saltmarsh at Havergate Island, Orford Ness and along the Butley and Alde rivers, is important for nesting
Little Tern (Breeding)	88 pairs	0 breeding pairs in 2019, 2020, 2021	Unfavourable/ Restore	In 2019, four were at Orfordness Lagoon and two at the River Ore by Havergate Island, these being the most recent records, the next most recent being from 2016 when there were three pairs at Shingle Street which did not stay to breed, and in 2013, just 4 breeding pairs attempted to breed on the site.
Lesser Black-backed Gull (breeding)	14,070 pairs	535 pairs in 2020 and 1,767 in 2019.	Unfavourable/ Restore	Most of the nests were at Havergate Island with less than 100 nesting at Orford Ness; where it was reported that only those which nest on top of buildings successfully fledged young.
Mediterranean Gull (Breeding)	6 pairs	0 breeding pairs in 2019, 2020, 2021	Unfavourable/ Restore	Recolonisation for this species would most likely be within existing Black-Headed Gull colonies at Kings, Lantern or Havergate Marshes.
Pied Avocet	104 pairs	74 pairs in 2019, 67 in	Unfavourable/ Restore	Breeding is reported from Aldeburgh,

Qualifying Feature	Baseline Reference Value	Current	Summary Condition/ Objective	Comments
		2020 and 59 pairs in 2021 (Suffolk Bird Group, 2022)		Hazelwood, Havergate, and Orford Ness, with 55 pairs on average at Orford Ness. Just outside the Ramsar site, a further 55 pairs on average bred at Boyton and Hollesley Marshes.
Sandwich Tern (Breeding)	169 pairs	0 breeding pairs in 2019, 2020, 2021	Unfavourable/ Restore	The Sandwich Tern colony at Orford Ness was on Havergate Island but it was more or less abandoned in 1997, with nesting occurring only in some years with a maximum of 15 pairs in 2003.
Black-tailed Godwit (Non- Breeding)	283 individuals	1123 individuals, 5-year peak mean 17/18-21/22 (WeBS) for the Alde Estuary	Favourable/ Maintain	No recent distribution information; likely to forage widely on exposed mudflats in the Estuary. .
Common Greenshank (Non-Breeding)	29 individuals	5 individuals	Unfavourable/ Restore	Reported from Orford Ness, the Alde Estuary, including at Iken, and Havergate Island.
Common Redshank (Non-Breeding)	2368 individuals	2,134 individuals	Unfavourable/ Restore	Reported from Havergate Island in winter and is likely to occur widely in the Ramsar site. Important feeding habitats within the site include the intertidal mudflats located in the Upper Alde Estuary and along the estuary from Snape to North Weir Point.

Qualifying Feature	Baseline Reference Value	Current	Summary Condition/ Objective	Comments
				In addition, 42 pairs bred at Orford Ness in 2019 which may contribute to the non-breeding population.
Common Shelduck (Non- Breeding)	1398 individuals	1124 individuals	Unfavourable/ Restore	Reported from Havergate Island and Orford Ness
Eurasian Teal (Non- Breeding)	2447 individuals	3163 individuals	Favourable/ Maintain	Reported from, Orford Ness, the Alde Estuary, including at Iken, and Havergate Island. Makes use of saline lagoons.
Northern Pintail (Non- Breeding)	556 individuals	128 individuals	Unfavourable/ Restore	Reported from Alde Estuary, Aldeburgh, Butley River, Havergate Island, Orfordness, and Shingle Street,
Northern Shoveler (Non- Breeding)	224 individuals	400 individuals	Favourable/ Maintain	Breeds at Havergate Island and Orford Ness, and reported from Orford Ness during the winter.
Pied Avocet (Non-Breeding)	1187 individuals	1,552 individuals	Favourable/ Maintain	Occurs at Havergate Island and elsewhere in the Estuary. Important feeding habitats within the site include the intertidal mudflats located in the Upper Alde Estuary and along the estuary from Snape to North Weir Point.
Spotted Redshank (Non- Breeding)	44 individuals	3 individuals	Unfavourable/ Restore	Reported from Orford Ness and Havergate Island.

Greater White-fronted Goose and Eurasian Wigeon were 'screened out' at Stage 1 and are therefore not included in the table.
N.D. = no data.

CONSERVATION OBJECTIVES

4.1.33 There are no published conservation objectives for the Ramsar site qualifying features. Therefore, these are assumed to be the same as for an SAC for the plant and invertebrate species and the same as an SPA for the bird species.

4.1.34 On that basis the assumed conservation objectives are:

- For plants and invertebrates: to ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring:
  - the extent and distribution of habitats of the qualifying species
  - the structure and function of the habitats of the qualifying species
  - the supporting processes on which the habitats of qualifying species rely
  - the populations of each of the qualifying species
  - the distribution of qualifying species within the site
- For birds: ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:
  - the extent and distribution of the habitats of the qualifying features
  - the structure and function of the habitats of the qualifying features
  - the supporting processes on which the habitats of the qualifying features rely
  - the populations of each of the qualifying features
  - the distribution of qualifying features within the site.

4.1.35 Similarly, there are no defined attributes or targets for the Ramsar features unless these are also birds which are also qualifying features of the SPA.

ALDE-ORE ESTUARY SPA (UK9009112)

BRIEF DESCRIPTION

4.1.36 The Alde-Ore Estuary SPA overlaps with the Ramsar site and has the same boundary, except the SPA excludes the southern part of Orford Ness spit. The SPA was designated in 1996, the same year that it was designated a Ramsar.

QUALIFYING FEATURES

4.1.37 Further information on the qualifying features of the Alde-Ore Estuary SPA for which LSE could not be excluded at Stage 1 Screening is provided in Table 4-6. Whilst the year of designation is the same for the SPA and Ramsar, the baseline years are different, being 1989/90 to 1993/94 for the SPA, and therefore the baseline reference value differs between the SPA and the Ramsar for the same feature, which can lead to different outcomes for the conservation condition and overall conservation objective (for example, see Common Redshank).

Table 4-6: Alde-Ore Estuary SPA Qualifying Features Condition & Overall Objectives

Qualifying Feature	Baseline Reference Value	Current	Summary Condition/ Objective	Comments
Eurasian Marsh Harrier (Breeding)	3 pairs	3 pairs in 2019, 2 in 2020, 3 in 2021	Favourable/ Maintain	This species is present year-round at Orford Ness. The saltmarsh at Havergate Island, Orford Ness and along the Butley and Alde rivers, is important for nesting
Lesser Black-backed Gull (breeding)	14,070 pairs	1,767 pairs in 2019 and 535 in 2020	Unfavourable/ Restore	Most of the nests were at Havergate Island with less than 100 nesting at Orford Ness; where it was reported that only those which nest on top of buildings successfully fledged young.
Little Tern (Breeding)	48 pairs	0 breeding pairs in 2019, 2020, 2021	Unfavourable/ Restore	In 2019, four were at Orford Ness Lagoon and two at the River Ore by Havergate Island, these being the most recent records, the next most recent being from 2016 when there were three pairs at Shingle Street which did not stay to breed, and in In 2013, just 4 breeding pairs attempted to breed on the site. The estuary was important in providing feeding habitat for Little Tern, which also foraged offshore.
Pied Avocet (Breeding)	104 pairs	74 pairs in 2019, 67 in 2020 and 59 pairs in 2021 (Suffolk Bird Group, 2022)	Unfavourable/ Restore	Breeding sites are at Havergate Island and Orford Ness including new habitat created in the Airfield.

Qualifying Feature	Baseline Reference Value	Current	Summary Condition/ Objective	Comments
Sandwich Tern (Breeding)	170 pairs	0 breeding pairs in 2019, 2020, 2021	Unfavourable/ Restore	The Sandwich Tern colony at Orford Ness was on Havergate Island but it was more or less abandoned in 1997, with nesting occurring only in some years with a maximum of 15 pairs in 2003.
Common Redshank (Non-Breeding)	1,919 individuals	2,134 individuals5-year peak mean 17/18-21/22 (WeBS) for the Alde Estuary	Favourable/ Maintain, except for disturbance from human activity and certain contaminants in the estuary sediment.	Reported from Havergate Island in winter and is likely to occur widely in the SPA. In addition, 42 pairs bred at Orfordness in 2019 which may contribute to the non-breeding population.
Pied Avocet (Non-Breeding)	766 individuals	1,552 individuals	Favourable/ Maintain, except for disturbance from human activity and certain contaminants in the estuary sediment.	Occurs at Havergate Island and elsewhere in the Estuary.
Ruff (Non-breeding)	13 individuals	2 individuals	Unfavourable/ Restore	Five were recorded at Havergate Island and eight at Butley (River?) in 2019, and one at Aldeburgh Marshes (adjacent to the Ramsar) in 2020.

4.1.38 The conservation objectives are to *"ensure that, subject to natural change, the integrity of the site is maintained or restored as appropriate, and that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring:*

- the extent and distribution of the habitats of the qualifying features
- the structure and function of the habitats of the qualifying features
- the supporting processes on which the habitats of the qualifying features rely
- the populations of each of the qualifying features
- the distribution of qualifying features within the site".

4.1.39 The conservation objectives are further defined by Supplementary Advice on Conservation Objectives (SACOs). These provide attributes and targets for each qualifying feature. These are feature specific however typically include the following attributes:

- Population abundance.
- Connectivity with supporting habitats.
- Disturbance caused by human activity.
- Supporting habitat: Extent, distribution, and availability of supporting habitat.
- Supporting habitat: Conservation measures.
- Supporting habitat: Air quality.
- Supporting habitat: Food availability.
- Supporting habitat: Hydrology.
- Supporting habitat: Landform & Landscape.
- Supporting habitat: Vegetation characteristics.
- Supporting habitat: Water depth.
- Supporting habitat: Water quality (contaminants, dissolved oxygen, nutrients, turbidity, salinity).

4.1.40 Natural England guidance states that "*Any proposals or operations which may affect the site or its features should be designed so they do not adversely affect any of the attributes in the SACO or achievement of the conservation objectives*".

ORFORDNESS - SHINGLE STREET SAC (UK0014780)

BRIEF DESCRIPTION

4.1.41 The Orfordness to Shingle Street SAC also overlaps with the Alde-Ore Estuary Ramsar. It encompasses the Orford Ness shingle spit and the coast at Shingle Street as far south as Bawdsey. The SAC was proposed in 1996 and formerly designated as an SAC in 2005.

QUALIFYING INTEREST

4.1.42 4.2.5 Further information on the qualifying features of the Orfordness to Shingle Street SAC for which LSE could not be excluded at Stage 1 Screening is provided in Table 4-7. The Baseline Reference Value is from the Standard Data Form and the condition assessment is based on an assessment undertaken by Natural England for the underpinning SSSI or the SACOs.

Table 4-7: Orfordness to Shingle Street SAC Qualifying Features Condition & Overall Objectives

Qualifying Feature	Baseline Reference Value	Current	Summary Condition/ Objective	Comments
1150 Coastal lagoons * Priority feature	26.64 ha	57.83ha	Unfavourable/ restore	Parts are unfavourable due to high levels of nutrients causing algal blooms, some of this may be attributable to sheep grazing.
1210 Annual vegetation of drift lines	9.77ha	N.D.	Unfavourable / Restore	Parts are unfavourable due to species composition and recreational pressure
1220 Perennial vegetation of stony banks	535.46 ha	535.86ha	Unfavourable / Restore	Parts are unfavourable due to species composition and recreational pressure

N.D. = no data

4.1.43 The site is 888.01ha in total; the main other habitats are coastal saltmarsh and coastal grazing marsh.

CONSERVATION OBJECTIVES

4.1.44 The conservation objectives are to "*ensure that the integrity of the site is maintained or restored as appropriate, and to ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;*

- The extent and distribution of qualifying natural habitats
- The structure and function (including typical species) of qualifying natural habitats, and
- The supporting processes on which qualifying natural habitats rely."

4.1.45 The conservation objectives are further defined by the SACOs. These provide attributes for each qualifying feature however no targets have yet been set for 1210 Annual vegetation of drift lines and 1220 Perennial vegetation of stony banks.

4.1.46 The attributes for 1150 Coastal lagoons * Priority feature are:

- Distribution: presence and spatial distribution of biological communities
- Extent and distribution
- Extent of water
- Structure and function: presence and abundance of key structural and influential species
- Structure: isolating barrier - presence, nature and integrity
- Structure: non-native species and pathogens (habitat)
- Structure: sediment composition and distribution
- Structure: species composition of component communities
- Structure: structure and integrity of lagoon banks
- Structure: water depth
- Supporting processes: eutrophication of sediments
- Supporting processes: physico-chemical properties (habitat)
- Supporting processes: sediment contaminants
- Supporting processes: water quality - contaminants (habitat)
- Supporting processes: water quality - nutrients (habitat)
- Supporting processes: water quality - turbidity (habitat)

4.1.47 The attributes for 1210 Annual vegetation of drift lines are:

- Distribution of the feature, including associated transitional habitats, within the site
- Extent of the feature within the site
- Future extent of habitat within the site and ability to respond to seasonal changes
- Structure and function (including its typical species): key structural, influential and distinctive species
- Structure and function: niches for seedling establishment
- Structure and function: nutrient availability
- Structure and function: sediment size range and type
- Structure and function: vegetation - undesirable species
- Structure and function: vegetation community composition
- Structure and function: vegetation structure - zonation and transitions
- Supporting processes: aeolian (wind-blown) processes
- Supporting processes: beach morphology and structure
- Supporting processes: conservation measures (habitat)
- Supporting processes: functionality and sediment supply including connectivity with the wider coastal sediment system
- Supporting processes: water quality (habitat)

4.1.48 The attributes for 1220 Perennial vegetation of stony banks are:

- Distribution of the feature, including associated transitional habitats, within the site
- Extent of the feature within the site

- Future extent of habitat within the site and ability to respond to seasonal changes
- Structure and function (including its typical species): key structural, influential and distinctive species
- Structure and function: functionality and sediment supply including connectivity with the wider coastal sediment system
- Structure and function: nutrient availability
- Structure and function: sediment size range and type
- Structure and function: vegetation - undesirable species
- Structure and function: vegetation community composition
- Structure and function: vegetation structure - patterns of vegetation with naturally bare ground
- Structure and function: vegetation structure - zonation and transitions
- Supporting processes: air quality (habitat)
- Supporting processes: conservation measures (habitat)
- Supporting processes: hydrology (habitat)
- Supporting processes: sedimentary processes
- Supporting processes: shingle morphology
- Supporting processes: water quality (habitat)

ALDE-ORE & BUTLEY ESTUARIES SAC (UK0030076)

BRIEF DESCRIPTION

4.1.49 The Alde-Ore & Butley Estuaries SAC also overlaps with the Alde-Ore Estuary Ramsar. It encompasses the estuaries and Havergate Island. The SAC was proposed in 1996 and formerly designated as an SAC in 2005.

QUALIFYING INTEREST

4.1.50 Further information on the qualifying features of the Alde-Ore & Butley Estuaries SAC for which LSE could not be excluded at Stage 1 Screening is provided in Table 4-8.

Table 4-8: Alde-Ore & Butley Estuaries SAC Qualifying Features Condition & Overall Objectives

Qualifying Feature	Baseline Reference Value	Current	Summary Condition/ Objective	Comments
1130 Estuaries	1142.84ha	N.D.	N.D.	
1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	408.16ha	402.36ha	Favourable/ Maintain	There may have been some losses of saltmarsh however the difference between the BRV and the most recent mapping may be due to map accuracy as it is slight.

CONSERVATION OBJECTIVES

4.1.51 The conservation objectives are to "ensure that the integrity of the site is maintained or restored as appropriate, and to ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats
- The structure and function (including typical species) of qualifying natural habitats, and
- The supporting processes on which qualifying natural habitats rely."

4.1.52 The conservation objectives are further defined by the SACOs. These provide attributes for each qualifying feature.

4.1.53 For 1130 Estuaries the attributes are:

- Distribution: presence and spatial distribution of biological communities
- Extent and distribution
- Function: connectivity
- Structure and function: presence and abundance of key structural and influential species
- Structure: freshwater sources
- Structure: habitat zonation
- Structure: morphology
- Structure: non-native species and pathogens (habitat)
- Structure: sediment movement, sources and sinks
- Structure: species composition of component communities
- Structure: substrate composition and distribution
- Structure: tidal regime
- Structure: topography
- Structure: water density
- Supporting processes: energy / exposure
- Supporting processes: sediment contaminants
- Supporting processes: water quality - dissolved oxygen (habitat)
- Supporting processes: water quality - nutrients (habitat)
- Supporting processes: water quality - turbidity (habitat)

4.1.54 For 1330 Atlantic salt meadows (Glauco-Puccinellietalia maritimae) the attributes are:

- Distribution of the feature, including associated transitional habitats, within the site
- Extent of the feature within the site
- Future extent of habitat within the site and ability to respond to seasonal changes
- Structure and function (including its typical species): key structural, influential and distinctive species
- Structure and function: presence and patterning of creeks and salt pans
- Structure and function: presence of unvegetated surfaces

- Structure and function: sediment size and availability
- Structure and function: surface elevation and topography
- Structure and function: vegetation - undesirable species
- Structure and function: vegetation community composition
- Structure and function: vegetation structure - zonation of salt marsh vegetation
- Supporting processes: adaptation and resilience (habitat)
- Supporting processes: air quality (habitat)
- Supporting processes: conservation measures (habitat)
- Supporting processes: functional connectivity with wider coastal sedimentary system
- Supporting processes: morphological setting
- Supporting processes: sediment nutrient status and nutrient cycling
- Supporting processes: sedimentary processes
- Supporting processes: tidal processes
- Supporting processes: water quality (habitat)

MINSMERE -WALBERSWICK RAMSAR UK11044

4.1.55 The qualifying interest species for Minsmere -Walberswick Ramsar are Bearded Tit (breeding), Eurasian Marsh Harrier (breeding), Eurasian Teal (breeding), Great Bittern (breeding), Gadwall (breeding), Northern Shoveler (breeding), and Pied Avocet (breeding).

4.1.56 The status of most of these species at Orford Ness is described in Table 4-5 and Table 4-6. For the others:

- Great Bittern may breed at the Butley River, and there are two records from Orford Ness from 2007. This is a rare species which is largely confined to reed beds.
- Gadwall is a regular winter visitor to Havergate Island and is occasionally reported from Orford Ness.
- Bearded Tit may breed at the Butley River, and there are records from Orford Ness from 2007. This species is largely confined to reed beds when breeding and remains strongly associated with wetlands year-round.

MINSMERE-WALBERSWICK SPA UK9009101

4.1.57 The qualifying interest species for Minsmere-Walberswick SPA are Eurasian Marsh Harrier (non-breeding), Eurasian Teal (breeding), European Nightjar (breeding), Gadwall (breeding), Great Bittern (breeding), Little Tern (breeding), Northern Shoveler (breeding), Pied Avocet (breeding), Gadwall (non-breeding), Hen Harrier (non-breeding), Great White-fronted Goose (non-breeding) and Northern Shoveler (non-breeding).

4.1.58 The status of most of these species at Orford Ness is described in Table 4-5, Table 4-6 and paragraph 4.1.56. European Nightjar and Great White-fronted Goose were ‘screened out’ at Stage 1. Single birds of Hen Harrier are reported almost annually from Orford Ness during the winter.

4.2 STEP TWO: EFFECTS OF THE PROJECT ALONE & IN COMBIMATION

STEP TWO, PART 1: EFFECTS OF THE PROJECT ALONE

FACTOR 1: DAMAGE TO QUALIFYING INTEREST HABITATS OR THE HABITATS OF QUALIFYING INTEREST FEATURES, INCLUDING TOPOGRAPHY, DURING FENCE INSTALLATION, MAINTENANCE AND REMOVAL, DURING THE INSTALLATION OF A DITCH CROSSING, AND DURING THE MANAGEMENT OF VEGETATION.

1150 COASTAL LAGOONS* (PRIORITY FEATURE)

4.2.1 Habitat 1150 Coastal Lagoons are not along the fence line, access tracks or within temporary works areas and therefore will not be damaged during fence installation, maintenance and removal, nor during the installation of a ditch crossing, nor during the management of vegetation. However, the banks along the ditches within the PCS in which the fence will be installed and in proximity to the ditch crossing may have a function in retaining water within some of the smaller coastal lagoons, see Figure 4.4. Therefore, damage to these banks could affect water levels within these lagoons.

1220 PERENNIAL VEGETATION OF STONY BANKS

4.2.2 The installation of the fence will result in disturbance and then reinstatement of 1m x 1350m of 1220 Perennial Vegetation of Stony Banks, giving a total 0.14ha (of 520ha at Orford Ness). The installation of the ditch crossing will mainly affect the ditch, however a small amount of shingle habitat on the ditch banks could also be affected (c. 6m^2).

4.2.3 The alignment of the fence on the eastern boundary and much of the western boundary is alongside ditches where it appears that material excavated from the ditch was placed. These areas have therefore been disturbed in the past[3] and have recovered to support the shingle communities described above. The northern part of the western boundary and the northern boundary have not been surveyed however it can be seen from aerial imagery that these cross areas of densely vegetated shingle which has also been disturbed by past human activity[4].

4.2.4 Importantly, the fence would not cross natural shingle ridges (as these have already been lost from the PCS location) and the perennial grass vegetation along the fence line would be expected to recover quickly, as it has along the fence line of Norfolk Projects enclosure which is located in the same habitat type (see Figure 4.6). However, lichens would take longer to re-establish their current extent on the re-disturbed shingle.

[3] The southern ditch is evident on maps dating from 1881, while the western (and central) ditch appears to date from the construction of the Cobra Mist AN/FPS-95 antenna in the last half of the1960s. The old fence line was probably installed at the same time; it is visible on aerial imagery from 2000 but not visible on aerial imagery from 1945.

[4] Aerial imagery from the 1970s shows total clearance of vegetation and vehicle tracks throughout this area; the tracks are still visible on modern aerial imagery. The area was apparently cleared and levelled during the construction of the Cobra Mist antenna, and then it recolonised with vegetation.

4.2.5 Vehicular access during construction, maintenance and management tasks also has the potential to damage shingle habitats. There are existing access tracks which lead directly to the PCS and therefore vehicles will access the PCS using these as far as possible. Any vehicles entering the PCS would then leave this track and traverse the shingle to enter the PCS via the new ditch crossing. As previously noted, the shingle here does not exhibit the natural ridges, having been levelled in the past, and the vehicle access would be infrequent, which much reduces the risk of damage.

Figure 4.6: Vegetation along existing predator fence.

BIRDS

4.2.6 Other than Eurasian Marsh Harrier, the habitat along the fence line is not suitable for the qualifying feature birds. The area affected by the fence line installation is a very small fraction of a Eurasian Marsh Harrier home range and the temporary disturbance to this area could not affect the Eurasian Marsh Harrier population.

SCARCE/UNCOMMON PLANTS

4.2.7 There were no uncommon plants recorded during the survey. However, the habitat is suitable for some species, see Table 4-3. These are all annuals and therefore less vulnerable than perennials to temporary disturbance of the shingle through fence installation in the location of the PCS, especially after setting seed.

SCARCE/UNCOMMON INVERTEBRATES

4.2.8 There is suitable habitat for uncommon invertebrates along the fence line including the three spiders *Pseudeuophrys obsoleta*, *Haplodrassus minor* and *Trichoncus affinis*, the first of these was recorded during surveys. The surveys indicate that the wooden poles and railway sleepers which are scattered on and around the Survey Areas were of value to uncommon invertebrates, with animals taking refuge under these. Installing the fence will result in disturbance to the shingle and could necessitate moving wooden items but not their removal. Given the localised and temporary nature if the works, populations of invertebrates are unlikely to be affected.

FACTOR 2: DIRECT MORTALITY OF QUALIFYING INTEREST ANIMALS AND PLANTS DURING FENCE INSTALLATION, MAINTENANCE AND REMOVAL, AND DURING THE INSTALLATION OF A DITCH CROSSING AND WHEN UNDERTAKING MANAGEMENT OF VEGETATION.

BREEDING BIRDS

4.2.9 It is intended that the works to install, maintain and remove the fence (and the ditch crossing), and undertake vegetation management, take place during the winter. If these are undertaken during the bird breeding season, there is a risk of damaging bird nests and destroying eggs. This only applies to the qualifying interest bird species which could nest at or near the PCS, which is Common Redshank, Eurasian Teal, Eurasian Marsh Harrier, Lesser Black-backed Gull, and Pied Avocet, with none known to nest at this location currently and are unlikely to do so. However, the aim is to establish a nesting colony of Lesser Black-backed Gull within the PCS which would be present during maintenance and decommissioning.

SCARCE/UNCOMMON PLANTS & INVERTEBRATES

4.2.10 During the installation, maintenance and removal of the fence, and the installation of the ditch crossing, there is a risk that scarce/uncommon plants and invertebrates suffer direct mortality. However, this is very unlikely to affect the overall population of these species. There is a similar risk during the management of vegetation, however this is overall likely to increase populations of scarce/uncommon plants and invertebrates by creating open habitats.

FACTOR 3: DISTURBANCE OF QUALIFYING INTEREST BIRDS DUE TO THE PRESENCE OF WORKERS DURING FENCE INSTALLATION, MAINTENANCE AND REMOVAL, DURING THE INSTALLATION OF A DITCH CROSSING, AND WHEN UNDERTAKING VEGETATION MANAGEMENT.

BREEDING BIRDS

4.2.11 As already mentioned, it is intended that the works to install, maintain and remove the fence (and the ditch crossing), and undertake vegetation management, take place during the winter. If these activities occurred during the summer, there is a risk of disturbing breeding birds. Of those listed as qualifying features, as set out in Table 4-5, Table 4-6 and listed in paragraphs 4.1.55 and 4.1.57, only Eurasian Marsh Harrier is likely to breed near the PCS although the available data suggests this species prefers nesting in the saltmarsh habitat. Common Redshank, Eurasian Teal, Pied Avocet and, in the future, Lesser Black-backed Gull may also nest nearby.

WINTERING BIRDS

4.2.12 It is intended that installation of the fence and ditch crossing will involve the presence of workers and plant for six weeks during the winter. The workforce will disturb birds during the works; Common Redshank (two or three), Grey Heron (one), Little Egret (one) were all disturbed during the survey work in January, and Eurasian Teal (30) were present in October. Eurasian Marsh Harrier was also observed however this species did not appear to respond to our presence. A similar level of disturbance would be expected during each day of fence installation however this is would not result in significant disturbance for any of these species[5] (or any other bird species listed in Table 4.4, Table 4.5 and paragraphs 4.1.55 and 4.1.56) because the disturbance will be localised and of short duration. The same applies for monitoring, management and maintenance activities, as well as removal of the fence when it is no longer required.

FACTOR 4: RELEASE OF SUSPENDED SOLIDS AND OTHER POLLUTION INTO WATERWAYS DURING FENCE INSTALLATION, MAINTENANCE AND REMOVAL, DURING THE INSTALLATION OF A DITCH CROSSING, AND WHEN UNDERTAKING VEGETATION MANAGEMENT.

4.2.13 Disturbance of the ground when installing the fence and ditch crossing could release organic matter buried in the ground and construction and maintenance machinery may leak oils and other contaminants. In both cases the amounts will be tiny and unlikely to have an appreciable effect on any of the qualifying features.

FACTOR 5: SPREAD OF NON-NATIVE INVASIVE SPECIES AND PATHOGENS BY BRINGING THESE ON TO SITE ON CONSTRUCTION AND MAINTANANCE MACHINERY OR MATERIALS AND WORKERS CLOTHING.

4.2.14 There is a low risk that machinery and materials brought onto the PCS for the works is contaminated with invasive non-native species which then become established and spread, with negative effects on Orford Ness, especially its flora including scarce/uncommon plant species. There are already non-native species present in the Survey Areas, and these may be spread by construction activity. Similarly, there is risk of spreading pathogens such as Highly Pathogenic Avian Influenza which impacts bird populations.

FACTOR 6: REMOVAL OF GAZING ANIMALS FROM THE PCS, AFFECTING VEGETATION COMPOSITION.

H1220 1150 COASTAL LAGOONS* (PRIORITY FEATURE)

4.2.15 The vegetation within the saline lagoons does not appear to be grazed or dependent on grazing to maintain its community structure and composition, while the ditches generally lack vegetation.

[5] Defined as disturbance which will cause impacts on populations of a species through either (i) changed local distribution on a continuing basis; and/or (ii) changed local abundance on a sustained basis; and/or (iii) the reduction of ability of any significant group of birds to survive, breed, or rear their young.

1220 PERENNIAL VEGETATION OF STONY BANKS

4.2.16 The enclosure will exclude two or three species of gazing animals as well as the intended predator (although Chinese Water Deer may fit into both categories as there is evidence that this species eats the eggs of ground nesting birds). The grazing animals appear to have a moderate effect on the vegetation, creating variability in sward height and species composition. Removal of grazing may promote a denser sward of tall perennial grasses at the expense of more open areas and associated flora and lichens, with the open areas being of greater conservation importance.

BIRDS

4.2.17 Other the Eurasian Marsh Harrier, the grassland areas are not favourable to the bird species that are of special interest (as listed in Table 4-5, Table 4-6, and paragraphs 4.1.55 to 4.1.58) and therefore these species are unlikely to be affected by the removal of grazing; the saline water apparently keeps areas in and around the lagoons clear of dense perennial vegetation without the need for grazing. Eurasian Marsh Harrier hunts over dense vegetation and therefore it is also unlikely to be affected.

SCARCE/UNCOMMON PLANTS

4.2.18 The scarce and uncommon plants are smaller species which may benefit from light grazing; removal of grazing could result in a decline of these species if present, e.g. the small clovers.

SCARCE/UNCOMMON INVERTEBRATES

4.2.19 The spiders *Haplodrassus minor* and *Trichoncus affinis*, if present, may be affected by cessation of grazing as these prefer open habitats. The species associated with lagoons would not be affected, however.

FACTOR 7: INCREASES IN NUTRIENTS FROM BIRD FAECES AFFECTING VEGETATION COMPOSITION AND WATER QUALITY.

1150 COASTAL LAGOONS* (PRIORITY FEATURE)

4.2.20 The introduction of breeding gulls into the PCS will increase nutrients within the saline lagoons and potentially lead to changes in the plant and animal communities present.

1220 PERENNIAL VEGETATION OF STONY BANKS

4.2.21 Similarly, the introduction of breeding gulls into the PCS will increase nutrients within the shingle due to bird droppings; this may favour coarse grasses at the expense of smaller flowering plants and therefore change the vegetation community composition or relative abundance. Although there was historically 25,000 LBBG nesting on Orford Ness, this was in a different location.

BIRDS

4.2.22 Several of the bird species forage in water and therefore changes in water quality may affect these species however this may not be negative as increases in nutrients may increase the abundance of prey. Only severe pollution which causes prey items to decline is likely to affect the bird populations negatively.

SCARCE/UNCOMMON PLANTS & INVERTEBRATES

4.2.23 Any change in vegetation structure and composition arising from increased nutrients, may affect the other ecological features with some potentially benefitting and others potentially declining, such as scarce/uncommon plants and invertebrates.

FACTOR 8: CHANGES IN WATER FLOWS CAUSED BY FENCE LINES ACROSS DITCHES.

4.2.24 Surface water drainage for the site will not change as there will be no new impermeable surface areas added as a result of the development proposals.

4.2.25 Design of the proposed predator proof fencing may include the crossing of existing drainage channels within the PCS. These channels are likely to be tidally influenced and depending on the design of the mesh used on the fencing, have the potential to become blinded by debris. Any build-up of debris within an existing channel will restrict flow and increase the risk of erosion at the wetted perimeter of the channel. If completely blocked, water would pass over or around the sides of the blockage in order to maintain flow to the downstream reach. This change in channel hydrology would be localised, however prolonged erosion could lead to degradation of the fence integrity and damage to '1220 Perennial Vegetation of Stony Banks' habitats at the ditch crossing point.

STEP TWO, PART 2: EFFECTS OF THE PROJECT IN COMBINATION

4.2.26 The Norfolk Projects compensation area is an existing area enclosed by predator control fencing at Orford Ness. This has the potential to give rise to the same effects during operation as the PCS, namely changes in the vegetation and ecology of the enclosed areas through cessation of grazing and increase in nutrients. It is understood that in the 2023 breeding season gulls have not bred within the Norfolk Projects compensation area and therefore not resulted in nutrient increases. The changes in the vegetation through excluding grazing animals are evident at the Norfolk Projects compensation area, despite the commitment to manage the vegetation therein.

4.2.27 The addition of the PCS would increase the area of Orford Ness with reduced grazing intensity (and potentially) increases in nutrients with possible negative effects on the flora, unless managed.

4.2.28 No other projects have been identified which could affect the same ecological features as the PCS.

STEP TWO, PART 3: ASSESSMENT OF EFFECTS ON CONSERVATION OBJECTIVES

ALDE-ORE ESTUARY RAMSAR (UK11002)

4.2.29 An assessment of the potential of the Project to undermine the implied conservation objectives of the Alde-Ore Estuary Ramsar is presented in Table 4-9, Table 4-10 and Table 4-11, considering only those features for which LSE could not be excluded at Stage 1 Screening. The relevant impact factor is given in brackets.

Table 4-9: Risks of Undermining the Implied Conservation Objectives for Scarce Plants

Implied Conservation Objective	For the Project 'Alone'	For the Project 'In Combination'
The extent and distribution of habitats of the qualifying species.	No risk; the project would not change the extent or distribution of the habitats of the qualifying species of plants.	-
The structure and function of the habitats of the qualifying species.	Medium risk; the removal of grazing could allow coarser vegetation to predominate (Impact Factor 6), an additional risk is posed by invasive non-native species (Impact Factor 5).	Additional risk associated with the Norfolk Projects area.
The populations of each of the qualifying species.	Coarse vegetation could outcompete some of the scarce species. This could affect Bur Meddick, Curved Hard-grass, Perennial Glasswort, Suffocated clover and Yellow-vetch, if these occur within the PCS. Invasive species could affect any of the qualifying species inside and outside the PCS.	Additional risk associated with the Norfolk Projects area.
The distribution of qualifying species within the site.	In the worst case, the effects outlined above could result in losses of these species within the PCS or hinder their restoration to this area.	Additional risk associated with the Norfolk Projects area.

Table 4-10: Risks of Undermining the Implied Conservation Objectives for Scarce Invertebrates

Implied Conservation Objective	For the Project 'Alone'	For the Project 'In Combination'
The extent and distribution of habitats of the qualifying species.	No risk; the project would not change the extent or distribution of the habitats of the qualifying species of invertebrates.	-
The structure and function of the habitats of the qualifying species.	Medium risk; the removal of grazing could allow coarser vegetation to predominate within the PCS (6). An additional risk is posed by invasive non-native species of plants which could also change the vegetation structure in terrestrial habitats within the PCS and elsewhere (5). A further risk (for the aquatic species) is posed by changes in water quality arising from increased nutrients from bird faeces should a gull colony become established (7).	Additional risk associated with the Norfolk Projects area.
The populations of each of the qualifying species.	Changes in the vegetation structure could affect the populations of, for example, Shingle Yellow-face Bee, and the spiders *Haplodrassus minor* and *Trichoncus affinis.* Changes in water quality could affect the populations of Starlet sea anemone and the Lagoon sand shrimp (however these species have not been recorded at the PCS).	Additional risk associated with the Norfolk Projects area.
The distribution of qualifying species within the site.	In the worst case, the effects outlined above could result in losses of these species within the PCS or hinder their restoration to this area.	Additional risk associated with the Norfolk Projects area.

Table 4-11 Risks of Undermining the Implied Conservation Objectives for Birds

Implied Conservation Objective	For the Project 'Alone'	For the Project 'In Combination'
The extent and distribution of the habitats of the qualifying features.	Low risk; the project would not change the extent or distribution of the habitats of the qualifying species of bird unless the shingle banks around saline lagoons are damaged (1).	-
The structure and function of the habitats of the qualifying features.	Low risk arising from changes in water quality due to changes in the vegetation surrounding the saline lagoons in the PCS due to removal of grazers (6), pollution (4) and increases in nutrients (7) for breeding Little Tern (hunting only) and Pied Avocet, and non-breeding Common Greenshank, Common Redshank, Eurasian Teal, Pied Avocet, and Spotted Redshank. Other species are much less likely to be affected by these factors (Common Shelduck, Northern Pintail and Northern Shoveler) or could not (Black-tailed Godwit, Mediterranean Gull and Sandwich Tern) as the habitat within and near the PCS is not favourable or unsuitable. Eurasian Marsh Harrier is much more likely to nest in reedbed habitat than among the grasses within the PCS; it favours dense vegetation for nesting and would only be affected by changes in water quality if this reduced prey abundance. The aim of the Project is to improve the breeding habitat for Lesser Black-backed Gull.	No additional risk as the Norfolk Projects area does not include saline lagoons or other habitat that could be used as roosting and feeding sites for these species.
The supporting processes on	No risk; the project would not change the supporting	-

Implied Conservation Objective	For the Project 'Alone'	For the Project 'In Combination'
which the habitats of the qualifying features rely.	processes on which the habitats of the qualifying features rely.	
The populations of each of the qualifying features.	Very low risk of nest destruction of Pied Avocet and Eurasian Marsh Harrier (and Lesser Black-Backed Gull, once established) (2) and very low risk of significant disturbance affecting breeding populations of Eurasian Marsh Harrier, Little Tern and Pied Avocet (3). The Project activity during the winter is not sufficient to cause significant disturbance. A further low risk arises from the spread of Invasive Non-Native Species of plant and pathogens, such as Avian Influenza, which could arrive on equipment and machinery, and workers clothing (5). The former could adversely affect nesting habitat of e.g. terns and the latter could affect any of the listed bird species that occur near the PCS.	Elevated risk when considered with other activity at Orford Ness, but still low.
The distribution of qualifying features within the site.	In the worst case, breeding Little Tern (hunting only) and Pied Avocet and non-breeding Common Greenshank, Common Redshank Eurasian Teal, Pied Avocet, and Spotted Redshank would cease using the saline lagoons within the PCS, or hinder the restoration of these species to this area. The distribution of the other species would not be affected.	No additional risk as the Norfolk Projects area does not include saline lagoons or other habitat that could be used as roosting and feeding sites for these species.

ALDE-ORE ESTUARY SPA (UK9009112)

4.2.30 An assessment of the potential of the Project to have an adverse impact on the Attributes and therefore undermine the conservation objectives of the Alde-Ore Estuary SPA is presented in Table 4-12, Table 4-13, Table 4-14, Table 4-15, Table 4-16, Table 4-17, Table 4-18 and Table 4-19.

Table 4-12: Risk of Adverse Effects on the Attributes for Eurasian Marsh Harrier (breeding)

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Breeding population: abundance.	The project is located away from the known breeding habitat and any degradation of supporting habitats is very unlikely to affect the breeding population.	Very low risk based derived from the risks identified below.
Connectivity with supporting habitats.	No risk, the project will not prevent safe passage of birds moving between nesting, roosting and feeding areas.	-
Disturbance caused by human activity.	Low risk of increased disturbance due to presence of site workers to install, maintain and remove the fence, however it is unlikely to result in significant disturbance (3).	Elevated risk when considered with other activity at Orford Ness, but still low.
Predation - all habitats.	Low risk; the Project would not directly increase predation of Eurasian Marsh Harrier chicks, however if adult birds are disturbed from the nest then this could make chicks more vulnerable to predation (3).	Additional risk from maintenance at the Norfolk Projects area.
Productivity.	Very low risk; only in the worst-case scenario would the populations of prey species be negatively affected by aquatic pollution, INNS or pathogens, and there would be an increase in predation of Eurasian Marsh Harrier chicks (see above) (5). There is a very low risk of workers accidentally destroying eggs or nests of this species (2).	Additional risk from maintenance at the Norfolk Projects area.
Pathogens.	Low risk; the Project is unlikely to result in the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, however it is possible that it would be spread by workers at the PCS.	Additional risk from maintenance at the Norfolk Projects area.

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Supporting habitat: air quality.	No risk; the Project will have no appreciable risk for air quality.	-
Supporting habitat: conservation measures.	No risk; the Project will not hinder the ability to undertake habitat management within the SPA.	-
Supporting habitat: extent, distribution and availability of supporting habitat for the breeding season.	No risk; the Project will not change the availability of reed beds and other supporting habitats.	-
Supporting habitat: food availability.	Very low risk; only in the worst-case scenario would the populations of prey species be negatively affected by aquatic pollution, INNS or pathogens (4, 7 and 5).	-
Supporting habitat: landscape - reed beds.	No risk; as there is no reedbed habitat present within or near the PCS.	-
Supporting habitat: vegetation characteristics for nesting.	No risk; as there is no reedbed habitat present within near the PCS.	-
Supporting habitat: water depth.	No risk; as there is no reedbed habitat present within near the PCS.	-
Supporting habitat: water quality – contaminants.	Very low risk from leaks from construction and maintenance machinery (4). Despite the inclusion of this attribute, Eurasian Marsh Harrier is not very sensitive to water quality changes.	Additional risk from maintenance machinery used at the Norfolk Projects area.
Supporting habitat: water quality - dissolved oxygen.	Very low risk as a result of suspended solid pollution arising from construction activity affecting saline lagoons within the PCS (4). Additional risk arising from bird faeces should a gull colony become established within the PCS (7). Despite the	Additional risk should a gull colony establish in the Norfolk Projects area.

Attribute	For the Project 'Alone'	For the Project 'In Combination'
	inclusion of this attribute, Eurasian Marsh Harrier is not very sensitive to water quality changes.	
Supporting habitat: water quality – nutrients.	As for dissolved oxygen.	As for dissolved oxygen.
Supporting habitat: water quality – turbidity.	As for dissolved oxygen.	As for dissolved oxygen.

Table 4-13: Risk of Adverse Effects on the Attributes for Lesser Black-backed Gull (breeding)

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Breeding population: abundance.	The aim of the Project is to contribute towards the restoration of the population.	-
Connectivity with supporting habitats.	No risk; the Project will not prevent the safe passage of birds moving between nesting and feeding areas.	-
Disturbance caused by human activity.	Very low risk; this species is not sensitive to disturbance and whilst this could occur during maintenance and during fence removal, it is unlikely to result in significant disturbance (3).	Elevated risk when considered with other activity at Orford Ness, but still very low.
Predation - all habitats.	No risk; the aim of the Project is to reduce predation.	-
Pathogens.	Low risk, the Project is unlikely to result in the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, however it is possible that it would be spread by workers at the PCS (5).	Additional risk from maintenance at the Norfolk Projects area.
Supporting habitat: air quality.	No risk; the Project will have no appreciable risk for air quality.	-

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Supporting habitat: conservation measures.	No risk; the Project will not hinder the ability to undertake habitat management within the SPA.	-
Supporting habitat: extent, distribution and availability of supporting habitat for the breeding season.	No risk; the aim of the Project is to increase the area of breeding habitat and would not adversely affect other habitats used by this species.	-
Supporting habitat: food availability (bird).	No risk; the populations of prey species would not be negatively affected by the PCS.	-
Supporting habitat: vegetation characteristics for nesting.	No risk; the aim of the Project is to improve nesting habitat for this species.	-
Supporting habitat: water quality – contaminants.	Very low risk from leaks from construction and maintenance machinery (4).	Additional risk from maintenance machinery used at the Norfolk Projects area.
Supporting habitat: water quality - dissolved oxygen.	Very low risk as a result of suspended solid pollution arising from construction activity affecting saline lagoons within the PCS (4). Additional risk arising from bird faeces should a gull colony become established within the PCS (7).	Additional risk should a gull colony establish in the Norfolk Projects area.
Supporting habitat: water quality – nutrients.	As for dissolved oxygen.	As for dissolved oxygen.
Supporting habitat: water quality – turbidity.	As for dissolved oxygen.	As for dissolved oxygen.

Table 4-14: Risk of Adverse Effects on the Attributes for Little Tern (breeding)

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Breeding population: abundance.	Very low risk that the project would hinder the ability to restore the breeding colony at Orford	-

Attribute	For the Project 'Alone'	For the Project 'In Combination'
	Ness, derived from the other risks identified, noting that there is currently no Little Tern colony within the SPA.	
Connectivity with supporting habitats.	No risk; the Project would not affect the passage of birds moving between nesting and feeding areas.	-
Disturbance caused by human activity.	Very low risk; possibility that workers put off birds prospecting for nest sites within the SPA during construction maintenance, management and decommissioning activities (3).	Elevated risk when considered with other activity at Orford Ness, but still low.
Pathogens.	Low risk, the Project is unlikely to result in the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, however it is possible that it would be spread by workers at the PCS (7).	Additional risk from maintenance at the Norfolk Projects area.
Predation - all habitats.	As there are no existing nesting colonies within the PCS, there is no risk that predators will be diverted to any Little Tern colony once excluded from the PCS.	-
Productivity.	Low risk, derived from the other risks identified (disturbance and water quality), noting that there is currently no Little Tern colony within the SPA.	Elevated risk when considered with other activity at Orford Ness, but still low.
Supporting habitat: air quality.	No risk; the Project will have no appreciable risk for air quality.	-
Supporting habitat: conservation measures.	No risk; the Project will not hinder the ability to undertake habitat management within the SPA.	-
Supporting habitat: extent, distribution and availability of supporting habitat for the breeding season.	No risk; the Project would not affect beaches which are typically used by Little Tern for nesting or the estuarine and marine habitats that are typically used for hunting fish.	-

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Supporting habitat: food availability (bird).	Very low risk; the Project could have little effect on the availability of food for Little Tern, which was recorded foraging in the estuary and offshore. Only in the worst-case scenario would it affect Little Tern hunting for food in the lagoons within or near the PCS, even then, these small, shallow lagoons could not be a primary source of food for this species (4 and 7).	No additional risk as the Norolk Project area does not include saline lagoons.
Supporting habitat: landform.	No risk; the Project would not affect the gradient of beaches which are typically used by Little Tern for nesting.	-
Supporting habitat: vegetation characteristics for nesting.	Very low risk; the introduction of INNS could affect the nesting habitat for this species (5).	Additional risk from maintenance at the Norfolk Projects area.
Supporting habitat: water quality – contaminants.	Very low risk from leaks from construction and maintenance machinery (4).	Additional risk from maintenance machinery used at the Norfolk Projects area
Supporting habitat: water quality - dissolved oxygen.	Very low risk; as a result of suspended solid pollution arising from construction activity affecting saline lagoons within the PCS (4). Additional risk arising from bird faeces should a gull colony become established within the PCS (7).	Additional risk should a gull colony establish in the Norfolk Projects area.
Supporting habitat: water quality – nutrients.	As for dissolved oxygen.	As for dissolved oxygen.
Supporting habitat: water quality – turbidity.	As for dissolved oxygen.	As for dissolved oxygen.

Table 4-15: Risk of Adverse Effects on the Attributes for Pied Avocet (breeding)

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Breeding population: abundance.	The project is located away from the known Pied Avocet breeding colonies however any degradation of supporting habitats could ultimately affect the breeding population, for which see below.	Low risk based derived from the risks identified below.
Connectivity with supporting habitats.	No risk; the Project would not affect the safe passage of birds moving between nesting, roosting and feeding areas.	-
Disturbance caused by human activity.	Low risk of increased disturbance due to presence of site workers to install, maintain and decommission the fence, and undertake vegetation management however it is unlikely to result in significant disturbance (3).	Elevated risk when considered with other activity at Orford Ness, but still low.
Pathogens.	Low risk, the Project is unlikely to result in the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, however it is possible that it would be spread by workers at the PCS (5).	Additional risk from maintenance at the Norfolk Projects area.
Predation - all habitats.	As there are no existing nesting colonies within the PCS, there is no risk that predators will be diverted to the Pied Avocet colony once excluded from the PCS.	-
Productivity.	The project is located away from the known Pied Avocet breeding colonies however degradation of supporting habitats could ultimately affect the productivity of the breeding colony, for which see below.	No additional risk as the Norfolk Projects area does not include saline lagoons and the fence is already installed.
Supporting habitat: air quality.	No risk; the Project will have no appreciable risk for air quality.	-

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Supporting habitat: conservation measures.	No risk; the Project will not hinder the ability to undertake habitat management within the SPA.	-
Supporting habitat: extent, distribution and availability of supporting habitat for the breeding season.	Low risk; the Project will not affect the extent, distribution and availability of supporting habitat for the breeding season unless the banks supporting saline lagoons were damaged (1).	No additional risk as the Norfolk Projects area does not include saline lagoons.
Supporting habitat: food availability.	Low risk which is derived from the risk to water quality from construction activity (4) and bird faeces should a gull colony establish (7).	Additional risk arising from a gull colony at the Norfolk Projects area.
Supporting habitat: hydrology/ flow within standing water.	No risk; as only localised effects at the ditch crossing points could occur which would not affect Pied Avocet breeding habitat.	-
Supporting habitat: landform.	No risk of affecting the availability of shallow sloping nesting sites, as the PCS is located away from the known breeding sites for Pied Avocet.	-
Supporting habitat: landscape.	Low risk due to changes in grazing around the lagoons within the PCS (6), potentially affecting the area of open and unobstructed terrain around roosting and feeding sites.	No additional risk as the Norfolk Projects area does not include saline lagoons which could be used as roosting and feeding sites for Pied Avocet.
Supporting habitat: salinity.	No risk; the Project could not affect the salinity in the saline lagoons within the PCS or elsewhere.	-
Supporting habitat: vegetation characteristics for nesting.	No risk; the project could not affect the vegetation around the known nesting sites for Pied Avocet.	-
Supporting habitat: water depth.	No risk; as only localised effects at the ditch crossing points could occur which would not affect Pied Avocet breeding habitat.	-

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Supporting habitat: water quality – contaminants.	Very low risk from leaks from construction and maintenance machinery (4).	Additional risk from maintenance machinery used at the Norfolk Projects area
Supporting habitat: water quality - dissolved oxygen.	Very low risk as a result of suspended solid pollution arising from construction activity affecting saline lagoons within the PCS (4). Additional risk arising from bird faeces should a gull colony become established within the PCS (7).	Additional risk should a gull colony establish in the Norfolk Projects area.
Supporting habitat: water quality – nutrients.	As for dissolved oxygen.	As for dissolved oxygen.
Supporting habitat: water quality – turbidity.	As for dissolved oxygen.	As for dissolved oxygen.

Table 4-16: Risk of Adverse Effects on the Attributes for Sandwich Tern (breeding)

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Breeding population: abundance.	Very low risk that the Project will not hinder the ability to restore the breeding population, arising from the spread of INNS and pathogens, for which see below.	-
Connectivity with supporting habitats.	No risk; the Project will not affect safe passage of birds moving between nesting and feeding areas.	-
Disturbance caused by human activity.	No risk; the nesting colonies were not in proximity to the PCS and this species forages at sea.	-
Predation - all habitats.	No risk; the Project will not affect predation of Sandwich Tern chicks.	-
Productivity.	No risk; the Project will not affect predation of Sandwich Tern chicks or the availability of food, as this species hunts at sea.	-

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Pathogens.	Low risk, the Project is unlikely to result in the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, however it is possible that such diseases would be spread by workers at the PCS.	Additional risk from maintenance at the Norfolk Projects area.
Supporting habitat: air quality.	No risk; the Project will have no appreciable risk for air quality.	-
Supporting habitat: conservation measures.	No risk; the Project will not hinder the ability to undertake habitat management within the SPA.	-
Supporting habitat: extent, distribution and availability of supporting habitat for the breeding season.	Low risk; the Project would not reduce the habitat for this species unless the banks supporting saline lagoons were damaged (1).	No additional risk as the Norfolk Projects area does not include saline lagoons.
Supporting habitat: food availability	No risk; the Project would not reduce the food availability for this species, which hunts for fish at sea.	
Supporting habitat: landform	No risk; the Project would not affect the gradient of habitats which are used by this species for nesting.	
Supporting habitat: vegetation characteristics for nesting	Very low risk; the introduction of INNS could affect the nesting habitat for this species.	Additional risk from maintenance at the Norfolk Projects area.
Supporting habitat: water quality - contaminants	No risk; that lagoons within and near the PCs are not suitable for this species.	-
Supporting habitat: water quality - dissolved oxygen	No risk; that lagoons within and near the PCs are not suitable for this species.	-
Supporting habitat: water quality - nutrients	No risk; that lagoons within and near the PCs are not suitable for this species.	-

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Supporting habitat: water quality - turbidity	No risk; that lagoons within and near the PCs are not suitable for this species.	-

Table 4-17: Risk of Adverse Effects on the Attributes for Common Redshank (non-breeding)

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Non-breeding population: abundance	Low risk; the low risks set out below for the attributes are unlikely to affect the non-breeding population of redshank.	Elevated risk when considered with other activity at Orford Ness, but still low.
Connectivity with supporting habitats	No risk; the Project would not affect the passage of birds moving between roosting and feeding areas.	-
Disturbance caused by human activity	Low risk; as Common Redshank are known to occur within the PCS, disturbance of a few individuals during construction, management, maintenance and decommissioning activity is likely however this is unlikely to result in significant disturbance (3).	Elevated risk when considered with other activity at Orford Ness, but still low.
Pathogens	Low risk, the Project is unlikely to result in the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, however it is possible that it would be spread by workers at the PCS (5).	Additional risk from maintenance at the Norfolk Projects area.
Supporting habitat: air quality	No risk; the Project will have no appreciable risk for air quality.	-
Supporting habitat: conservation measures	No risk; the Project will not hinder the ability to undertake habitat management within the SPA.	-

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Supporting habitat: extent, distribution and availability of supporting habitat for the non-breeding season	No risk; the Project will not affect the extent, distribution and availability of supporting habitat for the non-breeding season.	-
Supporting habitat: food availability (bird)	Low risk which is derived from the risk to water quality from construction and decommissioning activity (4) and bird faeces should a gull colony become established (7).	Additional risk should a gull colony establish in the Norfolk Projects area.
Supporting habitat: hydrology/flow within grassland (marsh)	No risk, the Project will not affect the hydrology of freshwater marsh.	-
Supporting habitat: hydrology/flow within intertidal	No risk; the Project will not affect the hydrology of the intertidal.	-
Supporting habitat: landform	No risk; the Project would not affect the availability of channel networks within intertidal feeding areas and shallow slope gradients to the length/perimeter of ditches, drains, pools and scrapes.	-
Supporting habitat: landscape	Low risk; removal of grazing within the PCS could reduce the openness of the terrain around the saline lagoons within the PCS (6).	No additional risk as the Norfolk Projects area does not include saline lagoons.
Supporting habitat: vegetation characteristics for nesting	Low risk; removal of grazing within the PCS could affect the vegetation structure (6).	Additional risk as grazers are also excluded from the Norfolk Projects area.
Supporting habitat: vegetation characteristics for roosting	No risk; the PCS is not a known roosting site for Common Redshank.	-
Supporting habitat: water depth	No risk; as only localised effects at the ditch crossing points could occur which would not	-

Attribute	For the Project 'Alone'	For the Project 'In Combination'
	affect Common Redshank foraging habitat.	
Supporting habitat: water quality - contaminants	Very low risk from leaks from construction and maintenance machinery (4).	Additional risk from maintenance machinery used at the Norfolk Projects area
Supporting habitat: water quality - dissolved oxygen	Very low risk as a result of suspended solid pollution arising from construction and decommissioning activity affecting saline lagoons within the PCS (4). Additional risk arising from bird faeces should a gull colony become established within the PCS (7).	Additional risk should a gull colony establish in the Norfolk Projects area.
Supporting habitat: water quality - nutrients	As for dissolved oxygen.	As for dissolved oxygen.
Supporting habitat: water quality - turbidity	As for dissolved oxygen.	As for dissolved oxygen.

Table 4-18: Risk of Adverse Effects on the Attributes for Pied Avocet (Non- Breeding)

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Non-breeding population: abundance	Low risk based derived from the risks identified below.	Low risk based derived from the risks identified below.
Connectivity with supporting habitats	No risk; the Project would not affect the safe passage of birds moving between roosting and feeding areas.	-
Disturbance caused by human activity	Low risk of increased disturbance due to presence of site workers to install, maintain and decommission the fence, and undertake vegetation management (3), however it is unlikely to result in significant disturbance.	Elevated risk when considered with other activity at Orford Ness, but still low.

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Pathogens	Low risk, the Project is unlikely to result in the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, however it is possible that it would be spread by workers at the PCS.	Additional risk from maintenance at the Norfolk Projects area.
Supporting habitat: air quality	No risk; the Project will have no appreciable risk for air quality.	-
Supporting habitat: conservation measures	No risk; the Project will not hinder the ability to undertake habitat management within the SPA.	-
Supporting habitat: extent, distribution and availability of supporting habitat for the non-breeding season	No risk; the Project will not affect the extent, distribution and availability of supporting habitat for the non-breeding season.	-
Supporting habitat: food availability (bird)	Low risk which is derived from the risk to water quality from construction and decommissioning activity (4) and bird faeces should a gull colony become established (7).	Additional risk should a gull colony establish in the Norfolk Projects area.
Supporting habitat: hydrology/flow within intertidal	No risk; the Project could not affect the hydrology of the intertidal zone.	-
Supporting habitat: hydrology/flow within standing water	No risk; as only localised effects at the ditch crossing points could occur which would not affect Pied Avocet foraging habitat.	-
Supporting habitat: landform	No risk; as only localised effects at the ditch crossing points could occur which would not affect Pied Avocet foraging habitat.	-
Supporting habitat: landscape	Low risk due to changes in grazing around the lagoons within the PCS, potentially affecting the area of open and	No additional risk as the Norfolk Projects area does not include saline lagoons which could be used as roosting and feeding sites for Pied Avocet.

Attribute	For the Project 'Alone'	For the Project 'In Combination'
	unobstructed terrain around roosting and feeding sites (6).	
Supporting habitat: salinity	No risk; the Project could not affect the salinity in the saline lagoons within the PCS or elsewhere.	-
Supporting habitat: vegetation characteristics for nesting	No risk; the project could not affect the vegetation around the known nesting sites for Pied Avocet.	-
Supporting habitat: water depth	No risk; as only localised effects at the ditch crossing points could occur which would not affect Pied Avocet foraging habitat.	-
Supporting habitat: water quality - contaminants	Very low risk from leaks from construction and maintenance machinery (4).	Additional risk from maintenance machinery used at the Norfolk Projects area.
Supporting habitat: water quality - dissolved oxygen	Very low risk as a result of suspended solid pollution arising from construction activity affecting saline lagoons within the PCS (4). Additional risk arising from bird faeces should a gull colony become established within the PCS.	Additional risk should a gull colony establish in the Norfolk Projects area.
Supporting habitat: water quality - nutrients	As for dissolved oxygen.	As for dissolved oxygen.
Supporting habitat: water quality - turbidity	As for dissolved oxygen.	As for dissolved oxygen.

Table 4-19: Risk of Adverse Effects on the Attributes for Ruff (non-breeding)

Attribute	For the Project 'Alone'	For the Project 'In Combination'
Non-breeding population: abundance	Very low risk; the very low risks set out below for the attributes are unlikely to affect the non-breeding population of Ruff.	Elevated risk when considered with other activity at Orford Ness, but still low.
Connectivity with supporting habitats	No risk; the Project would not affect the passage of birds moving between roosting and feeding areas.	-
Disturbance caused by human activity	Very Low risk; Ruff is very unlikely to make use of the saline lagoons in and around the PCS and any disturbance is unlikely to result in significant disturbance.	Elevated risk when considered with other activity at Orford Ness, but still low.
Pathogens	Low risk, the Project is unlikely to result in the introduction and spread of pathogens, including Highly Pathogenic Avian Influenza, however it is possible that it would be spread by workers at the PCS.	Additional risk from maintenance at the Norfolk Projects area.
Supporting habitat: air quality	No risk; the Project will have no appreciable risk for air quality.	-
Supporting habitat: conservation measures	No risk; the Project will not hinder the ability to undertake habitat management within the SPA.	-
Supporting habitat: extent, distribution and availability of supporting habitat for the non-breeding season	No risk; the Project will not affect the extent, distribution and availability of supporting habitat for the non-breeding season.	-
Supporting habitat: food availability (bird)	Very low risk which is derived from the risk to water quality from construction activity (4) and bird faeces should a gull colony become established (7).	Additional risk should a gull colony establish in the Norfolk Projects area.
Supporting habitat: hydrology/flow	No risk, the Project will not affect the hydrology of freshwater marsh.	-

Attribute	For the Project 'Alone'	For the Project 'In Combination'
within grassland (marsh)		
Supporting habitat: landform	No risk; the Project will not affect shallow slope gradients to the length/perimeter of ditches, drains, pools and scrapes.	-
Supporting habitat: landscape	No risk; the Project will not reduce open and unobstructed terrain around roosting and feeding sites.	-
Supporting habitat: vegetation characteristics for feeding	No risk; the Project will not reduce the extent and distribution of predominantly short (<10 cm) grassland swards or arable fields in areas used for feeding, as this habitat is not present in the PCS.	-
Supporting habitat: vegetation characteristics for nesting	No risk; the Project will not reduce the optimal mix of vegetation of short (<5 cm) to medium/long (>10 cm) vegetation throughout the nesting area, as the PCS is not suitable for nesting Ruff.	-
Supporting habitat: vegetation characteristics for roosting	No risk; the Project will not affect the vegetation structure of key roost sites, dominated by bare ground or a short sparsely-vegetated sward, as the PCS is no a known roost site for Ruff.	-
Supporting habitat: water depth	No risk; as only localised effects at the ditch crossing points could occur which would not affect Ruff foraging habitat.	-
Supporting habitat: water quality - contaminants	Very low risk from leaks from construction and maintenance machinery (4).	Additional risk from maintenance machinery used at the Norfolk Projects area
Supporting habitat: water quality - dissolved oxygen	Very low risk as a result of suspended solid pollution arising from construction activity affecting saline lagoons within the PCS (4). Additional risk arising from bird faeces should	Additional risk should a gull colony establish in the Norfolk Projects area.

Attribute	For the Project 'Alone'	For the Project 'In Combination'
	a gull colony become established within the PCS (7).	
Supporting habitat: water quality - nutrients	As for dissolved oxygen.	As for dissolved oxygen.
Supporting habitat: water quality - turbidity	As for dissolved oxygen.	As for dissolved oxygen.

ORFORDNESS - SHINGLE STREET SAC (UK0014780)

4.2.31 An assessment of the potential of the Project to have an adverse impact on the Attributes and therefore undermine the conservation objectives of the Orfordness to Shingle Street SAC is presented in Table 4-20, Table 4-21 and Table 4-22.

Table 4-20: Risk of Adverse Effects on the Attributes for 1150 Coastal lagoons

Attributes	For the Project 'Alone'	For the Project 'In Combination'
Distribution: presence and spatial distribution of biological communities	Low risk related to water quality, for which see below.	No additional risk as the Norfolk Projects area does not include saline lagoons.
Extent and distribution	Low risk; the Project will not change the extent and distribution of saline lagoons unless lagoon banks are impacted (1) (see below).	No additional risk as the Norfolk Projects area does not include saline lagoons.
Extent of water	Low risk; the Project will not change the extent of water within the saline lagoons, nor affect the any changes caused by the tidal cycle. unless lagoon banks are impacted (1) (see below).	No additional risk as the Norfolk Projects area does not include saline lagoons.
Structure and function: presence and abundance of key structural and influential species	There are no key structural and influential species listed in the SACO; however, these could be the starlet sea anemone and the lagoon sand shrimp. Low risk associated with water quality if these species are present in the PCS (4, 7).	No additional risk as the Norfolk Projects area does not include saline lagoons.

Attributes	For the Project 'Alone'	For the Project 'In Combination'
Structure: isolating barrier - presence, nature and integrity	No risk; the saline lagoons within the PCS are percolation lagoons without an isolating barrier.	-
Structure: non-native species and pathogens (habitat)	Low risk associated with non-native species brought onto site on construction and maintenance equipment (5). The SACO lists New Zealand pigmyweed *Crassula helmsii*, pacific oyster *Crassostrea gigas*, slipper limpet *Crepidula fornicata* and the New Zealand mud snail *Potamopyrgus antipodarum* as possible invaders. Low risk associated with pathogens associated with bird faeces should a gull nesting colony establish within the PCS (7).	Additional risk associated maintenance of the Norfolk Projects area.
Structure: sediment composition and distribution	No risk; the project will not affect sediment composition and distribution within the lagoons.	-
Structure: species composition of component communities	Low risk related to water quality, for which see below.	Additional risk as the Norfolk Projects area also displaces grazers and may result in the establishment of a gull colony.
Structure: structure and integrity of lagoon banks	Low risk; the lagoons within the PCS lie in depressions generally without a bank however the artificial banks along the sides of the ditches within the PCS may have a function in maintaining the lagoons; these will be reinstated following fence installation however there is a residual risk of loss of function (1).	No additional risk as the Norfolk Projects area does not include saline lagoons.
Structure: water depth	Low risk, only if lagoon banks are impacted (1).	Additional risk as the Norfolk Projects area includes fences across drainage ditches.

Attributes	For the Project 'Alone'	For the Project 'In Combination'
Supporting processes: eutrophication of sediments	Low risk, associated with both the exclusion of grazing animals (6) and the establishment of a gull colony (7), potentially resulting in nutrient levels that are too high or too low. Aerial imagery indicates that one of the lagoons in the PCS may be suffering from excess nutrients and algal blooms.	Additional risk as the Norfolk Projects area also displaces grazers and may result in the establishment of a gull colony.
Supporting processes: physico-chemical properties (habitat)	No risk, the fence would not affect salinity, pH or temperature levels of the saline lagoons in the PCS.	-
Supporting processes: sediment contaminants	Very low risk from leaks from construction and maintenance machinery (4).	Additional risk from maintenance machinery used at the Norfolk Projects area
Supporting processes: water quality - contaminants (habitat)	Very low risk from leaks from construction and maintenance machinery (4).	Additional risk from maintenance machinery used at the Norfolk Projects area
Supporting processes: water quality - nutrients (habitat)	As for eutrophication.	As for eutrophication.
Supporting processes: water quality - turbidity (habitat)	Very low risk as a result of suspended solid pollution arising from construction activity affecting saline lagoons within the PCS (4). Additional risk arising from bird faeces should a gull colony become established within the PCS (7).	Additional risk should a gull colony establish in the Norfolk Projects area.

Table 4-21: Risk of Adverse Effects on the Attributes for 1210 Annual vegetation of drift lines

Attributes	For the Project 'Alone'	For the Project 'In Combination'
Distribution of the feature, including associated transitional habitats, within the site	No risk	-
Extent of the feature within the site	No risk	-
Future extent of habitat within the site and ability to respond to seasonal changes	No risk	-
Structure and function (including its typical species): key structural, influential and distinctive species	No risk	-
Structure and function: niches for seedling establishment	No risk	-
Structure and function: nutrient availability	No risk; the nutrients for this habitat are derived from the sea (tidal litter).	-
Structure and function: sediment size range and type	No risk	-
Structure and function: vegetation - undesirable species	Low risk; invasive non-native species could be imported to the site on construction and maintenance machinery (5).	Slightly elevated risk due to use of maintenance machinery in the Norfolk Projects area.

Attributes	For the Project 'Alone'	For the Project 'In Combination'
Structure and function: vegetation community composition	Low risk; arising from possible introduction of invasive non-native species (5).	Slightly elevated risk due to use of maintenance machinery in the Norfolk Projects area.
Structure and function: vegetation structure - zonation and transitions	No risk	-
Supporting processes: aeolian (wind-blown) processes	No risk	-
Supporting processes: beach morphology and structure	No risk	-
Supporting processes: conservation measures (habitat)	No risk	-
Supporting processes: functionality and sediment supply including connectivity with the wider coastal sediment system	No risk	-
Supporting processes: water quality (habitat)	No risk	-

Table 4-22: Risk of Adverse Effects on the Attributes for 1220 Perennial vegetation of stony banks.

Attributes	For the Project 'Alone'	For the Project 'In Combination'
Distribution of the feature, including associated transitional habitats, within the site	No risk; the Project will not change the distribution of the habitat.	-
Extent of the feature within the site	No risk; the project will not change the extent of the habitat.	-
Future extent of habitat within the site and ability to respond to seasonal changes	No risk, the Project will not influence the future extent or seasonable changes for this habitat.	-
Structure and function (including its typical species): key structural, influential and distinctive species	Low risk; due to changes in species composition within the PCS due access by vehicles (1) and to removal of grazers (6).	Elevated risk as the Norfolk Projects area also requires the use of vehicles and excludes grazers.
Structure and function: functionality and sediment supply including connectivity with the wider coastal sediment system	No risk; the shingle with the PCS is stable and not directly connected to the wider coastal sediment system.	-
Structure and function: nutrient availability	No risk; the Project will not change nutrient availability	-
Structure and function: sediment size range and type	No risk; the Project will not change the sediment range and type.	-
Structure and function: vegetation -	Low risk; invasive non-native species could be imported to the	Slightly elevated risk due to use of maintenance machinery in the Norfolk Projects area.

Attributes	For the Project 'Alone'	For the Project 'In Combination'
undesirable species	site on construction and maintenance machinery (5).	
Structure and function: vegetation community composition	**Medium risk within the PCS only**; arising from access by vehicles (1) the exclusion of grazers (6) and the possible introduction of invasive non-native species (5).	Slightly elevated risk due to access by vehicles, the exclusion of grazers and use of maintenance machinery in the Norfolk Projects area.
Structure and function: vegetation structure - patterns of vegetation with naturally bare ground	**Medium risk within the PCS only**; arising from access by vehicles (1) and the exclusion of grazers (6).	Slightly elevated risk due to the use of vehicles and exclusion of grazers from the Norfolk Projects area.
Structure and function: vegetation structure - zonation and transitions	**Medium risk within the PCS only**; arising from the exclusion of grazers (6).	Slightly elevated risk due to the exclusion of grazers from the Norfolk Projects area.
Supporting processes: air quality (habitat)	No risk	-
Supporting processes: conservation measures (habitat)	No risk; the Project will not affect the ability to manage the SAC.	-
Supporting processes: hydrology (habitat)	Low risk due to fence lines crossing ditches at the PCS and potential for these erode shingle habitats at the location of the fence (8)	Additional risk as the Norfolk Projects fence also crosses ditches.
Supporting processes: sedimentary processes	No risk; the Project will not affect sedimentary processes as it is within an area of stable shingle.	-
Supporting processes: shingle morphology	Low risk; no natural shingle ridges will be damaged during construction or maintenance however the Project could	Possible additional risk, depending on reinstatement of shingle at the Norfolk Projects area, and the use of vehicles.

Attributes	For the Project 'Alone'	For the Project 'In Combination'
	change the shingle morphology along the fence alignment if excavated material is not returned to its original location, and at the ditch crossing. Vehicular access also has the potential to change shingle morphology.	
Supporting processes: water quality (habitat)	No risk; this habitat is a 'dry' habitat feed by rainwater.	-

ALDE-ORE & BUTLEY ESTUARIES SAC (UK0030076)

4.2.32 As there is the lack of connections by surface water drains, the introduction of invasive non-native species is the only impact pathway arising from the Project with the potential for adverse effects on the Alde-Ore and Butley Estuaries SAC. This could have an adverse effect on the following attributes of the Qualifying features.

- Atlantic salt meadows (Glauco-Puccinellietalia maritimae): Structure and function: vegetation - undesirable species
- Estuaries: Structure: non-native species and pathogens (habitat)

4.2.33 However, these attributes relate to specific species and groups which are already present within the estuarine component of the SAC. These are:

- Common cordgrass *Spartina anglica*.
- Pacific oyster *Crassostrea gigas*.
- Slipper limpet *Crepidula fornicate*.
- Benthic ostracod *Eusarsiella zostericola*.
- Bacterial pathogens from faecal contamination including from birds

4.2.34 There is no risk that the Project would cause the further introduction or spread of these species within the SAC as these only occur in the marine environment, or increase the risk of pathogens beyond any efforts to restore bird populations within the SPA.

MINSMERE -WALBERSWICK RAMSAR UK11044

4.2.35 Effects on the implied conservation objectives for Eurasian Marsh Harrier (breeding), and Pied avocet (breeding) are assessed for the Alde-Ore Estuary SPA and Ramsar, see above.

4.2.36 Eurasian Teal is known to occur at or near the PCS in winter. The effects of this species during the winter are provided in Table 4-11. It is possible that the birds observed at Orford Ness during the winter breed at the Minsmere -Walberswick Ramsar, therefore the risks identified in Table 4-11 may apply to the breeding population of Eurasian Teal at Minsmere -Walberswick Ramsar.

4.2.37 Great Bittern (breeding) and Bearded Tit (breeding) are strongly associated with reedbeds, Gadwall (breeding) and Northern Shoveler (breeding) are strongly associated with freshwater wetlands. Any occurrence of these four species at or near the PCS, which does not contain these habitats, is likely to be of short duration and therefore any effects at the PCS would not undermine the implied conservation objectives for these species at Minsmere -Walberswick Ramsar.

MINSMERE-WALBERSWICK SPA UK9009101

4.2.38 Effects on the conservation objectives for Little Tern (breeding), and Pied Avocet (breeding) are assessed for the Alde-Ore Estuary SPA and Ramsar, and for Great Bittern (breeding), Northern Shoveler (breeding and non-breeding), Gadwall (breeding and non-breeding) and Eurasian Teal (breeding), the assessment is the same as for Minsmere -Walberswick Ramsar.

4.2.39 Eurasian Marsh Harrier (non-breeding) and Hen Harrier (non-breeding) occur at Orford Ness during the winter, and the two populations may be linked. The risk of undermining the relevant conservation objectives for these two species during the winter relate to the availability of open habitat and prey items at Orford Ness and elsewhere within their range. Only in the worst case scenario, derived from water pollution, would the Project affect the availability of prey items and therefore have the potential to undermine the conservation objectives for these two species at Minsmere-Walberswick SPA. The large hunting range of these species relative to the size of the PCS and, more specifically, the saline lagoons within it mean that such effects are extremely unlikely.

4.2.40 Effects on European nightjar (breeding), and Great White-fronted Goose (non-breeding) were screened out at Stage 1.

4.3 STEP THREE: EFFECTS ON INTEGRITY

ALDE-ORE ESTUARY RAMSAR (UK11002)

4.3.1 Following on from the assessments set out in Section 4.1 and 4.2, the risks that the unmitigated Project would undermine the implied conservation objectives for the Alde-Ore Estuary Ramsar are low. However, without mitigation, adverse effects on the integrity of the Alde-Ore Estuary Ramsar cannot be fully excluded for the following impact factors:

- Factor 1: Damage to qualifying interest habitats or the habitats of qualifying interest features, including topography, during fence installation, maintenance and removal, during the installation of a ditch crossing, and during the management of vegetation.
- Factor 2: Direct mortality of qualifying interest animals and plants during fence installation and removal, and during the installation of a ditch crossing, and during the management of vegetation.
- Factor 3: Disturbance of qualifying interest birds due to the presence of workers during fence installation, maintenance and removal and during the installation of a ditch crossing, and when undertaking vegetation management.
- Factor 4: Release of suspended solids and other pollution into waterways during fence installation, maintenance and removal, during the installation of a ditch crossing, and when undertaking vegetation management.
- Factor 5: Spread of non-native invasive species and pathogens by bringing these on to site on construction and maintenance machinery and materials and on workers clothing.

- Factor 6: Removal of gazing animals from the PCS, affecting vegetation composition.
- Factor 7: Increases in nutrients from bird faeces affecting vegetation composition and water quality.

ALDE-ORE ESTUARY SPA (UK9009112)

4.3.2 Similarly, for the Alde-Ore Estuary SPA, the risks are low but adverse effects on site integrity cannot be fully excluded without mitigation for the following impact factors:

- Factor 1: Damage to qualifying interest habitats or the habitats of qualifying interest features, including topography, during fence installation, maintenance and removal, during the installation of a ditch crossing, and during the management of vegetation.
- Factor 2: Direct mortality of qualifying interest animals and plants during fence installation and removal, and during the installation of a ditch crossing, and during the management of vegetation.
- Factor 3: Disturbance of qualifying interest birds due to the presence of workers during fence installation, maintenance and removal and during the installation of a ditch crossing, and when undertaking vegetation management.
- Factor 4: Release of suspended solids and other pollution into waterways during fence installation, maintenance and removal, during the installation of a ditch crossing, and when undertaking vegetation management.
- Factor 5: Spread of non-native invasive species and pathogens by bringing these on to site on construction and maintenance machinery and materials and on workers clothing.
- Factor 6: Removal of gazing animals from the PCS, affecting vegetation composition.
- Factor 7: Increases in nutrients from bird faeces affecting vegetation composition and water quality.

ORFORDNESS - SHINGLE STREET SAC (UK0014780)

4.3.3 For Orfordness - Shingle Street SAC risks are again low but adverse effects on site integrity cannot be fully excluded without mitigation for the following impact factors:

- Factor 1: Damage to qualifying interest habitats or the habitats of qualifying interest features, including topography, during fence installation, maintenance and removal, during the installation of a ditch crossing, and during the management of vegetation.
- Factor 4: Release of suspended solids and other pollution into waterways during fence installation, maintenance and removal, during the installation of a ditch crossing, and when undertaking vegetation management.
- Factor 5: Spread of non-native invasive species and pathogens by bringing these on to site on construction and maintenance machinery and materials and on workers clothing.
- Factor 6: Removal of gazing animals from the PCS, affecting vegetation composition.
- Factor 7: Increases in nutrients from bird faeces affecting vegetation composition and water quality.
- Factor 8: Changes in hydrology caused by fence lines across ditches.

ALDE-ORE & BUTLEY ESTUARIES SAC (UK0030076)

4.3.4 For Alde-Ore and Butley Estuaries SAC there is no risk that the project would undermine the conservation objectives and therefore adverse effects on the integrity of this SAC can be excluded without mitigation.

MINSMERE -WALBERSWICK RAMSAR (UK11044)

4.3.5 For Minsmere -Walberswick Ramsar, the following could have direct effects on the qualifying interest features, if the same birds also make use of Orford Ness for breeding or outside the breeding season:

- Factor 2: Direct mortality of qualifying interest animals and plants during fence installation and removal, and during the installation of a ditch crossing, and during the management of vegetation.
- Factor 3: Disturbance of qualifying interest birds due to the presence of workers during fence installation, maintenance and removal and during the installation of a ditch crossing, and when undertaking vegetation management.

4.3.6 The other Factors (1, 4 - 7) could also have indirect effects meaning that there is no possibility these could affect Minsmere -Walberswick Ramsar directly but could affect their qualifying interest if the same birds also make use of Orford Ness for breeding or outside the breeding season.

MINSMERE-WALBERSWICK SPA (UK9009101)

4.3.7 For Minsmere -Walberswick SPA, the following could have direct effects on the qualifying interest features, if the same birds also make use of Orford Ness for breeding or outside the breeding season:

- Factor 2: Direct mortality of qualifying interest animals and plants during fence installation and removal, and during the installation of a ditch crossing, and during the management of vegetation.
- Factor 3: Disturbance of qualifying interest birds due to the presence of workers during fence installation, maintenance and removal and during the installation of a ditch crossing, and when undertaking vegetation management.

4.3.8 The other Factors (1, 4 - 7) could also have indirect effects meaning that there is no possibility these could affect Minsmere -Walberswick SPA directly but could affect their qualifying interest if the same birds also make use of Orford Ness for breeding or outside the breeding season.

4.4 STEP FOUR: MITIGATION MEASURES

FACTOR 1: DAMAGE TO QUALIFYING INTEREST HABITATS OR THE HABITATS OF QUALIFYING INTEREST FEATURES, INCLUDING TOPOGRAPHY, DURING FENCE INSTALLATION, MAINTENANCE AND REMOVAL, DURING THE INSTALLATION OF A DITCH CROSSING, AND DURING THE MANAGEMENT OF VEGETATION

4.4.1 The ground disturbance will be the minimum necessary for the installation of fence to minimise damage to the shingle habitat. As far as possible, reinstatement will match the existing topography, preserving any banks which may influence saline lagoons. Any wooden items (posts, railway sleepers etc; invertebrate habitat) which need to be removed during the fence installation will be returned to the same or very nearby place following the works. Wooden items will be left *in situ* within the PCS following the fence installation.

4.4.2 The place for the crossing point of the ditch in the south of the PCS will be selected to avoid open shingle banks with a lichen flora. The design of the crossing would result in no permanent loss (i.e. minor and temporary disturbance at most) of shingle habitat. Either a temporary bridge will be used, or a culvert will be installed. The culvert would be covered with shingle which is locally sourced but not from within any Annex I habitat. The final details of the ditch crossing will be set out in the final LIMP and the construction method statement for approval by the Secretary of State and LPA respectively.

4.4.3 Vehicles will travel along existing access tracks as far as possible. Only if necessary, will the vehicles be driven off the existing access tracks and into the PCS. Any vehicles used off the tracks will, where required, use an appropriately agreed method, e.g. low ground pressure rubber tyres or tracks (not steel), such as softrak vehicle, which will not change the shingle morphology.

FACTOR 3: DISTURBANCE OF QUALIFYING INTEREST BIRDS DUE TO THE PRESENCE OF WORKERS DURING FENCE INSTALLATION, MAINTENANCE AND REMOVAL, DURING THE INSTALLATION OF A DITCH CROSSING, AND WHEN UNDERTAKING VEGETATION MANAGEMENT.

4.4.4 The installation and removal of the fencing, and management and maintenance, will take place outside the bird nesting period (not between April and August). The works to install and remove the fence will take less than four weeks and with a maximum of three gangs (three teams of two) working at any one time.

FACTOR 4: RELEASE OF SUSPENDED SOLIDS AND OTHER POLLUTION INTO WATERWAYS DURING FENCE INSTALLATION, MAINTENANCE AND REMOVAL, DURING THE INSTALLATION OF A DITCH CROSSING, AND WHEN UNDERTAKING VEGETATION MANAGEMENT.

4.4.5 A construction method statement (CMS) will be prepared setting out measures to prevent and reduce aquatic pollution during fence and ditch crossing installation/ removal and the LBBG Implementation and Monitoring Plan will set out similar measures to be implemented during management and maintenance works.

FACTOR 5: SPREAD OF NON-NATIVE INVASIVE SPECIES AND PATHOGENS BY BRINGING THESE ON TO SITE ON CONSTRUCTION AND MAINTENANCE MACHINERY AND MATERIALS ABD ON WORKERS CLOTHING.

4.4.6 All machinery, materials and equipment to be brought onto site will be clean and checked for the presence of INNS and mud (which could contain INNS). The fence line will be surveyed for existing invasive non-native plant species in advance of the works. Any found will be removed and appropriately disposed of. Detailed measures will be set out in the CMS and LBBG Implementation and Monitoring Plan.

4.4.7 Standard biosecurity measures will be set out in the CMS and final LIMP, with reference to any outbreaks of Highly Pathogenic Avian Influenza.

FACTOR 6: REMOVAL OF GAZING ANIMALS FROM THE PCS, AFFECTING VEGETATION COMPOSITION.

4.4.8 To create or maintain open areas, patches of Sea Couch will be cut and outside the breeding season for LBBG. These measures have a dual purpose, firstly to create open areas suitable for nesting LBBG and secondly to minimise negative changes in the vegetation from the removal of grazing. The details will be set out in the LBBG Implementation and Monitoring Plan for the PCS.

FACTOR 7: INCREASES IN NUTRIENTS FROM BIRD FAECES AFFECTING VEGETATION COMPOSITION AND WATER QUALITY

4.4.9 In the event that a gull colony is established within the PCS, and increased nutrients are noted to be affecting features within the site, consideration may be given to removing cut vegetation from the PCS and the designated site, which would therefore help reduce the potential additional nutrients arising from nesting LBBG. The balance of nutrients will be determined by the numbers of nesting birds, which is as yet unknown, however it will be no more than would occur with the restoration of the LBBG population in accordance with the site's conservation objectives. The details will be set out in the LBBG Implementation and Monitoring Plan for the PCS.

FACTOR 8: CHANGES IN WATER FLOWS BY CAUSED BY FENCE LINES ACROSS DITCHES

4.4.10 The fence line may result in change in hydrology should the fence across ditches affect the flow or water should it entrap debris. Therefore, it will be routinely inspected and cleared of debris.

4.4.11 Regular checks will be carried out at all points where the fence crosses an existing drainage channel. Any debris within the channel or trapped on the fence will be removed. Any damage to the channel or the fence will be remediated or scheduled for repair/ replacement. The checks will be carried out at any crossing points at least twice per year when other monitoring is taking place. Additional checks will be scheduled for the complete length of the fencing following a flood event on site. These checks should include for debris removal and integrity checks of the fencing.

4.5 CONCLUSION

4.5.1 With the implementation of the mitigation set out in Section 4.4, it can be ascertained, beyond reasonable doubt, that the Project would not have an adverse effect on the integrity of the following or any other European and Ramsar sites:

- Alde-Ore Estuary Ramsar (UK11002)
- Alde-Ore Estuary SPA (UK9009112)
- Orfordness - Shingle Street SAC (UK0014780)
- Alde-Ore & Butley Estuaries SAC (UK0030076)
- Minsmere-Walberswick Ramsar (UK11044)
- Minsmere-Walberswick SPA (UK9009101

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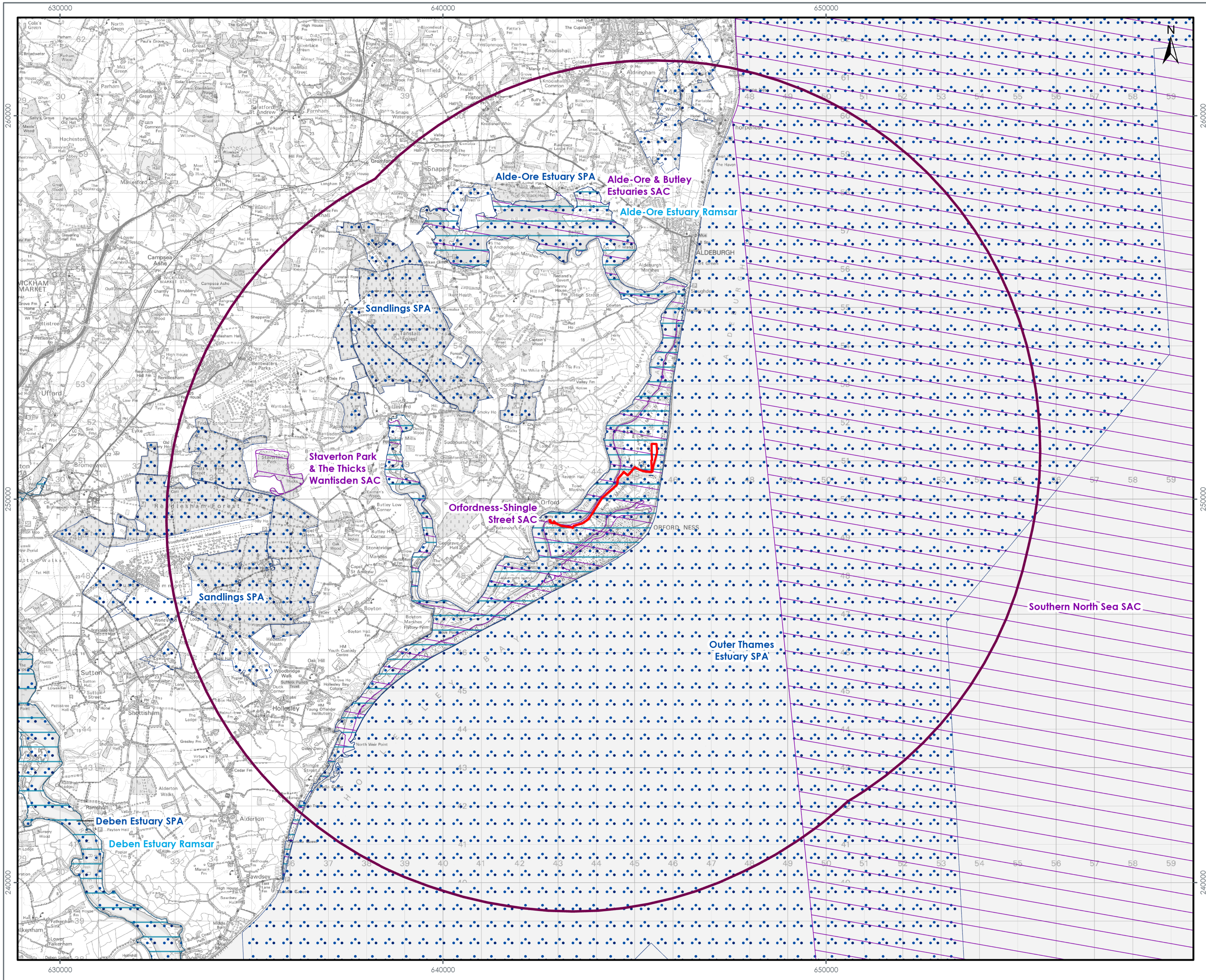
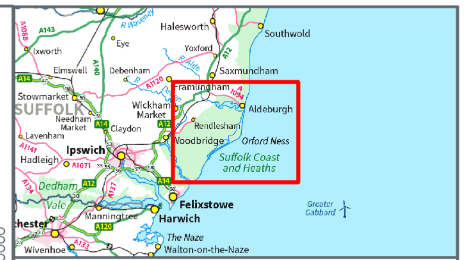




LEGEND

- Lesser Black-backed Gull (LBBG) Compensation Area
- Lesser Black-backed Gull (LBBG) Compensation Area 10 km Buffer
- Ramsar
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)

0 2 4
Kilometres

Data Source:

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

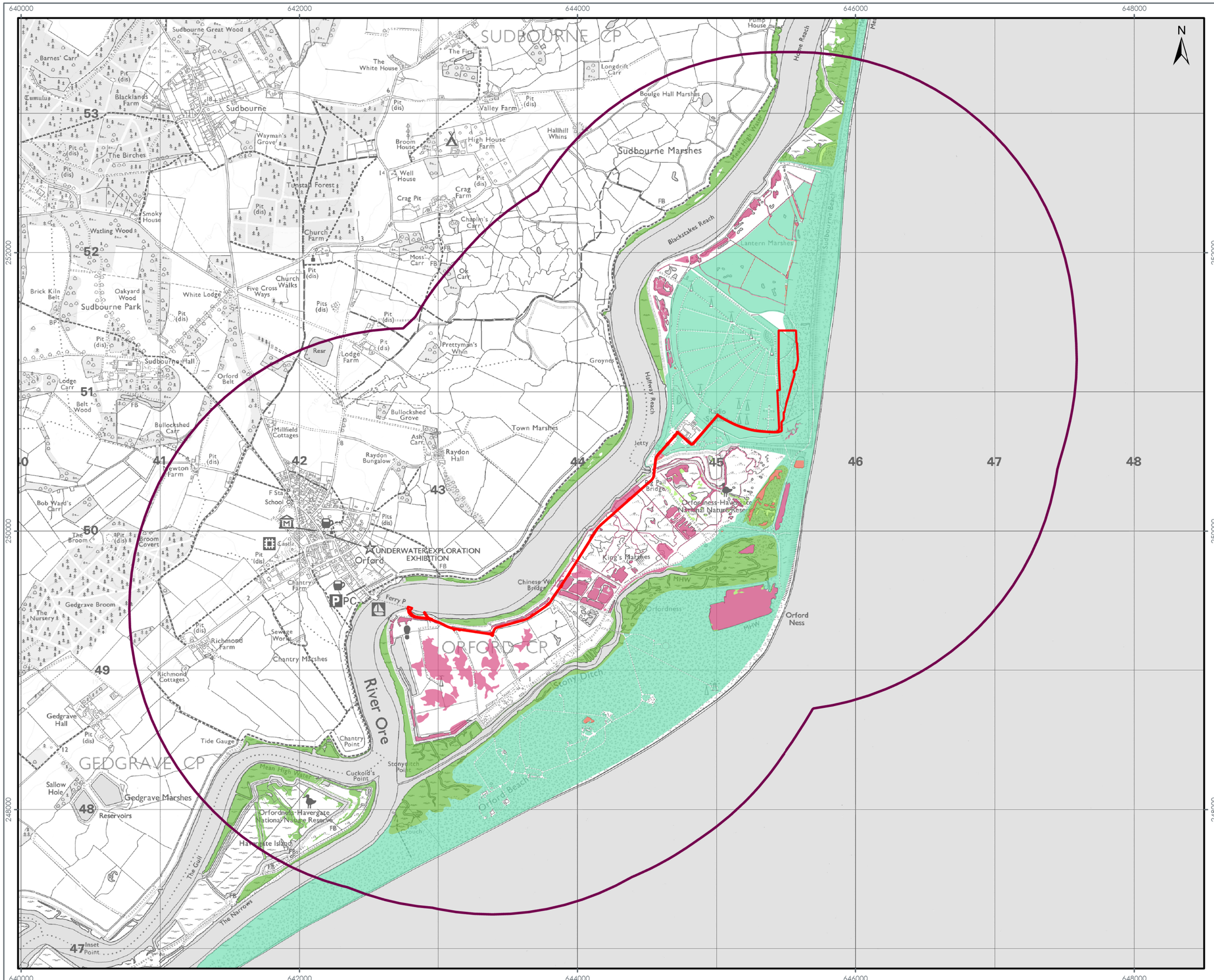
EUROPEAN AND RAMSAR SITES

VER	DATE	REMARKS	Drawn	Checked
1	21/03/2024	ES Submission	QF	JRS
2	02/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 1

SCALE: 1:90,000 | PLOT SIZE: A3 | DATUM: OSGB 1936 | PROJECTION: British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM



LEGEND

- Lesser Black-backed Gull (LBBG) Compensation Area
- Lesser Black-backed Gull (LBBG) Compensation Area 2 km Buffer

Annex I Habitats

- 1330 Atlantic Salt Meadows (Glauco-Puccinellietalia maritimae)
- 1330 Atlantic Salt Meadows (Glauco-Puccinellietalia maritimae)/ 1150 Coastal Lagoons*
- H1220 Perennial Vegetation of Stony Banks
- 1220 Perennial Vegetation of Stony Banks/ 1150 Coastal lagoons*
- H1150 Coastal Lagoons*

Note: * is a priority habitat

0 0.5 1
Kilometres

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

ANNEX I HABITATS

VER	DATE	REMARKS	Drawn	Checked
1	21/03/2024	ES Submission	QF	JRS
2	02/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 2

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:25,000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM

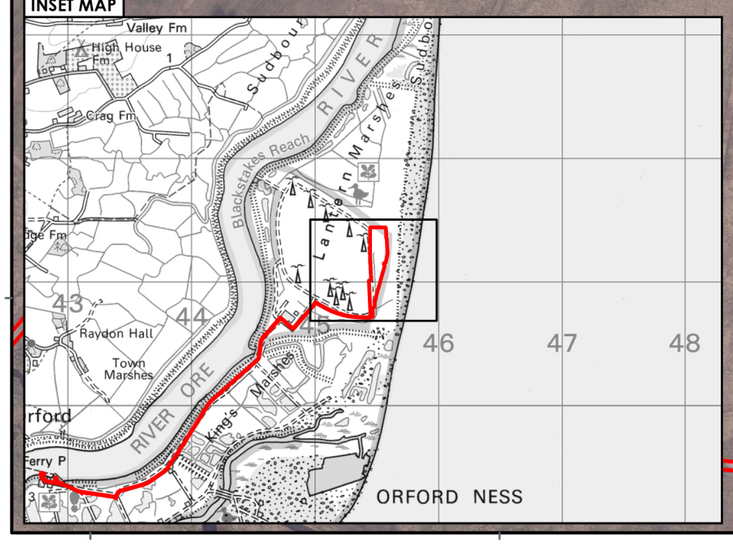
645000 645200 645400 645600 645800

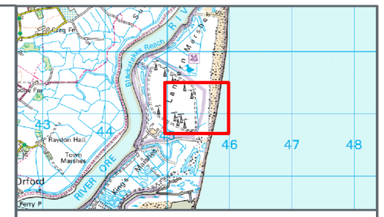
251400 251200 251000 250800

N

1150 1150 1220 1150 1150 1150 1150

INSET MAP





LEGEND

- Lesser Black-backed Gull (LBBG) Compensation Area
- Survey Area
- Proposed Fence Line

UK Habitat Classification

- Ditch

Annex 1 Habitats

- 1150 Coastal Lagoons*
- 1220 Perennial Vegetation of Stony Banks

Note
The compensation site has been revised and therefore the Survey Area and Compensation Area the now differ.

* is a priority habitat.

0 50 100
Metres

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
ANNEX I HABITATS WITHIN PROPOSED COMPENSATION SITE

VER	DATE	REMARKS	Drawn	Checked
1	21/03/2024	ES Submission	QF	JRS
2	02/10/2024	Order Limit Update	JO	JRS

DRAWING NUMBER: 3

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:3,000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM

645400
645600
645800
251200
251000
250800
N
QD11
QD12
SH71
QD13
QD14
QD15
SH78
TN8
QD16
QD21
TN9
SM8
TN7
SM8
SM8
TN6
QD2
SH71
QD3
QD10
QD17
QD20
QD9
SH78
QD18
TN5
QD19
QD8
SM8
QD7
SM8
SH78
QD22
QD6
TN4
TN3
QD23
QD5
QD4
TN2
SH78
TN1
QD24
SH71
SM16
INSET MAP
Blackstakes Reach
Lantern Marsh
44
45
46
47
ORE
Marshes
King's
Blackstakes Reach
Lantern Marsh
44
45
46
47
ORE
Marshes

LEGEND

- Lesser Black-backed Gull (LBBG) Compensation Area
- Survey Area
- Proposed Fence Line
- Target Note
- Vegetation Quadrat Location

National Vegetation Classification (NVC) Habitat

- SH71 - Arrhenatherum Elatius Dominated Grassland
- SH78 - Elytrigia Atherica Dominated Grassland
- SM8 - Annual Salicornia Salt-Marsh Community
- SM16 - Festuca Rubra Salt-Marsh Community
- Varying Shingle Habitat

0 50 100
Metres

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
VEGETATION AND INVERTEBRATE SURVEY

VER	DATE	REMARKS	Drawn	Checked
1	14/11/2024	Deadline 4	DB	JRS

DRAWING NUMBER: 4

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
1:2.000	A3	OSGB 1936	British National Grid

FIVE ESTUARIES
OFFSHORE WIND FARM

FIVE ESTUARIES
OFFSHORE WIND FARM

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