FIVE ESTUARIES
OFFSHORE WIND FARM

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ENVIRONMENTAL STATEMENT

VOLUME 9, REPORT 9.22: OUTLINE LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN – REVISION C (TRACKED)

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~~Project~~	~~Five Estuaries Offshore Wind Farm~~
~~Sub-Project or Package~~	~~Environmental Statement~~
~~Document Title~~	~~Outline Landscape and Ecological Management Plan~~
~~Document Reference~~	~~005023939-04~~
~~Revision~~	~~C~~

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 the purpose

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
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DEFINITION OF ABBREVIATIONS AND ACRONYMS

Term	Definition
CIEEM	Chartered Institute of Ecology and Environmental Management
CoCP	Code of Construction Practice
CSCS	Construction Skills Certification Scheme
CSZ	Core Sustenance Zone
DCO	Development Consent Order
DLL	District Level Licensing
ECC	Export Cable Corridor
ECOW	Ecological Clerk of Works
EPSL	European Protected Species Licence
ES	Environmental Statement
GCN	Great Crested Newt
GI	Green Infrastructure
HDD	Horizontal Directional Drilling
IACPC	Impact Assessment and Conservation Payment Certificate
LEDPP	Landscape and Ecology Design Principles Plan
LEMP	Landscape and Ecological Management Plan
LVIA	Landscape and Visual Impact Assessment
MHWS	Mean High Water Springs
NE	Natural England

Term	Definition
NERC	Natural Environment and Rural Communities
OL	Order Limits
OLEMP	Outline Landscape and Ecological Management Plan
OnSS	Onshore Substation
PEIR	Preliminary Environmental Information Report
PRoW	Public Rights of Way
TCC	Temporary Construction Compound
UKPN	UK Power Networks
VE	Five Estuaries Offshore Wind Farm

GLOSSARY OF TERMS

Term	Definition
Cable Works TCC	Temporary Construction Compounds (TCC) associated with onshore cable works.
Compensation	Compensation describes measures taken to offset residual effects resulting in the loss of, or permanent damage to, ecological features despite mitigation. For example, it may take the form of replacement habitat or improvements to existing habitats.
Construction Substation Access Zone	The area which will contain final OnSS access route during construction.
East Anglia Connection Node (EACN) Substation	The new NG substation. This will be subject to a DCO application submitted by NG.
Effect	Term used to express the consequence of an impact.
Expert Topic Group (ETG)	Key stakeholders and consultees involved in the scoping and design process.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial, resulting from the activities associated with the construction, operation and maintenance, or decommissioning of the project.
Maximum Design Scenario	The maximum design parameters of the combined project assets that result in the greatest potential for change in relation to each impact assessed.
Mitigation	Mitigation measures are commitments made by the project to reduce and/ or eliminate the potential for significant effects to arise as a result of the project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
Onshore Export Cable Corridor (onshore ECC)	The Onshore ECC is the wider cable corridor within which the preferred cable route is located. The Onshore ECC is typically approximately 90m wide, however some areas require a wider corridor (such as where trenchless crossing may take place)
Priority Habitat	Habitat listed under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006
Priority Species	Species listed under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006
Order Limits	The extent of development including all works, access routes, Temporary Construction Compounds (TCCs), visibility splays and discharge points.

Term	Definition
Study area	This is the 2 km zone around the Order Limits.
Statutory Metric	The statutory (official) biodiversity metric is a standardised way of measuring the biodiversity value of an area, in accordance with Defra tools and guidelines.
Substation zone	The area in which the final substation footprint will be located.
Survey area	Except where stated otherwise, this is the 100 m zone around the Proposed Order Limits in place at the time of survey.
Waterbirds	The definition of waterbirds follows that used by the Wetland Bird Survey (WeBS) and includes wildfowl (ducks, geese and swans), waders, rails, divers, grebes, cormorants and herons.

1 OUTLINE LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN

1.1 INTRODUCTION

1.1.1 This Outline Landscape and Ecological Management Plan (OLEMP) sets out the in-principle measures which will be implemented for the onshore elements of Five Estuaries Offshore Wind Farm (VE) to avoid, reduce, mitigate or compensate for potential impacts on landscape and biodiversity resources, and the green infrastructure network they comprise. It also includes measures intended to provide biodiversity and green infrastructure enhancements.

1.1.2 This OLEMP has been prepared by SLR Consulting and Optimised Environments (OPEN) on behalf of the Applicant, Five Estuaries Offshore Wind Farm Ltd. This is an outline document that, by reference to the assessments reported in the Environmental Statement (ES), sets out the key elements that will be included in the final Landscape and Ecology Mitigation Plan (LEMP) which will be agreed with the Local Planning Authority and other relevant stakeholders prior to any construction works commencing.

1.1.3 This OLEMP makes reference to the project description, landscape and visual impact assessment and onshore biodiversity assessment that are reported in the following chapters in Volume 6 Part 3 of the ES:

- Chapter 1: Onshore Project Description;
- Chapter 2: Landscape and Visual Impact Assessment (LVIA); and
- Chapter 4: Onshore Biodiversity and Nature Conservation.

1.1.4 Both Chapters 2 and 4 consider the potential effects of the removal of landscape elements including ground cover, hedgerows, trees and woodlands. The LVIA considers the physical effect of this removal as landscape elements that contribute to landscape character and the Onshore Biodiversity and Nature Conservation assessment considers these elements as ecological assets that contribute to the wider biodiversity of the area. Chapter 1 provides details of the onshore elements of VE which have informed Chapters 2 and 4.

1.1.5 This OLEMP includes all ecological and landscape and visual related measures that will be employed during the onshore construction and operation of VE. Measures only related to construction are also copied into the Code of Construction Practice (CoCP) at Volume 9, 9.21 Code of Construction Practice., which also includes additional ecological protection measures in respect of biosecurity and pollution prevention.

1.1.6 This latest version of the OLEMP (Revision C) has been updated to account for joint (VE and North Falls) progression of the design at the Onshore Substation (OnSS) area. A small section of farmland to the south east of North Falls proposed substation location is no longer proposed for screening planting, this area would return to agricultural use. The proposals now align to the existing boundary of the field (see Figure 1 for updated indicative OLEMP design).

In addition, following stakeholder feedback, a series of plans and supporting text has been included to provide further explanation of what is considered to be Visual Screening within the OLEMP (Figure 2), what is Landscape Enhancement within the OLEMP (

~~1.1.5~~1.1.7 Figure 3) and what is Ecological Compensation and Enhancement within the OLEMP (Figure 4).

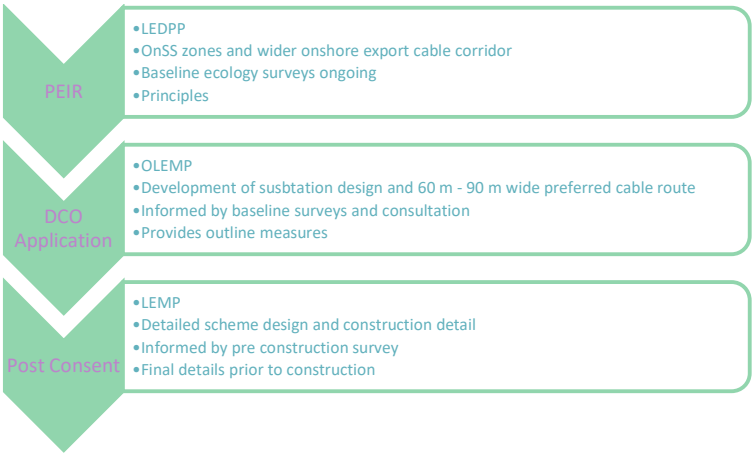
~~1.1.6~~1.1.8 This OLEMP (and subsequent Final LEMP), follow the principles that were set out in the Landscape and Ecology Design Principles Plan (LEDPP), that was part of the Preliminary Environmental Information Report (PEIR) provided to inform Statutory Consultation which ran from 15 March 2023 to 12 May 2023.

~~1.1.7~~1.1.9 At PEIR stage, the LEDPP set out the principles that have been used in the development of this OLEMP which, in turn, sets out the key landscape and ecology elements that will be secured in the Final LEMP that will be submitted to the Local Planning Authority for approval, in consultation with other relevant stakeholders, under a requirement of the DCO.

~~1.1.8~~1.1.10 Following its approval, the Final LEMP would be implemented as approved for the relevant stage of construction and operation. Where ongoing review of construction works necessitates an amendment to the Final LEMP, this would be approved by the Local Planning Authority before the amendment is implemented.

~~1.1.9~~1.1.11 Diagram 1 shows the relationship of the LEDPP, OLEMP and LEMP documents.

Diagram 1-1: LEMP Development Process



1.2 DEVELOPMENT OF LANDSCAPE AND ECOLOGICAL MITIGATION, COMPENSATION AND ENHANCEMENT AT THE ONSHORE SUBSTATION LOCATIONS

1.2.1 This section presents further detail with regard to the provision of landscape and ecological mitigation measures, illustrated on Figures 1-4, which have formed an integral part of the design of the VE OnSS (for further information see 6.3.1 Onshore Project Description [AS-004]).

1.2.2 The process of landscape and habitat design at the OnSS location started with identification of where and how best to mitigate landscape and visual impact. The rationale for the approach in this instance, is that landscape mitigation is location specific and constrained, more so than ecological compensation/enhancement ~~mitigation/ compensation~~, so it makes sense as the starting point. The reason that there is more ecological flexibility at the OnSS is that the location is of very limited ecological value (other than for farmland birds), such that there is scope to deliver ecological mitigation, compensation or enhancement in a range of ways and places at the OnSS location.

1.2.3 The provision of permanent landscape and ecological mitigation, compensation and enhancement in the same location represents a more efficient mitigation proposal that reduces the overall long-term land-take of the project.

1.2.4 In addition to mitigation and compensation for impacts associated with the OnSS, there is also a requirement to deliver ecological enhancement to meet current legislation and planning policy with respect to the project. Ecological enhancements have been located in areas where they will bring the most ecological benefit. In general, that means linking into existing habitat networks and, joining together or expanding important species populations, to create a larger, more resilient system. Enhancements will also require management and monitoring for the life of the development and this also has a bearing on location.

1.2.5 On that basis, enhancements were considered best placed at the OnSS location where they could build upon the planned landscape and ecology mitigation and ecology compensation measures. Therefore, this provides greater ecological value for the same area of land take and more robust ecosystem resilience. Accordingly, while the shelterbelts largely relate to landscape and visual mitigation, and the hedgerows and grasslands largely relate to ecological ~~mitigation~~compensation and enhancement, all components of the OLEMP serve to ~~mitigate~~address landscape, visual and ecological effects, albeit to varying degrees. This is further explained below and illustrated on Figures 1 – 4.

LANDSCAPE

1.2.6 The mitigation of visual effects combines the following key considerations, which are illustrated on Figure 2:

- Use of tree planting combined with hedgerows or understorey planting to create effective visual screens in terms of density and projected height.
- Containment of planting within shelterbelts to create effective visual screens whilst also minimising the loss of agricultural land.
- Locating planting adjacent to roads, PRoWs and properties to ensure that an outer perimeter of effective visual screening is formed in the shortest time possible.
- Creation of an inner perimeter of planting that will further add to the ~~the~~visual screening effect of the OnSS.
- Connection of existing planting and proposed planting to create a more effective framework for visual screening across the local landscape.
- Creation of an orchard on the northern side of the substations, which will provide low level visual screening whilst also meeting requirements of constraints associated with existing overhead cables in this area and the proposed 400kV underground cable to be installed as part of the Project.

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1.2.7 This has resulted in the creation of a landscape framework that will effectively screen the onshore substations from surrounding visual receptors within a 5 to 15 year period. The framework allows the field to the south-east of the onshore substations to be retained for agricultural use and that other pockets of land can accommodate Sustainable Drainage Systems (SuDS) and a variety of grasslands, scrub and other ecological habitats important for biodiversity.

1.2.8 The landscape and ecological mitigation planting also fulfils considerations around landscape enhancement, as presented in Figure 3 and outlined below:

- Respect of local landscape character by containing proposed tree planting within shelterbelts, which are an existing feature of the rural farmland.
- The proposed ~~F~~framework of planting enables green corridors across the site and connects with existing hedgerows and shelterbelts to ensure integration of character across the local landscape.
- Integration of enclosing hedgerows and shelterbelts around open fields of grassland or crops retains the baseline character of contrasting enclosure and openness.
- Orchard planting on the northern side restores a traditional feature of this rural landscape and adds contrast in a context where arable fields, grassland and hedgerows predominate.
- Planting for visual screening will reduce the effects of the substation on landscape character and enable the rural influence to prevail over time.

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1.2.9 While the construction and operation of the onshore substations will have a notable effect on local landscape character, the mitigation planting will create a landscape setting that will mature over time to gradually reduce the influence of the built development and gradually enhance the landscape character through increased enclosure of the trees and hedgerows.

1.2.10 Full detail in respect of Landscape mitigation is provided at Section 2.

ECOLOGICAL MITIGATION, COMPENSATION AND ENHANCEMENT

1.2.11 After the requirements for visual mitigation and landscape enhancement were defined, the design was iteratively updated. Working within the confines of the proposed landscape planting, the OLEMP also seeks to deliver compensation for permanent loss of habitat associated with the OnSS footprint, whilst accommodating~~e~~ surface water management requirements, avoiding constraints associated with existing overhead cables to the north and further constraints associated with proximity of planting to OnSS infrastructure. In addition the OLEMP seeks to deliver a coherent scheme that is in line with the strategy and standards set out in Essex County Council's 'Essex Green Infrastructure Strategy 2020' (2020) and 'Essex Green Infrastructure Standards 2022' (2022).

1.2.12 As illustrated in the indicative scheme in Figures 1-4, the location of the OnSS results in three relatively small, triangular shaped field parcels to the north, west and south. The southern most field parcel is required to accommodate a surface water drainage system (two permanent SuDS and two temporary SuDS needed for construction stage, but which would be retained for biodiversity benefit after construction). The field parcel to the north (currently proposed as orchard planting) is considered necessary for landscape mitigation and is also constrained by the presence of an existing overhead line. The field parcel to the west is required to compensate for the permanent loss of habitat associated with the OnSS footprint, the interiors of these parcels are also utilised for this purpose. The field parcel to the north east is considered necessary, in addition to the three triangular field parcels, to provide a required level of ~~the~~ biodiversity enhancement to meet national planning policy requirements.

1.2.13 Lastly the field parcel in the south east has not been used for ecological compensation, mitigation or enhancement, and is being returned to agricultural use. The boundary planting is present for landscape screening reasons, but the species mixture is included as a biodiversity enhancement.

1.2.14 Full details of ecological measures included in the OLEMP are provided in Sections 3-10.

FIGURES

This Section includes relevant figures to present the overall indicative scheme of the OLEMP (

Figure 1), as well as, a series of figures to provide context, delineating what is considered to be Visual Screening within the OLEMP (Figure 2), what is Landscape Enhancement within the OLEMP (

1.2.15 Figure 3) and what is Ecological Compensation and Enhancement within the OLEMP (Figure 4).

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LEGEND

- Onshore Order Limits
- Refugia for Reptiles, Amphibians and Mammals
- Nest Box for Barn Owls
- Nest Box for Kestrels
- Nest Box for Passerines
- Indicative Scattered Scrub over Neutral Grassland
- Species Rich Native Hedgerow
- Species Rich Native Hedgerow With Tree
- Approximate Line of Drainage Ditch (Mainly Dry)
- Pond
- Wetland Area (Grassland)
- Locally Native Broadleaved Woodland
- Traditional Orchard Over Species-Rich Neutral Grassland
- Species-Rich Neutral Grassland
- Dry Stony Area For Invertebrates (Neutral Grassland)
- Lowland Meadow
- Invertebrate Bank
- Agricultural Use
- Onshore Substation (OnSS, Developed Land: Sealed Surface)
- Onshore Substation (OnSS, Artificial Unvegetated, Unsealed Surface)
- Indicative Substation Access Route

PROJECT TITLE:

FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:

OUTLINE LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN: ONSS

VER	DATE	REMARKS	Drawn	Checked
1	21/02/2024	ES Submission	JO	JRS
2	22/10/2024	Deadline 2 Submission	JO	JRS

DRAWING NUMBER: 1

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
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FIVE ESTUARIES
OFFSHORE WIND FARM

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LEGEND

- Onshore Order Limits
- Species Rich Native Hedgerow
- Species Rich Native Hedgerow With Tree
- Locally Native Broadleaved Woodland
- Traditional Orchard Over Species-Rich Neutral Grassland

Note
Other mitigation and enhancements have been faded to aid interpretation.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
VISUAL MITIGATION

VER	DATE	REMARKS	Drawn	Checked
1	22/10/2024	Deadline 2 Submission	JO	JRS

DRAWING NUMBER: 2

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
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FIVE ESTUARIES
OFFSHORE WINDFARM

LEGEND

- Onshore Order Limits
- Species Rich Native Hedgerow
- Species Rich Native Hedgerow With Tree
- Pond
- Wetland Area (Grassland)
- Locally Native Broadleaved Woodland
- Traditional Orchard Over Species-Rich Neutral Grassland
- Species-Rich Neutral Grassland
- Lowland Meadow
- Agricultural Use

Note
Other mitigation and enhancements have been faded to aid interpretation.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
LANDSCAPE ENHANCEMENTS

VER	DATE	REMARKS	Drawn	Checked
1	22/10/2024	Deadline 2 Submission	JO	JRS

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FIVE ESTUARIES
OFFSHORE WIND FARM

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Ecological Compensation
Mixed species orchard. Provides shelter, roosting and nesting locations, as well pollen, nectar and fruit foraging resource for a wide range of invertebrate, bat, bird and small mammal species.

Ecological Enhancement
Lowland meadow with wetland mosaic. Beneficial for invertebrates, reptiles, amphibians, and small mammals.

Ecological Enhancement
Reinstate internal hedgerows and mature trees indicated on historical maps.

Grange Road

Ardleigh Road

Ecological Compensation
Scrubby, species-rich grassland with mixed microclimates. Provides shelter and nesting locations beneficial for invertebrates, reptiles, amphibians, and small mammals.

Ecological Compensation
Wetland and woodland pond complex. Provides shelter, roosting, nesting and foraging locations beneficial for invertebrates, reptiles, amphibians, and small mammals.

LEGEND

- Onshore Order Limits

Specific Ecological Enhancement for Particular Species / Species Groups

- Refugia for Reptiles, Amphibians and Mammals
- Nest Box for Barn Owls
- Nest Box for Kestrels
- Nest Box for Passerines
- Indicative Scattered Scrub over Neutral Grassland
- Dry Stony Area For Invertebrates (Neutral Grassland)
- Invertebrate Bank

Structurally Diverse Species-Rich Habitats

- Species Rich Native Hedgerow
- Species Rich Native Hedgerow With Tree
- Reinstated Historic Habitat Links
- Pond
- Wetland Area (Grassland)
- Locally Native Broadleaved Woodland
- Traditional Orchard Over Species-Rich Neutral Grassland
- Species-Rich Neutral Grassland
- Lowland Meadow

Note
Other mitigation and enhancements have been faded to aid interpretation.

PROJECT TITLE:
FIVE ESTUARIES OFFSHORE WINDFARM

DRAWING TITLE:
ECOLOGICAL COMPENSATION AND ENHANCEMENTS

VER	DATE	REMARKS	Drawn	Checked
1	22/10/2024	Deadline 2 Submission	JO	JRS

DRAWING NUMBER: 4

SCALE:	PLOT SIZE:	DATUM:	PROJECTION:
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FIVE ESTUARIES
OFFSHORE WIND FARM

~~1.2~~ RELATIONSHIP OF THE OLEMP WITH BIODIVERSITY NET GAIN (BNG) REQUIREMENTS AND BNG REPORTING

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~~1.2.1~~1.2.16 ~~The contents of this document relate only to the area within the onshore DCO Order Limits (OL).~~ For clarity; the driving force for the extent of land required at the ~~Onshore Substation (OnSS)~~OnSS has primarily been landscape led, with the requirement for the project to deliver ecological mitigation, compensation and enhancements (in line with current policy and legislation, irrespective of the Statutory Metric) developed within those bounds. The design of the scheme at the OnSS has not been driven by the requirement to deliver a specific number of Biodiversity Units to deliver a certain quantum of BNG as measured by the Statutory Metric. However, the design presented works hard to maximise biodiversity benefit within the limits of the landscape planting, and the Statutory Metric has been applied afterwards in order to meet consultee requests to include this element.~~The plan at Figure 1 provides outline details of habitat creation within the OL.~~

1.2.17 ~~Whilst demonstrating BNG through the use of the Statutory Metric is not mandatory for NSIPs at the time of writing, it has been included in readiness of mandatory NSIP BNG commencing in 2025. Figure 1 has been used as the basis for the BNG Indicative Design Stage Assessment at Volume 6, Part 6, Annex 4.18 of the ES. Off-site measures, if later required, fall outside the scope of this document.~~ Refer to Volume 6, Part 6, Annex 4.18 Biodiversity Net Gain Indicative Design Stage Report for further details ~~in respect to~~of the approach to biodiversity net gain.

1.3 STRUCTURE OF THIS DOCUMENT

1.3.1 This OLEMP is structured as follows:

- Section 2 sets out the landscape mitigation principles for construction and operation of the onshore elements of VE including proposals for screening planting at the ~~onshore substation (~~OnSS~~)~~ site;
- Section 3 sets out ecological scope;
- Section 4 presents proposals for the protection of Holland Haven Marshes SSSI
- Section 5 provides details of proposals for the protection of other retained habitats;
- Section 6 provides details of measures to address potential impacts on protected or notable species;
- Section 7 provides details in respect of reinstatement of habitats at the Onshore Export Cable Corridor (Onshore ECC) and Temporary Construction Compounds (TCCs);
- Section 8 sets out initial proposals for habitat creation at the OnSS;
- Section 9 outlines proposals for ecological monitoring and management; and
- Section 10 describes how the landscape and ecological measures are set out within DCO Requirements

1.3.2 This OLEMP provides the basis upon which the BNG Indicative Design Stage Assessment at Volume 6, Part 6, Annex 4.18 of the ES has been prepared.

1.4 KEY TERMINOLOGY USED IN THIS DOCUMENT

- **Pre-commencement or pre-construction**: this phrase relates to the phase for tasks that are not strictly construction related, but which are necessary to facilitate

it. This phase could include tasks such as ground investigation work, archaeological investigations or similar.

- **Construction**: this includes all tasks related to the construction of the onshore elements of VE.
- **Reinstatement:** the process at the end of the construction period whereby affected areas are reinstated to their original state, or to habitats of greater ecological value.
- **Aftercare period:** The period after reinstatement during which successful establishment of vegetation is anticipated to occur. If it does not occur within the period then remedial action is taken. For the VE project this period will be 5 years and applies to all areas.
- **Long-term management:** The period beyond aftercare, that applies only to areas within the control of the applicant and that are necessary to ensure landscape screening effect is maintained, biodiversity net gain and/ or protected species mitigation requirements are met.

2 LANDSCAPE MITIGATION

2.1 PRIMARY LANDSCAPE MITIGATION

2.1.1 Primary mitigation in respect of the onshore elements of VE has involved the sensitive siting and design of the onshore infrastructure during site selection, in order to reduce or avoid potential impacts.

2.1.2 The site selection process considered a range of environmental and technical constraints, including ensuring a good separation from settlement and rural properties, avoiding landscape elements, such as woodlands, trees and hedgerows, and considering issues such as surface water flooding (Volume 6, Part 1, Chapter 4: Site Selection and Consideration of Alternatives). The sensitivity of the surrounding landscape and of residents, road-users, workers and recreational users of the landscape was also a key consideration.

2.1.3 The capacity of the landscape to accommodate the onshore elements of VE is assessed in relation to the natural screening afforded by landform, woodlands and trees and the degree to which other surrounding infrastructure and buildings influence visual screening. As screening is limited in this landscape, especially in respect of the area around the OnSS, the approach has been to locate the onshore ~~export cable corridor (~~ECC~~)~~ and the OnSS with the maximum separation from nearby settlements and rural properties as is practically possible.

2.1.4 The UK Power Networks (UKPN) Lawford Substation is located on Ardleigh Road to the immediate south-west of the substation zone. While the substation is relatively well screened by surrounding tree cover, the overhead electricity transmission lines that converge at this location from the north, north-east, south-east and south-west provide a context of electrical infrastructure in the area immediately surrounding the substation zone. This context was considered in site selection and aligning with it is considered embedded mitigation.

2.1.5 Mitigation measures that were identified and adopted as part of the evolution of the project design (embedded into the project design) and that are relevant to the LVIA are presented below.

2.2 CONSTRUCTION PHASE MITIGATION

2.2.1 Mitigation opportunities during the construction phase of works will primarily relate to the restrictions imposed on the working areas and measures identified in the CoCP (Volume 9, Report 21: Code of Construction Practice).

2.2.2 This OLEMP sets out the principles and key landscape and ecological elements for the onshore elements of VE. The OLEMP and CoCP seek to stipulate measures to avoid, reduce or offset environmental effects of the construction works, including those related to landscape elements, landscape character and visual amenity. Since PEIR, the selection of a single option for the landfall and OnSS, and the detailed routing of a single option for the onshore ECC, has meant that more detailed mitigation measures have been developed, in particular in respect of the OnSS. Sensitive siting of construction compound areas associated with the landfall, onshore ECC and the OnSS, away from more visible and larger numbers of receptors, and the commitment to the use of trenchless techniques along substantial sections of the onshore ECC have also been important in reducing the impact on landscape elements and visual amenity.

2.3 OPERATIONAL MITIGATION

2.3.1 Once the construction phases of the onshore elements are complete, replacement planting and new planting will be implemented in association with the construction impacts of the landfall, onshore ECC and around the OnSS. Opportunities to implement planting on completion of the construction of phased elements of VE will be optimised, for example replacement planting undertaken on completion of construction works at each section of the onshore ECC.

2.3.2 Landscape mitigation measures seek to avoid, reduce or offset temporary and permanent environmental effects, including effects on landscape character and visual amenity. Landscape and visual effects will change over time as mitigation planting establishes and matures. The planting and restoration of habitat types form part of the implementation of the onshore elements of VE.

2.4 ESSEX GREEN INFRASTRUCTURE STRATEGY

2.4.1 Mitigation proposals for VE have been developed in line with the strategy and standards set out in Essex County Council's 'Essex Green Infrastructure Strategy 2020' (2020) and 'Essex Green Infrastructure Standards 2022' (2022) (hereafter referred to as 'Essex GI Strategy' and 'Essex GI Standards' respectively.

2.4.2 The Essex GI Strategy sets out the following vision;

"We will protect, develop and enhance a high quality connected green infrastructure network that extends from our city and town centres, and urban areas to the countryside and coast and which is self-sustaining and is designed for people and wildlife."

2.4.3 Section 8.5 of the Essex GI Strategy is entitled 'Energy' and it considers how the impact of energy transmission infrastructure can lead to *"the fragmentation of natural habitats, ecosystem destruction and depletion of ecosystem services".*

2.4.4 In terms of the role of GI in mitigating these impacts the following guidance is presented;

"There is an increasing pressure on those involved in the delivery of energy transmission infrastructure to mitigate some of the deleterious effects that such development has on the environment and there is a matching understanding that often quite simple actions involving the integration of some quantity of green infrastructure into these energy transmission infrastructure schemes is a potent way of helping to address the problem."

2.4.5 The mitigation proposals have been developed to ensure the effective integration of good levels of quantitative and qualitative GI to ensure a connected GI framework. The mitigation proposals also cover a number of the key objectives underpinning the Essex GI Strategy, including; *"improve existing green infrastructure so it is better functioning for people and wildlife; create more high-quality multi-functional green infrastructure, especially in areas of deficiency; and improve the connectivity of green infrastructure for people and wildlife."*

2.4.6 As the mitigation proposals are further developed post consent, the process will be informed by the nine GI Standards set out in Table 1 of the Essex GI Standards Technical Guidance (Available at: https://www.essexdesignguide.co.uk/supplementary-guidance/essex-green-infrastructure-standards) including early engagement with all relevant stakeholders, ensuring the plans maximise connectivity and enhance multi-functionality and that consideration is made around the long term management and stewardship.

2.5 LANDFALL AND ONSHORE ECC LANDSCAPE MITIGATION

2.5.1 The Landfall is located at Sandy Point on the coastline between Frinton-on-Sea in the north-east and Holland-on-Sea in the south-west. The use of Horizontal Directional Drilling (HDD) to connect the offshore ECC and the onshore ECC will avoid the use of open cut trenching and the removal and replacement of planting along the coastal edge. The temporary construction compound (TCC) for the Landfall will be located in a farm field inset from the coastal edge, where vegetation will be removed to construct the TCC and access tracks.

2.5.2 The 22km onshore ECC will connect the Landfall at Sandy Point with the OnSS on Ardleigh Road. The combination of careful siting, the use of trenchless crossing techniques and the location of the onshore ECC predominantly within areas of arable farmland will mean the removal of large areas of vegetation will be avoided. There will, however, be the removal of small-scale and localised patches of vegetation along the route, mostly comprising hedgerows, but also occasional hedge trees and other trees in those instances where these cannot be avoided.

2.5.3 The ES considers three scenarios for the construction of the onshore ECC. The maximum design scenario (MDS) is based on Scenario 1 in which the onshore ECC combines the requirements of both VE and North Falls entering construction at the same time and gives rise to a wider onshore ECC than the other two scenarios in which the onshore ECCs of VE and North Falls would be constructed independently. Under Scenario 1 the onshore ECC will be 60 m for Sections 1 to 5 and 72 m for Sections 6 and 7 with a reduction to a 30 m width where crossing of hedgerows occurs. The onshore ECC will be up to 90m where a trenchless technique is deployed.

ONSHORE ECC MITIGATION PLANTING STRATEGY

2.5.4 The landscape mitigation strategy for the onshore ECC has helped in the refinement of the route and in identifying where trenchless crossing techniques are required to avoid sensitive landscape features such as woodlands and hedgerows. The landscape and visual strategy is as follows:

- Achievement of the best environmental fit of the 60 to 72m working width cable route where practicable, particularly in relation to maintaining separation from settlement and rural properties;
- Locating trenchless techniques to reduce the loss of hedgerows, trees and woodland along the cable route;
- Reinstatement of removed sections of hedgerows, or suitable replacement hedgerows provided for displaced or severed sections of hedgerows where practical;
- Sensitive siting of construction compounds and trenchless drilling compounds such that the locations have been carefully selected taking into account landscape

and visual receptors to reduce impacts during the construction period where practicable;

- Restoration of all temporary works and construction compounds in relation to re-establishment of ground cover;
- Protection of all retained trees during the construction phase where practicable; and
- Footpaths or cycleways that are temporarily disrupted by the proposed onshore ECC or landfall will be temporarily diverted and then reinstated.

2.5.5 Following construction of the landfall and installation of the onshore cables disturbed landcover and habitats would be reinstated. The overall aim of the reinstatement would be the re-establishment of existing ground cover or returning the disturbed ground to its original agricultural use. Where possible, excavated soils will be carefully stored and reinstated as soon as possible.

2.6 ONSS LANDSCAPE MITIGATION

2.6.1 The OnSS will be located on Ardleigh Road, to the south of Lawford and in an area which comprises predominantly arable farmland in a relatively flat plateau landscape. The fields are open and exposed with only intermittent enclosure from hedgerows and tree belts, and clusters of trees typically occurring around farmsteads, properties and rural settlements.

2.6.2 The landscape context to the OnSS comprises predominantly arable farmland, in which enclosure has been eroded and fields amalgamated, such that the landscape is relatively open. While there is currently no enclosure from hedgerows or trees along Ardleigh Road, which lies to the south of the OnSS, hedgerow planting has been implemented historically, and will form a low screen as it gradually matures over 3 to 5 years. Along Grange Road, to the west of the OnSS, there is a tall hedgerow with occasional hedge trees on the western side of the road, while on the eastern side there is new hedgerow planting. As Grange Road wraps around the north-west of the Substation Works Area ~~SSA West search area,~~ the tall hedgerow continues on the northern side of the road, while on the southern side there are intermittent trees and a continuation of the new hedgerow planting. The landscape on the eastern side of the site is generally open with intermittent trees along the central part of Ardleigh Road and more substantial trees and hedgerows along the eastern part.

2.6.3 The close proximity of existing overhead electricity transmission lines around the northwest of the Substation Works Area and the location of UKPN Lawford Substation to the immediate southwest, provides a context of electrical infrastructure within this local area. This context was considered in site selection and aligning with it is considered embedded mitigation.

ONSS MITIGATION PLANTING STRATEGY

2.6.4 Outline planting mitigation principles have been developed for the OnSS, to complement the existing landscape structure. These mitigation principles include areas of proposed tree, hedgerow and grassland planting, and areas identified for ecological mitigation in the form of habitat enhancement.

2.6.5 The purpose of the mitigation planting associated with the OnSS is two-fold;

- to create an effective screen that will reduce and/ or eliminate significant effects on landscape character and visual amenity; and

- to enhance biodiversity and achieve a net gain.

~~2.6.6~~ The proposed mitigation planting for the OnSS, is shown in Volume 6, Part 7, Annex 2.2.1-16: LVIA Visualisations, and in Figure 1~~Figure 1~~ of this document. This represents the scenario in which it is assumed both the VE OnSS and North Falls OnSS will be built. This shows a framework comprising bands of planting that connect to form an effective screen as well as network of corridors for nature. The bands of planting comprise woodland belts where possible, which will include a 2m wide hedgerow along one boundary edge. Hedgerows will also be planted where restrictions over or under cables apply, subject to ~~agreement~~ alignment with North Falls Offshore Wind Farm upon final design and submission of the final LEMP.

2.6.6 The LEMP will set out an outline of the landscape specification to accompany plans of the detailed landscape and ecological planting. The landscape specification will make reference to British Standards to ensure the highest standards are achieved in terms of the design, specification, implementation and ongoing management of the soft landscaping.

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2.6.7

~~Figure 51 Outline Landscape and Ecological Management Plan: OnSS~~

~~2.6.7~~2.6.8 The bands of planting are mostly located along field boundaries or along roadsides. There are benefits to this approach in respect of both land use and screening. The OnSS is located in Grade 1 agricultural land, with soils of excellent or good quality and land which is of importance to national food security. Rather than introducing woodland blocks or belts that would occupy fields or fragment fields and make them unusable for farming, the containment of planting along the field boundaries would minimise the disruption and enable farming to continue across most of the land surrounding the OnSS. By following this approach, the field to the south-east will be kept in productive farming.

~~2.6.8~~2.6.9 The smaller triangle of land to the immediate west of the OnSS will comprise scattered scrub over neutral grassland and enclosed by belts of woodland planting and hedgerow. To the north of the VE OnSS and North Falls Offshore Wind Farm OnSS, there will be a traditional orchard over species rich neutral grassland and with a hedge and existing trees lining the roadside. The smaller stature of the orchard trees means that they can be planted over the underground cables that extend out of the northern side of the OnSS' and their relative density means they will create an effective screen.

~~2.6.9~~2.6.10 To the south of the VE OnSS there will be attenuation ponds with woodland to the south, species rich neutral grassland to the north and hedgerow wrapping around the extents of this area. To the south of North Falls OnSS, there will be a mix of woodland, hedgerow and species rich neutral grassland. The woodland shelterbelts and hedgerow edge will also extend around the retained farm field to the south-east to further bolster the screening effect.

~~2.6.10~~2.6.11 To the immediate east of North Falls OnSS, the shelterbelt planting and hedgerow edge will enclose a smaller pocket of land in which lowland meadow will be planted. The shelterbelt planting and hedgerows will connect across the site and with existing tree cover and hedgerows in the surrounding landscape to create a network of green corridors.

~~2.6.11~~2.6.12 In terms of screening, this is most effective when the planting is close to the visual receptors, such as road-users or residents, for example along roadsides and around associated rural properties, as it will create a screen in a shorter time period than if planted further away. Furthermore, the framework establishes layers of planting at different ranges between the OnSS and the surrounding visual receptors and the cumulative effect is a more substantial screen in which gaps in one layer are typically filled by another layer at a different range.

~~2.6.12~~2.6.13 The landscape framework has been made possible by combining bands of planting along field boundaries and roadsides within the Order Limits around the OnSS (on-site planting). The extents of the mitigation planting shown around the OnSS is notably broader than would typically occur around such a development and this has enabled an especially effective screen that will help to mitigate landscape and visual effects within 5 to 15 years of the 40-year operational life of VE.

~~2.6.13~~2.6.14 Photomontages illustrating the effect of the mitigation planting in respect of the representative viewpoints are shown in the set of visualisations in Volume 6, Part 7, Annex 2.2: LVIA Visualisations, Figures 2.16 to 2.26. These show the mitigation planting following 15 years of growth, with the calculation of growth rates discussed further below.

PROPOSED PLANTING

~~2.6.14~~2.6.15 The proposed mitigation planting for the OnSS comprises of native woodland, hedgerow and grassland species. The key aims of the proposed mitigation planting will be as follows:

- To create screening from key visual receptors in the surrounding area such as rural farmsteads and properties, rural roads and Public Rights of Way (PRoWs);
- To improve the appearance of the OnSS by reducing the perceived scale and mass of the OnSS and presenting a natural and organic screen and/ or backdrop that will contrast with the built form;
- Increasing the biodiversity potential of the heavily modified agricultural landscape prevalent in these areas; and
- Exploring opportunities to connect with existing hedgerows and woodland areas to contribute to an improved integrated green network for wildlife.

~~2.6.15~~2.6.16 Essex County Council have set out guidance on the appropriate selection of tree species in their 'Essex Tree Palette: A guide to choosing the most appropriate tree species for Essex sites according to landscape character and soil type' (January 2018). 'London Clay' is the relevant category in respect of the OnSS which is located in this area. Recommended tree species include field maple *Acer campestre*, hazel *Corylus avellana*, hornbeam *Carpinus betulis*, hawthorn *Crataegus monogyna*, wild cherry *Prunus avium*, blackthorn *Prunus spinosa* and common oak *Quercus robur*.

~~2.6.16~~2.6.17 The mitigation woodland planting would comprise a mix of faster growing 'nurse' species and slower growing 'core' species. Nurse species, such as field maple, hornbeam, hazel and wild cherry, would grow quicker so that after 15-years they would be approximately 6.8 m to 8.3 m in height. They would provide shelter to bring on core species, such as oak, elder, lime and willow. Whilst the nurse species would be sufficiently fast growing to provide substantial screening of the OnSS after 15-years, the core species would outlive the nurse species and provide a preferred native woodland with a more robust structure closer in character to other woodland copses in this area.

~~2.6.17~~2.6.18 The growth rate of 6.8 to 8.3 m over 15 years represents a conservative estimate and is based on guidance set out in David Skinner's 'A Woody Plant Selection Guide' 1987) in respect of common native species. The calculations are based on a base height for whips at 0.8 m and then average predicted growth rates of between 0.4 and 0.5 m per year for the following 15 years. While growth rates may be slower than this over the first 3 to 5 years as the plants get established, typically growth will accelerate in the years that follow.

~~2.6.18~~2.6.19 Proposed woodland planting could be spaced to maximise growth rate and ultimate screening potential. An example of this would be to plant approximately one plant per 1.5m^2 in natural groups and not too regimented, for example in randomly spaced species groups of three, five and seven plants. The precise detail of these spacings should form part of the planting schedule at a more detailed stage.

~~2.6.19~~2.6.20 Hedgerow planting would comprise species rich hedgerows using appropriate native species such as hawthorn, dogwood and holly. The proposed hedgerows and woodland planting could restore historic field boundaries and strengthen lines of existing field and woodland boundaries, connecting new planting to established hedgerows and tree cover in the area and thereby complimenting the existing landscape structure. Hedgerow planting would typically involve six hedging plants set out in a staggered row over each linear metre. It is assumed that hedgerows would be managed to maintain a height of approximately 1.5 m but could be grown taller to 2.5 m or more.

~~2.6.20~~2.6.21 The mitigation planting plan also includes areas of native meadows enclosed by hedgerows and trees, which will comprise a range of grasses and wildflowers and provide a different type of habitat for a broader range of species. These areas will also incorporate species that attract pollinators, in relation to the B-Lines Project which extends to the south of the A120.

~~2.6.21~~2.6.22 The quality of the topsoil on the site has not been tested. The Land Information System classifies most of Tendring District as Soilscape 8. The general description is '*slightly acid loamy and clayey soils with impeded drainage'* and while the drainage is naturally wet the fertility is moderate to high. The extensive drainage system across this landscape helps moderate issues of flooding and the majority of the land is used for productive arable farming with only limited extents of semi-natural grassland and woodland occurring.

~~2.6.22~~2.6.23 Given the existing and historical agricultural use of this area, it is considered likely to be of relatively good quality, although potential for both flooding and drought will be taken into consideration of increasing risks associated with climate change and species selected accordingly. In relation to preparation of the planting areas the following guidelines could be followed: ensure area is weed free prior to planting; and break existing ground identified for tree planting to a suitable depth, harrow and remove large stones.

~~2.6.23~~2.6.24 A standard 5-year maintenance period will be applied. The detail of replacing failed planting will be presented in the final LEMP.

ADVANCED PLANTING

~~2.6.24~~2.6.25 In situations where it would be practical to undertake advanced planting and in locations where there would not be any interference with access or construction works, mitigation planting could be implemented during the early phases of the OnSS construction. Where implemented, advanced planting could potentially give the woodland in these areas an additional 1 to 3 years of growth prior to completion of construction and commencement of operation. This will contribute to the height of the planting and reduce the period which it will take the planting to create an effective screen, especially where planted adjacent to roadsides and settlement.

~~2.6.25~~2.6.26 In order to ensure a worst case scenario is assessed in the LVIA, advanced planting has not been considered despite there being potential for this to be achieved, especially in respect of the off-site planting and peripheral areas around the OnSS where onsite planting is proposed.

~~2.6.26~~2.6.27 Following decommissioning of the OnSS, it is expected the footprint and platform areas would be reinstated to agricultural land use with hedgerows reinstated in locations where removal might be required to enable decommissioning.

3 SCOPE OF THIS DOCUMENT RELATING TO ECOLOGY

3.1 SPATIAL SCOPE

3.1.1 This OLEMP relates to the onshore elements of VE with the OL. Except where stated otherwise this applies to the areas within the project OL that lie above Mean High Water Springs (MHWS). Details of ecological mitigation measures relating to the offshore elements of VE, including intertidal and subtidal environments, are provided in the relevant chapters of the ES (e.g. Volume 6, Part 2, Chapter 5 Benthic and Intertidal Ecology). The onshore OL is shown in the Figures within the ES, Volume 3 Chapter 1 Onshore Project Description, which also shows the locations of various different areas within the OL, as referred to in this document.

3.1.2 The main exception to the above relates to measures to avoid disturbance to birds using intertidal habitats, which are also included in this OLEMP. This mirrors the approach taken in the ES where potential impacts on birds using intertidal habitats are addressed in Volume 6, Part 3 Chapter 4: Onshore Biodiversity and Nature Conservation whilst potential impacts on intertidal habitats and faunal communities (other than birds) are addressed in the Offshore ES Volume 6, Part 2, Chapter 5 Benthic and Intertidal Ecology.

3.1.3 Within the onshore environment, mitigation, compensation and enhancement measures, as defined in the ES and Section 3.1 above, will be restricted to the area within the OL as far as is possible. Further details of how on-site mitigation, compensation and enhancement measures will be secured are provided in Section 1111 of this document.

3.2 TEMPORAL SCOPE

3.2.1 This OLEMP primarily relates to measures to be employed during the pre-commencement and construction phases of the onshore elements of VE, and restoration aftercare period (detailed at Sections 44 to 1010 of this document) i.e. until such time as reinstatement measures are deemed to be successful.

3.2.2 It also covers longer term management of habitat at the OnSS, for which full details will be included in the Final LEMP. Where relevant, measures to be employed during preventative (planned) maintenance throughout the operational phase are also included within this OLEMP. Measures which relate to the operational phase are highlighted in Section 10.210.2 of this document. A programme will be provided in the Final LEMP, once further details of all the relevant measures have been developed and agreed post consent.

3.2.3 The extent or nature of any unplanned corrective maintenance required during the operational phase cannot be fully predicted at this stage as it is by its nature unplanned, and therefore mitigation requirements cannot be fully determined. Mitigation measures relating to any unplanned corrective maintenance during the operational phase are therefore not included within this document. If required, mitigation for unplanned corrective maintenance would be subject to agreement as part of the process of updating and agreeing the Final LEMP.

3.2.4 No decision has been made regarding the final decommissioning for the onshore components of VE. It is anticipated that a separate LEMP would be produced to cover the decommissioning phase as part of the proposed decommissioning plan. Therefore, the decommissioning phase is not covered in this document. Decommissioning measures would be based on updated ecological survey data and would adhere to relevant legislation and good practice guidelines in place at the time.

3.3 TECHNICAL SCOPE (ECOLOGY)

3.3.1 This OLEMP provides summary details of mitigation and compensation measures incorporated into the onshore elements of VE to address potential impacts on landscape and biodiversity resources. Potential impacts on these resources are considered in the ES Volume 6, Part 3 Chapters 2 Landscape and Visual Impact Assessment and Chapter 4, Onshore Biodiversity and Nature Conservation.

3.3.2 The measures covered by this OLEMP for ecology include:

- Pre-commencement survey requirements;
- Protection of Holland Haven Marshes SSSI;
- Proposals for the protection of retained habitats;
- Proposals for measures to address potential impacts on protected or notable species;
- Proposals for reinstatement following construction; and
- Proposal for biodiversity mitigation, compensation and enhancements at the OnSS.

3.3.3 Details of proposed measures to manage potential impacts due to accidental pollution, both airborne (including dust) and waterborne, are provided in the CoCP and are not repeated here. The CoCP also includes details of biosecurity measures to be employed to prevent the spread of invasive non-native species and disease, which are also not repeated here.

3.3.4 This OLEMP includes initial proposals for biodiversity enhancements, in accordance with relevant planning policy. These proposals will be developed further in consultation with relevant stakeholders and details provided within the Final LEMP.

3.3.5 The OLEMP also includes proposals for monitoring and review (i.e., the Final LEMP will be subject to review at regular intervals), where required. Relevant, appropriately timed monitoring is important to enable the success of the measures set out in the LEMP to be determined and to identify the need for measures to be altered, if required.

3.4 ECOLOGICAL CLERK OF WORKS (ECOW)

3.4.1 An Ecological Clerk of Works (ECOW) shall be employed for the duration of project construction (including pre-commencement/ enabling works as required) to ensure species specific mitigation, method statements and plans are implemented effectively. Ecological measures within the final LEMP which are required for pre-commencement or construction will be undertaken under the guidance of the ECOW. Supervision of post-construction monitoring and management is covered in section 10.2~~10.2~~.

3.4.2 The ECOW will undertake the following tasks:

- Arrange all specialist ecological surveys;
- Undertake regular site inspections and pre-clearance checks (as distinct from pre-commencement/ pre-construction surveys) for legally protected or notable species;
- Monitoring compliance with the LEMP and any protected species licence(s) during construction;
- Assist in delivering site inductions and toolbox talks (i.e., presentations and the dissemination of information to site personnel on ecological matters); and
- Notifying the Applicant and/ or Principal Contractor of any issues/ breaches of the measures detailed in the LEMP.

3.4.3 All site workers will be informed of the role and contact details of the ECOW. A copy of the LEMP will be kept on site at all times and site workers will be made aware of its location and/ or who to contact in order to obtain a copy of the LEMP.

3.4.4 Given the large scale of the project it is anticipated that an ECOW team may be required, with the lead ECOW delegating duties to an appropriately skilled and experienced deputy/ assistant ECOW(s), where necessary. The lead ECOW would be expected to have a minimum of three years' experience as a professional ecologist including suitable ECOW experience, preferably on large linear infrastructure projects with knowledge of UK ecological policy and legislation. The lead ECOW would be a member or an appropriate professional body, in the case of the Chartered Institute of Ecology and Environmental Management (CIEEM) this would be Associate grade (ACIEEM) or above. They would also hold a Construction Skills Certification Scheme (CSCS) card (or equivalent). Deputy/ assistant ECOWs would also be expected to possess a suitable qualification and/or relevant professional experience.

3.4.5 Curriculum vitae for the lead ECOW and other members of the ECOW team would be provided to the Local Planning Authority to demonstrate adherence to the role description, prior to construction commencing, thereby ensuring that proposed ECOW team members are suitably qualified and experienced.

3.4.6 The ECOW/ ECOW Team will be appointed either by the Principal Contractor or by the Applicant to oversee preliminary works and construction works. It is also possible that separate ECOW/ ECOW Teams will be appointed by the Principal Contractor and the Applicant, with each ECOW/ ECOW team performing different roles.

3.4.7 Roles, responsibilities and lines of communication would be determined at the detailed design stage, with details provided in the final CoCP and final LEMP.

4 PROTECTION OF HOLLAND HAVEN MARSHES SSSI

4.1.1 Direct effects on the SSSI will be avoided through the use of HDD or other trenchless technique. The landfall compound will be located within an agricultural field supporting modified grassland that also constitutes the Section 41 (S41) (of the Natural Environment and Rural Communities (NERC) Act 2006) priority habitat coastal and floodplain grazing marsh, located immediately adjacent to, but outside of the SSSI. The following measures are proposed to protect the SSSI and its notified features:

- Pre-commencement/ pre-construction surveys for SSSI notified features including hog's fennel *Peucedanum officinale* (the foodplant of Fisher's estuarine moth), S41 and/ or red data book species that may be affected and whose distribution could have changed since the baseline surveys were undertaken to update the baseline and determine potential impacts at the time of construction. Micro-siting of project elements will be used to avoid important ecological features, where possible.
- Minimum of 10m buffer of undisturbed habitat retained between the construction footprint and the SSSI.
- Protective fencing will be installed around retained habitats of importance located directly adjacent to working areas.

4.1.2 The pre-clearance check for the presence of hog's fennel shall be undertaken during June – September during the season prior to work commencing. If a plant(s) is located and cannot be retained in situ, then options for translocation and/ or propagation will be explored. It is anticipated that any such exercise would be informed by/ in collaboration with conservation work already ongoing, involving NE, Tendring District Council, Colchester Zoo, Essex Wildlife Trust, and Writtle College. The risk of damage or disturbance to Fisher's estuarine moth food plants, and/ or individuals outside of the designated site is considered to be very low, and the success of mitigation (if required) is considered highly likely based on reported conservation efforts to date (for example online at the Action for the Wild website and Colchester Zoo (2022).

4.1.3 Measures to protect breeding birds associated with the SSSI include:

- Removal of potential nesting bird habitat will take place outside of the breeding season (March – August inclusive), where possible, to avoid damage to, or destruction of active nests. Where this is not possible, a check for the presence of nesting birds by the ECOW will take place in advance of work. Where active nests are located the relevant areas of vegetation would be retained until such time as young fledge or the relevant nesting attempt has ended.
- Surveys for Schedule 1 bird species and other breeding species of conservation concern which are likely to be particularly sensitive to disturbance, e.g., breeding waders, will take place prior to and during construction (as required). Avoidance of disturbance to these species whilst nesting will be achieved through the implementation of disturbance-free buffer zones around active nests. The extent of any buffer zones will be species and location-specific and will be determined by the ECOW, taking into consideration relevant guidance and experience from other sites, as appropriate. The ECOW will also monitor nesting attempts to check that the agreed buffer zones are successful.

4.1.4 Measures to reduce disturbance to non-breeding birds at the landfall, including species associated with the SSSI, are also proposed and comprise:

- Piling (if required at the landfall) would either take place outside the winter period (October to March) or would utilize less noisy, vibro-piling technology.
- Fencing/ hoarding would be used during the winter months to provide visual and acoustic screening of the landfall compound. Where practical, similar measures would also be employed in other areas where disturbance to significant numbers of non-breeding waterbirds associated with the SSSI is likely. The requirement for such measures would be determined by the ECOW, considering the nature and timing of the works and relevant bird data, including previous survey data and observations made during the construction period. Full details of proposed fencing type and approach would be provided in the final LEMP, post consent but prior to construction commencing, once detailed construction designs and programmes are available.
- If necessary, works at the landfall would be suspended during periods of very cold weather. Disturbance to non-breeding waterbirds is likely to be most critical during periods of prolonged cold weather, when they may be unable to feed in their usual foraging areas and may face reduced prospects for survival. A scheme has been in place since 1983 to minimise the level of disturbance from wildfowl shooting in frozen conditions (JNCC, 2019). Similar measures would be imposed here, with the works suspended after seven consecutive days on which the ground was frozen (as measured at a nearby weather station). Any suspension of works would last for a minimum of seven days thereafter and any lifting of the suspension will take into consideration the need for a period of recovery for waterbirds after the end of the severe weather itself. Any cold weather suspension of works, if required, would only apply at the landfall as non-breeding waterbirds are likely to move to the coast during such conditions (as the inland fields would be frozen).

4.1.5 Lighting for construction will be minimised to the lowest safe level, and designed such that there will be no significant increase in illumination levels at the SSSI above current levels via use of cowls and compliance with the relevant guidance (BCT, 2023). As a result there will therefore be no significant effect on SSSI invertebrate populations.

4.1.6 All habitats will be reinstated as soon as possible after construction – refer to Section 88.

5 PROTECTION OF RETAINED HABITATS

5.1.1 Working areas will be enclosed within temporary fencing (e.g. Heras fencing) to avoid inadvertent damage to adjacent habitats. All retained trees will be protected by Root Protection Areas (RPAs) within the OL during construction. The final micro-siting and maintenance of fencing locations shall be as instructed by the ECOW.

5.1.2 An Arboricultural Feasibility report has been prepared and is submitted as Volume 9, Report 22.1 Arboricultural Report as per of the ES. It presents the findings of the high-level arboricultural survey and arboricultural constraints associated with the proposed onshore elements of the Five Estuaries Offshore Wind Farm (VE OWF). It will be used to develop the proposed scheme in a manner which avoids high and moderate quality trees (category A and B respectively) as far as possible.

5.1.3 Following more detailed design development, pre-commencement/ pre-construction full survey will be undertaken by an appropriately experienced arboriculturist, and the guidance set out in BS5837:2012 Trees in Relation to Construction will be adhered to where applicable. For trees which cannot be avoided, the survey will define specific mitigation measures required for trees situated in or immediately adjacent to the working width, including where practical, measures such as the erection of protective fencing in order to minimise the impacts on trees and their roots. These will be specified it the final LEMP, once final scheme design is known.

5.1.4 The location and type of all protective fencing will be specified in the Final LEMP.

6 CREATION OF ARABLE MARGINS DURING CONSTRUCTION

6.1.1 Construction may result in temporary loss of arable margin habitat, which by its nature is transitory in character. For this reason it is considered appropriate for creation and maintenance of an equivalent area of arable margin habitat to be provided during the construction period. This will be via changes to existing cropping regime/ management and/ or sowing of appropriate seed mixture.

6.1.2 The location(s) and type of management or seed mixtures will be specified in the final LEMP, but may include cultivation followed by natural colonisation by annuals, sowing of tussocky grasses, sowing of wildflowers or a pollen and nectar mix and/ or sowing of game bird mix strips and corners (wild bird cover crops),

6.1.3 Once construction is complete, these areas will be reinstated as described at Section 88.

7 MEASURES TO ADDRESS POTENTIAL IMPACTS ON PROTECTED AND NOTABLE SPECIES

7.1 BACKGROUND

7.1.1 This section provides outline details of measures to minimise and compensate for potential impacts on protected and notable species and ensure compliance with relevant wildlife-related legislation, e.g. the Wildlife and Countryside Act 1981 and the Conservation of Habitats and Species Regulations 2017.

7.1.2 Protected and notable species which could potentially be affected by the onshore elements of VE are set out in the ES, Volume 6, Part 3 Chapter 4: Onshore Biodiversity and Nature Conservation and measures for those species are included here. Based on current information mitigation and compensation measures are not required for any other species or species groups.

7.2 PRE-COMMENCEMENT/ PRE-CONSTRUCTION SURVEYS

7.2.1 Due to the time that will have elapsed since the last surveys and the possibility that species presence or activity could have changed in the intervening period; pre-commencement/ pre-construction surveys will be undertaken for a number of species/ species groups. These include certain species which, based on current information, will not be affected by the proposed development (and are therefore not subject to the mitigation and compensation measures set out in this document) but which could potentially (re)colonise the area within the OL prior to construction commencing.

7.2.2 The aspects of this OLEMP that will be adhered to in carrying out 'pre-commencement' survey activities (where relevant to those activities), are as follows:

- Appointment of an ECOW (as set out in Section 3.43.4);
- Measures to protect Holland Haven Marshes (as set out in Section 44)
- Measures to protect other retained habitats (as set out in Section 55);
- Measures to address potential impacts on protected and notable species (as set out in Section 77); and
- Monitoring during construction (as outlined in Section 10 10).

7.2.3 The results of the pre-commencement/ pre-construction surveys will be used to identify whether any changes to the mitigation measures are required and the Final LEMP will be updated to reflect the survey results, as required.

7.2.4 Table 7-1~~Table 7-1~~ provides further details of the surveys proposed, including details of proposed survey areas (focusing on the areas likely to be affected by the works), timings and methodologies. All surveys will be undertaken by suitably experienced/ licensed ecologists who are members of an appropriate professional body, e.g. CIEEM.

Table 7-1 Pre-commencement/ pre-construction surveys

Species/Group	Survey Area	Survey Timing	Survey Methods
Notable plant species: hog's fennel, S41 and/ or red data book plant species associated with coastal habitats and arable margins	Landfall area, and arable margins that would be directly affected.	For hog's fennel, June – September the season prior to work commencing. All other species April – August the season prior to work commencing.	Walkover survey by experienced botanist familiar with these habitat types.
Great crested newt (GCN) *Triturus cristatus*	Data for ponds within 250m of the OL will be gathered. Survey extent TBC depending on availability of current, pre-existing data.	April 15th – June 30th (eDNA survey) and mid-March to mid-June for population surveys, during the season prior to construction commencing.	eDNA survey to be carried out in accordance with standard methods (Biggs *et al*., 2014). Population survey (if required) undertaken in accordance with English Nature (2001).
Dormouse *Muscardinus avellanarius*	All hedgerows likely to be directly affected within the OL and which are potentially suitable for use by dormice.	April – November during the season prior to construction commencing.	Following standard methods (Bright *et al*., 2006).
Bats	All trees within the OL and which are likely to be affected.	April to September during the season prior to construction commencing.	In accordance with good practice, currently Collins, J (ed) (2023).
Breeding Birds (species included on Schedule 1 of the Wildlife & Countryside Act 1981, and other breeding species of conservation	Suitable habitats within 100 m of the OL.	March to July during the season prior to construction commencing.	Survey to follow standard methods, as specified by Gilbert *et al*. (1998) and Shawyer (2011).

Species/Group	Survey Area	Survey Timing	Survey Methods
concern which are likely to be particularly sensitive to disturbance, e.g., breeding waders)			
Badger *Meles meles*	All terrestrial habitats within 50 m of the OL.	3-6 months prior to construction commencing.	In accordance with good practice, e.g. Scottish Natural Heritage (SNH) (2003).
Water vole *Arvicola amphibius*	All water courses which may be directly affected within or immediately adjacent to the OL (200 m upstream/ downstream of OL).	April to September during the season prior to construction commencing.	In accordance with Dean *et al.* (2016).
Otter *Lutra lutra*	All water courses which may be directly affected within or immediately adjacent to the OL (250 m upstream/ downstream of OL).	3-6 months prior to construction commencing.	In accordance with Chanin (2003).

7.3 NOTABLE PLANT SPECIES

7.3.1 As set out in Table 7-1~~Table 7-1~~, pre-commencement/ pre-construction botanical survey will be undertaken during the summer prior to work commencing to determine the presence of notable or protected plant species in areas that would be affected by construction. The results will be used to identify areas which should be prioritised for salvage or other special measures, the details of which would be included in the Final LEMP.

7.3.2 The exact mitigation/ compensation method would be dependent on the species and habitat concerned but may include seed saving and propagation or translocation of individual plants.

7.4 GREAT CRESTED NEWTS (GCN)

7.4.1 GCN populations within the OL may be impacted via:

- Temporary loss of terrestrial habitats – there are six GCN breeding ponds (also potentially used by common toad and other amphibians) within 250m of the OL;
- Temporary habitat fragmentation/ isolation, resulting in functional loss of terrestrial habitat and breeding ponds;
- Accidental killing and injury; and
- Accidental pollution to breeding ponds from diffuse or point sources associated with construction.

7.4.2 Embedded mitigation for impacts to GCN is via project siting and design. The embedded measures which are pertinent to GCN include retention of all ponds, with trees and hedgerows retained wherever practicable. Additional key principles that will be followed in order to mitigate for impacts are described below.

EUROPEAN PROTECTED SPECIES LICENCE (EPSL) REQUIREMENTS

7.4.3 Re-assessment of EPSL requirements will be undertaken based upon pre-commencement survey results and final scheme design.

7.4.4 The assessment presented in the ES (Volume 6, Part 3 Chapter 4: Onshore Biodiversity and Nature Conservation) is based upon a reasonable worst case scenario using current survey data and indicative scheme design. Using the Natural England Rapid Risk Assessment tool (part of the NE GCN EPSL Method Statement template) it has been concluded that an EPSL may be necessary in view of temporary impacts to terrestrial habitat along the ECC, and that the District Level Licensing (DLL) approach would be appropriate. VE has applied for and it is anticipated that NE will issue an Impact Assessment and Conservation Payment Certificate (IACPC), which sets out that this approach is acceptable in principle (this is pending at the time of writing, and will be included at ES Volume 6, Part 6, Annex 4.20 GCN District Level Licencing Impact Assessment and Conservation Payment Certificate and associated documents).

7.4.5 However, it is anticipated that actual impacts to GCN populations will be reduced as a result of the final scheme design having a smaller footprint than that assessed in the ES as reasonable worst case. Once the pre-commencement surveys are completed and the final scheme design known, the Natural England Rapid Risk Assessment tool will again be applied to help determine the requirement for an EPSL. If it remains the case that an EPSL is needed, then an updated IACPC would be applied for and implemented or a standard EPSL may be sought, depending upon specific impacts, and availability of the DLL scheme at that point.

MITIGATION MEASURES

7.4.6 Full mitigation details can only be determined at a later date, once pre-commencement/ pre-construction surveys are complete and final scheme design is known. Mitigation details would be included in the final LEMP and are likely to include the following measures:

- All work with potential to affect GCN will be overseen by a suitably experienced ECOW.
- The ECOW will provide a toolbox talk to site workers in advance of work with potential to affect GCN. This will detail the potential presence of GCN, their identification and what to do if one is seen.
- Mitigation will involve the management of vegetation (e.g. strimming long grass) to discourage occupation by amphibians and the identification and removal of potential refugia and hibernacula (if present) prior to construction works taking place in the relevant areas. These works will be undertaken under the supervision of the ECOW. Removal of places of shelter would only be undertaken during active periods of the GCN life cycle (considered to be March – November).
- Removal of GCN (under EPSL) and other amphibians from areas where there is risk of injury or death would be undertaken in advance of work. Translocated GCN would be moved to the nearest suitable habitat that would remain undisturbed during construction;
- Where required, temporary mitigation for temporary loss of significant GCN foraging areas along the onshore ECC will be provided where practical within the OL as close as possible to the area lost or will be mitigated via the DLL route.

7.5 REPTILES

7.5.1 Reasonable avoidance measures will be employed to reduce the chances of inadvertently killing or injuring individual reptiles during construction works in potentially suitable reptile habitat. Most potentially suitable habitat has been avoided through sensitive design, but it remains possible that reptiles may be encountered at other areas within the OL including rough grass, field boundaries, scrub and hedgerows, and as identified by the ECOW.

7.5.2 Mitigation will be as for GCN, described above.

7.6 BREEDING BIRDS

7.6.1 Removal of potential nesting bird habitat will take place outside of the breeding season (March – August inclusive), where possible, to avoid damage to, or destruction of active nests. Where this is not possible, a check for the presence of nesting birds by the ECOW will take place in advance of work. Where active nests are located the relevant areas of vegetation would be retained until such time as young fledge or the relevant nesting attempt has ended.

7.6.2 Surveys for Schedule 1 bird species and other breeding species of conservation concern which are likely to be particularly sensitive to disturbance, e.g., breeding waders, will take place prior to and during construction (as set out in Table 7-1~~Table 7-1~~). Avoidance of disturbance to these species whilst nesting will be achieved through the implementation of disturbance-free buffer zones around active nests. The extent of any buffer zones will be species and location-specific and will be determined by the ECOW, taking into consideration relevant guidance and experience from other sites, as appropriate. The ECOW will also monitor nesting attempts to check that the agreed buffer zones are successful.

7.7 NON-BREEDING WATERBIRDS

7.7.1 Measures to reduce disturbance to non-breeding birds at the landfall were outlined in Section 4~~4~~ (in relation to Holland Haven Marshes SSSI). The following measures would be implemented elsewhere along the onshore ECC and at the OnSS.

7.7.2 Where practical, in areas where disturbance to significant numbers of non-breeding waterbirds is likely, measures such as fencing/ hoarding would be used during the winter months to provide visual and acoustic screening of active working areas. The requirement for such measures would be determined by the ECOW, considering the nature and timing of the works and relevant bird data, including previous survey data and observations made during the construction period.

7.7.3 Based on current survey data such measures are most likely to be required in Route Section 3, where the route passes closest to Hamford Water, and may include screening of waterbodies used by relatively large numbers of waterbirds, where screening isn't provided by existing vegetation or topography. Full details of proposed fencing would be provided in the final LEMP, post consent but prior to construction commencing, once detailed construction designs and programmes are available.

7.8 BATS

7.8.1 Four species of bat are confirmed to roost within or directly adjacent to the OL:

- Common pipistrelle *Pipistrellus pipistrellus*;
- Soprano pipistrelle *Pipistrellus pygmaeus*;
- Natterer's bat *Myotis nattereri*; and
- Noctule *Nyctalus noctula*.

7.8.2 These, plus a further two species – brown long-eared bat *Plecotus auritus* and barbastelle *Barbastella barbarstellus* – also roost within close proximity, such that the Core Sustenance Zone (CSZ) for the colonies includes parts of the OL.

7.8.3 In addition to the above, at least five further bat species have been recorded within the OL and are considered therefore to roost within a relatively short distance; some of these species are also known to roost in trees and therefore there is a possibility of a roost being present within the OL in future.

7.8.4 Embedded measures which are pertinent to bats include use of HDD beneath all woodlands (rather than trenching through the woodland), and retention of all trees and hedgerows wherever practicable. The over-riding principle is for no net loss of potential roost resource as a result of the scheme. Mitigation also includes ensuring construction lighting at HDD locations is at the lowest, safest permissible level and with light spill minimised.

7.8.5 The construction phase may however result in the loss of a number of mature trees, including some which have moderate or high potential to support bats. None have been found to support roosting bats to date, but since tree roosting bats utilise a range of locations over any given season, an EPSL may later prove necessary pending the findings of the pre-commencement surveys.

7.8.6 The construction phase will also result in some temporary hedgerow removal, which may affect bat foraging routes.

7.8.7 Key principles that will be followed in order to mitigate and compensate for impacts are described below.

EPSL REQUIREMENTS

7.8.8 Based on current survey data and scheme design, an EPSL is not required. However, re-assessment of EPSL requirements will be undertaken based upon pre-commencement survey results and final scheme design. If required, an EPSL application would be submitted to NE in advance of work affecting bat roosts.

MITIGATION AND COMPENSATION MEASURES

7.8.9 Compensation roost features will be provided for every potential roost feature (as identified by the pre-commencement/ pre-construction surveys) affected prior to loss. This compensation measure applies regardless of whether a confirmed roost is affected. The compensation roost features will aim to provide a functionally equivalent potential roost resource and may include re-use of cavity containing sections, re-use of whole felled trunks by setting vertically as monoliths, veteranisation (cutting and carving into healthy trees to mimic nature, to speed the process of decay and rot holes) and/ or bat boxes on retained trees or installed poles, as appropriate.

7.8.10 Compensation features will be installed as close as possible to those lost, whilst also addressing other constraints, such as the requirement to be within an unlit area, ideally away from Public Rights of Way (PROW) and within or close to potential flight lines. In all cases the compensation measures for confirmed roost loss would be within the Core Sustenance Zone of the species concerned.

7.8.11 Subject to the timing of pre-commencement/ pre-construction survey, re-scoping (pre-felling check) will be undertaken at the point of felling. Due to natural decay processes and weather damage, historic data will not be used as a basis for final decision making in respect of felling: all trees will be re-scoped (ground-level assessment only) by a suitably experienced ECOW prior to felling. Thereafter the following measures will be taken:

- Potential Roost Feature (PRF) absent – trees may be felled without additional measures.
- PRF present – trees subject to an aerial inspection by a suitably qualified and licensed batworker immediately prior to felling.
  - If no evidence of bats is recorded and bat absence can be conclusively determined at all PRF, then the PRF may be immediately blocked or removed and/or tree can be immediately felled without additional special measures. In this instance PRF filling/ removal and/ or tree felling may be conducted during all months of the year.

- If it is not possible to conclude bat absence (such as with long or complex PRF which preclude full endoscope inspection, or if parts of the tree are inaccessible due to fragility) relevant trees plus the surrounding 10m vegetation (minimum, to be advised by the ECOW) will be left in situ until the bat active season (April – October). Prior to felling, these trees will be subject to a single emergence and re-entry survey (i.e. back-to-back), and assuming no bats are recorded, an update aerial inspection by a suitably qualified licensed batworker. If no evidence of bats is recorded during the process, the parts of the tree containing PRFs will then be soft and/ or sectionally felled within 24 hours of the preceding emergence survey, under the direction of the ECOW. Felled cavity-containing sections will be left undisturbed on site for any undiscovered bats to depart.
- Confirmed Roost – in all cases disturbance to or felling of roost trees will take place during the period that bats are most likely to be absent or least sensitive to impacts (i.e. in autumn/ winter in the case of maternity roosts), and under an EPSL. All work under the EPSL which could result in disturbance of bats would be overseen by the Named Ecologist, or his/ her Accredited Agent (such as a suitably skilled and experienced ECOW).

7.8.12 Impacts to commuting and foraging bats will be reduced by:

- Filling temporary hedgerow gaps overnight during construction (and thereafter) with a "dead hedge" during the bat active season (April to October) until such time as reinstated vegetation has established and is at least 1 m tall. These locations shall be identified in the Final LEMP and will be based upon pre-commencement/ pre-construction survey data plus final scheme design details. The dead hedge will be in place at least one hour before dusk and will be removed no earlier than 30 mins after dawn (unless EPSL requirements specify otherwise or a temporary exemption has been pre-agreed with the ECOW in view of ongoing construction work that finishes late/ starts early). During the day the dead hedge will be either left in-situ (if the hedgerow gap is not needed for access/ construction) or carefully placed in a nearby location that is not within the active working area. The location would be agreed with the ECOW and is anticipated to be different for each hedgerow.
- During construction the "dead hedge" will comprise Heras fencing (or similar, to enable sections to be maneuvered into/ out of position) with brash attached to a height of at least 1.2m. During construction the ECOW will regularly monitor each section of dead hedge and additional brash will be added to each section of Heras fencing if considered needed.
- Post construction, the "dead hedge" will comprise brash to a height of at least 1.2m, held in place with untreated wooden stakes, and will be allowed to degrade naturally. These would be subject to regular monitoring until the reinstated hedgerow(s) are at least 1m tall. Maintenance and repairs would be undertaken, as required.
- Figure 1~~Figure 1~~ shows, in principle, how woodland and hedgerow planting will be undertaken at the OnSS to satisfy both landscape and ecological objectives. In addition, it identifies areas where habitats are enhanced from arable uses to more diverse grassland and orchard. These changes will result in an increase in connected high quality foraging areas since they are of benefit to invertebrates with consequential benefits for other animal species, including bats.

7.9 BADGERS

7.9.1 Badger is confirmed to occur throughout the OL, with subsidiary and outlier setts both recorded. However, agricultural fields were found not to support any setts.

7.9.2 Based on current information, the construction phase will not directly impact any setts, however potential impacts shall be reviewed following completion of the pre-commencement/ pre-construction surveys. Checks for the presence of badger setts (and other protected or notable species) will also be carried out by the ECOW prior to vegetation clearance.

7.9.3 Reasonable avoidance measures shall be implemented and may include micrositing certain elements and/ or installing protective fencing to minimize disturbance to retained setts, ensuring excavations remain closed overnight or contain ramps such that badgers cannot become trapped and ensuring stockpiled soil is fenced or regularly disturbed so as to deter badger sett creation within it.

7.9.4 If pre-commencement/ pre-construction surveys determine that a badger sett will be affected, then a licence from NE will be needed in advance of work that disturbs the sett. Depending on the degree of disturbance, mitigation may be relatively limited such as amending work schedules, or more complex in the event a sett requires closure, in which case creation of artificial replacement sett in advance may be needed (depending on the type and usage of the original). Any such measures would be discussed and agreed with NE in advance and would form part of the licence Method Statement.

7.10 OTTER

7.10.1 Field survey found no evidence of otter at any locations within the survey area. Based on the lack of evidence, otter is considered likely to be absent from the majority of suitable habitats within the OL. Due to the wide-ranging nature of this species, it remains possible, but is considered unlikely that watercourses or ponds could be used occasionally or in future for passage, foraging or shelter by otters.

7.10.2 Reasonable avoidance measures would be used to reduce the risk of committing an offence under the protecting legislation. These would be broadly similar to those described for badger (above).

7.10.3 Based on current information, the construction phase will not directly impact any otter holts or resting places, however potential impacts shall be reviewed following completion of the pre-commencement/ pre-construction surveys and pre-clearance checks by the ECOW. An EPSL may be necessary from NE if a holt may be impacted.

7.10.4 If pre-commencement/ pre-construction surveys or ECOW pre-clearance checks conclude the species is present and that micrositing to avoid impact is not possible, then mitigation for temporary habitat loss and disturbance may include:

- scheduling of work to avoid sensitive periods of the otter life cycle;
- deterrence of otter from areas where there is risk of injury or death in advance, such as by installation of otter-proof fencing;
- minimising disturbance from light and human presence via temporary screening and potentially amending working hours; and
- reinstatement of bankside habitats immediately after work, to include sowing with species rich locally appropriate sward and fencing to prevent stock access.

7.11 WATER VOLES

7.11.1 Up to a medium density (Dean *et al*., 2016) of water vole was confirmed present at the northern-most section of the Holland Brook. A low population of water vole was recorded at the Tendring Brook. Since no confirmatory field signs were recorded at the other water courses within the OL, it is considered unlikely that populations were present at the time of survey. However, since water vole is a highly mobile species, it is possible that water courses linked to those with water vole records could be used seasonally or could be used in future.

LICENSING REQUIREMENTS

7.11.2 The construction phase affects two water courses which support water vole; a 10m wide haul road is proposed to cross the Tendring Brook (utilising an existing access that may require upgrading) and the Holland Brook north of Horsley Cross. Based upon current survey data a licence is not considered necessary to enable this work to proceed. However, this will be re-assessed based upon pre-commencement/ pre-construction survey results and final scheme design.

MITIGATION AND COMPENSATION MEASURES

7.11.3 If pre-commencement/ pre-construction surveys or ECOW pre-clearance checks conclude the species is present and there is potential for the detailed design to significantly affect water vole habitat, then mitigation for temporary habitat loss and disturbance may include:

- Micro-siting to avoid water vole burrows (if present).
- Scheduling of work to avoid sensitive periods of the water vole life cycle.
- Removing vegetation back to bare earth in spring and autumn.
- Carrying out a destructive search of water vole burrows, after an appropriate monitoring period, after removing vegetation.
- Creation of temporary compensation/ mitigation habitats for use by water vole in immediately adjacent areas (such as provision of nest boxes or feeding stations, sympathetic management of bankside habitats) for the construction plus vegetation re-establishment period.
- Reinstatement of bankside habitats immediately after work, to include sowing with species-rich locally appropriate sward and fencing to prevent stock access.

7.11.4 The above measures would be accommodated within the OL.

7.12 DORMOUSE

7.12.1 Breeding populations are present at several locations within the OL south of the A120. Embedded measures which are pertinent include use of HDD beneath all woodlands (rather than trenching through the woodland), and retention of trees and hedgerows wherever practicable. One hedge (reference 5EHE_38) with dormouse presence confirmed (one old nest on one occasion, at the southern end of the hedgerow) may be affected on the ECC. The option of trenchless crossing and an off-route haul road has been retained at this location, such that if dormouse are present in future impacts to the species can be avoided, and there would be no requirement for an EPSL. However, there is potential for the project to directly impact dormouse at two locations where haul routes are required through hedgerows at the B1035.

EPSL REQUIREMENTS

7.12.2 Two 10m wide hedgerow breaches to enable haul route access from the B1035 Thorpe Road to the onshore ECC are proposed. Current field survey data does not include records for dormouse in the hedges, but the species is present directly adjacent and so its potential future presence cannot be ruled out. The requirement for an EPSL will be re-assessed based upon pre-commencement/ pre-construction survey results and final scheme design.

7.12.3 In the event an EPSL is required, the EPSL application would be submitted to NE in advance of work. The conditions of the EPSL would be specified to ensure that construction and temporary presence of the haul road does not result in significant adverse impacts to the local population.

MITIGATION AND COMPENSATION MEASURES

7.12.4 If pre-commencement/ pre-construction surveys or ECOW pre-clearance checks conclude the species is present and there is potential for the detailed design to affect dormouse, then mitigation for temporary habitat loss and disturbance may include:

- creation of temporary compensation/ mitigation habitats for use by dormice in immediately adjacent areas. This may include installation of dormouse boxes and cessation of field-side hedgerow management for the construction plus hedgerow re-establishment period (roadside hedgerow management practice to remain as currently, for road safety purposes).
- Scheduling of certain work to avoid sensitive periods of the dormouse life cycle; standard practice would be followed i.e., a two-stage removal. Top growth of the hedgerow would be removed in the winter months (November – February) when dormouse are hibernating, avoiding ground disturbance. Clearance of stumps, roots and other vegetation would be undertaken from May – September thereafter.
- Deterrence from areas where there is risk of injury or death in advance.
- Reinstatement of hedgerow habitats immediately after construction.

7.13 OTHER MAMMALS

7.13.1 Checks for the presence of hedgehogs, hares, harvest mice or other protected or notable species will be carried out by the ECOW prior to vegetation clearance. Additional reasonable avoidance measures will be implemented/ mitigation licences applied for as necessary. Reasonable avoidance measures that may be employed if these species are present would be as follows:

HEDGEHOG

7.13.2 Towards the end of the autumn period (typically in November but dependent on temperature), any suitable habitat for hedgehogs to use for hibernating, such as tree roots, hedgerows, old mammal burrows, under timber buildings or compost heaps will be removed, where possible, thus minimising the risk of any hedgehogs hibernating within the development site (British Hedgehog Preservation Society 2009 Hibernation. From Know Your Hedgehog Series). If an area of potentially suitable habitat could not be removed ahead of when hedgehogs would be expected to commence hibernating, then the areas of remaining habitat would be carefully inspected by the ECOW before they are removed. Any hedgehogs found would be relocated, with any nesting material, to a hedgehog box within the nearest suitable undisturbed habitat.

BROWN HARE

7.13.3 Areas of suitable habitat with vegetation greater than 200mm in height would be subject to a two-stage cut of vegetation which would remove any suitable habitat for brown hare and lead to them leaving the area.

HARVEST MOUSE

7.13.4 As for breeding birds, in areas of potentially suitable habitat for harvest mouse vegetation will be removed outside of the harvest mouse breeding season where possible. If this is not possible, a suitably experienced ecologist will undertake a search of vegetation/ the area to be removed immediately prior to clearance, so that any harvest mouse nest sites can be identified, and their clearance delayed until any young have vacated the nest.

8 REINSTATEMENT AT THE ONSHORE ECC AND TCCS

8.1.1 The Onshore ECC and TCCs largely affect habitats of low conservation value, i.e. agricultural grassland and cropland. These will be reinstated to their previous use following construction.

8.1.2 The Onshore ECC passes through hedgerows and may affect trees with potential to support bat species that could also be lost during construction. The number of trees which need to be removed will be kept to a minimum and, where possible, trees will be avoided where temporary access is required. Following construction, removed trees will be replaced in situ with heavy standards, at a 3:1 ratio for any lost, except for those above cables which cannot be replaced in situ for operational reasons (i.e. because access to the cables is required).

8.1.3 Compensation for loss of hedgerows will be provided by re-instating native, species-rich hedgerows with trees, and including ditches where these were also present originally. Hedges will be reinstated at their original location and comprise a locally appropriate mixture of at least seven woody species and including heavy standard trees at a 3:1 ratio for any lost (noting that trees will not be planted above the installed cables).

8.1.4 Compensation for the loss of trees along the route will also be provided by the proposed screen planting at the OnSS (see Section 2 and Section 8 of this document).

8.1.5 Reinstated habitats will be subject to an aftercare period of up to five years following reinstatement, to be extended (if required) if reinstatement is not deemed to have been successful. The methods of aftercare will be agreed in the Final LEMP and subject to the results of monitoring but are likely to include the management of undesirable weeds. During the aftercare period certain areas (such as adjacent to PROW) are likely to need protection from disturbance by people, dogs and grazing animals. The precise methods for protection will be agreed as part of the Final LEMP but is likely to involve the use of temporary fencing and signage.

8.1.6 Reinstatement and aftercare would be the responsibility of VE or its appointed contractors and would only be undertaken by suitably experienced contractors. Following the aftercare period, it is envisaged that ongoing management would revert to the existing management regimes and would be the responsibility of the existing landowner/ manager.

8.1.7 Following the aftercare period, it is intended that public access will be maintained in line with existing access arrangements and that all existing footpaths will continue to be used. Management of access during construction is beyond the scope of this OLEMP and is provided within the outline CoCP at ES Volume 9, 9.21 Code of Construction Practice.

9 OUTLINE HABITAT CREATION AT THE ONSS

9.1.1 The OnSS footprint, plus adjacent construction TCCs and accesses, affects agricultural land of low intrinsic ecological value, plus a small amount of boundary hedgerow along Grange Road which is of greater interest.

9.1.2 Compensation for loss of hedgerows at the OnSS will be provided by re-instating native, species-rich hedgerows with trees, and including ditches where these were also present originally, as well as creating new hedgerows if/ where this is not possible. Hedges will be reinstated at their original location (or as close as possible), new hedgerows will be located so as to re-establish links and maintain the network. In all cases the hedgerows will comprise a locally appropriate mixture of at least seven woody species and unless directly adjacent to woodland, will also include heavy standard trees at a 3:1 ratio for any lost (noting that trees will not be planted above cable routes). Trees over and above the 3:1 replacement ratio would be considered to be an ecological enhancement.

9.1.3 In addition, S41 priority habitats lowland meadow, traditional orchard, ponds and broadleaved woodland will be created, as well as species rich neutral grassland. The aim is to provide a structurally diverse mixture of habitat types, sheltered wildflower meadows, orchards and glades, including dry stony and ephemerally wet areas suitable for sustaining a range of locally present plant and animal species.

9.1.4 The indicative landscape mitigation plan included at Figure 1~~Figure 1~~indicates how this may be achieved (and has been used as the basis for the BNG Indicative Design Stage Assessment at Volume 6, Part 6, Annex 4.18 of the ES); it is important to note that the figure is illustrative at this stage, i.e. the extent and location of habitats, mitigation and compensation measures may change at the detailed design stage.

9.1.5 Lowland meadow creation would be initiated via careful soil management, to ensure the replaced soil is of low fertility and prepared to a good standard. In this instance due to the likely high nutrient status of the soils, it is proposed to invert the topsoil and subsoil prior to reseeding. At certain locations a thin depth (<5cm) of topsoil may be appropriate to ensure slightly earlier colonisation. The seed mixture used would be a native, locally appropriate mixture, ideally gathered as green hay crop from a nearby species rich meadow or sourced from a reputable supplier.

9.1.6 Areas of species rich neutral grassland are also proposed, to account for the fact that the agricultural soils may prove difficult to return to the low nutrient status required by lowland meadow, but also to enable establishment of a variety of sward types and management regimes that will widen the range of species that the area can support. On the south sides of the substations the grassland is proposed to be stony and dry, primarily for the benefit of invertebrate species and basking reptiles. West of the substations it is proposed to be tussocky with scrub, for the benefit of birds, small mammals, reptiles and amphibians.

9.1.7 North of the proposed substations, fruit and nut orchard trees will be planted in the neutral grassland. The species selection, spacing and management will be as for the S41 habitat traditional orchard, utilising local heritage varieties where possible (such as those identified by the East of England Apples and Orchard Project[1] or by other locally based orchard groups).

[1] https://www.applesandorchards.org.uk/about/the-east-of-england-fruit-collection/

9.1.8 Woodland creation is necessary to meet landscape screening requirements (see Section 2 of this OLEMP) and will mainly comprise locally appropriate broadleaved species. It will serve to link and/ or fortify the existing habitat network thereby also assisting toward maintenance and enhancement of the green infrastructure network, Woodland boundaries will in some locations comprise hedgerow species and be maintained as such, for the benefit of a wider range of species than would be supported by woodland alone, in addition to added screening benefit.

9.1.9 At least two ponds may be required as part of the site drainage scheme, with a further two (required for construction drainage) being retained in addition to this, and wetland areas/ temporary pools also created. All pond creation is considered to be ecological enhancement, since no ponds are directly impacted by the scheme. The ponds at the OnSS will be designed so as to be of high ecological value, with varying depths, scalloped margins and areas with a wide draw down zone. They will be potentially suitable for use by a wide range of species including invertebrates, amphibians, reptiles, mammals and birds. Planting up of ponds with locally appropriate species is not initially proposed, as wetland habitats typically vegetate naturally within a relatively short period of time; this also represents the most biosecure method, minimizing the risk of importing non-native species or disease.

9.1.10 It is also proposed to install a range of bird boxes (including boxes for barn owl *Tyto alba* and kestrel *Falco tinnunculus*, as well as boxes for small passerine species) on retained trees, earth banks for invertebrates, refugia for reptiles, amphibians and small mammals.

9.1.11 Reinstated, created and/ or retained habitats will be subject to an initial aftercare period of up to five years following reinstatement/ creation, to be extended (if required) if establishment is not deemed to have been successful. The methods of aftercare during the establishment period will be agreed in the Final LEMP and subject to the results of monitoring but are likely to include the management of undesirable weeds. Longer term ecological monitoring and management is dealt with separately in Section 9 of this document.

9.1.12 Reinstatement and landscape planting aftercare would be the responsibility of the applicant or its appointed contractors and would only be undertaken by suitably experienced contractors.

10 ECOLOGICAL MONITORING AND MANAGEMENT

10.1 DURING CONSTRUCTION

10.1.1 The purpose of the ECOW is to provide ecological advice and monitor compliance. The ECOW shall ensure that biodiversity is protected and impacts either avoided or minimised as described in the Final LEMP and any EPSLs (if required). The ECOW role will be retained throughout the construction period (and any subsequent reinstatement works).

10.2 DURING OPERATION

ALL AREAS

10.2.1 In all cases monitoring shall be against defined aims and objectives which shall be included in the Final LEMP.

10.2.2 In the first instance, it is anticipated that aftercare monitoring to ensure establishment of reinstated habitats and other mitigation/ compensation/ enhancement habitats will be undertaken in years 1-5 (to coincide with the aftercare and implementation period). Further monitoring and management away from the OnSS would only be required if reinstated habitats failed to establish and would be subject to approval of the final LEMP.

ONSS

10.2.3 All habitats created as part of ecological compensation or enhancement, will be subject to long term monitoring and management to ensure that aims and objectives are met. This will be for a minimum period of 30 years, which also meets the requirements of the Statutory Metric, and at a frequency to be included in the final LEMP. A detailed post construction monitoring and management plan will be prepared, the full details will be included in the Final LEMP.

ADDITIONAL MONITORING (IF REQUIRED)

10.2.4 In the event that offsite mitigation/ compensation measures are required for the purpose of BNG or additional measures are required for protected species, these shall be monitored against defined aims and objectives which shall be included in the Final LEMP.

11 LANDSCAPE AND ECOLOGY MITIGATION MEASURES IN THE APPLICATION FOR DEVELOPMENT CONSENT

11.1.1 As noted in Section 1.1.2, it is proposed that the Final LEMP will be submitted to the Local Planning Authority for approval, following consultation with relevant stakeholders, as a requirement of the DCO.

11.1.2 The requirement for the provision of landscaping for the OnSS, in line with the Final LEMP, and the requirement for a Final LEMP to be submitted and approved are set out within DCO Requirements 7 and 12 as set out below:

REQ 7 – PROVISION OF LANSCAPING

(1) Work No. 15B must not be commenced until a written landscaping scheme and associated work programme in accordance with the outline landscape and ecology management plan for Work No. 15 has been submitted to and approved by the relevant planning authority.

(2) The written landscaping scheme must include details of all proposed hard and soft landscaping works including—

- location, number, species, size and planting density of any proposed planting including any trees; and

- implementation timetables for all landscaping works within Work No.15.

(3) The landscaping must be carried out in accordance with the approved details.

REQ 12 – LANDSCAPE AND ECOLOGY MANAGEMENT PLAN

(1) No stage of the onshore works may commence until for that stage a written landscape and ecology management plan in accordance with the outline landscape and ecology management plan as appropriate for the relevant stage, has been submitted to and approved by the relevant planning authority.

(2) The landscape and ecology management plan(s) submitted under sub-paragraph (1) must include an implementation timetable and must be implemented as approved.

(3) Pre-commencement works must only take place in accordance with the relevant details set out in the outline landscape and ecology management plan as certified.

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PHONE 0333 880 5306
EMAIL fiveestuaries@rwe.com
WEBSITE www.fiveestuaries.co.uk
ADDRESS Five Estuaries Offshore Wind Farm Ltd
Windmill Hill Business Park
Whitehill Way, Swindon, SN5 6PB
COMPANY NO Registered in England and Wales
company number 12292474