

FIVE ESTUARIES OFFSHORE WIND FARM PRELIMINARY ENVIRONMENTAL INFORMATION REPORT

VOLUME 7, REPORT 5: LANDSCAPE AND ECOLOGY DESIGN PRINCIPLES PLAN

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DEFINITION OF ACRONYMS

Term	Definition	
CoCP	Code of Construction Practice	
DCO	Development Consent Order	
ECC	Export Cable Corridor	
HDD	Horizontal Directional Drilling	
ES	Environmental Statement	
LEDPP	Landscape and Ecology Design Principles Plan	
LEMP	Landscape and Ecological Management Plan	
LVIA	Landscape and Visual Impact Assessment	
NE	Natural England	
NERC	Natural Environment and Rural Communities	
OLEMP	Outline Landscape and Ecological Management Plan	
OnSS	Onshore Substation	
PEIR	Preliminary Environmental Information Report	
PRoW	Public Rights of Way	
RLB	Red Line Boundary	
SSA	Substation Search Area	
VE	Five Estuaries Offshore Windfarm	

1 LANDSCAPE AND ECOLOGY DESIGN PRINCIPLES PLAN

1.1 INTRODUCTION

1.1.1 This Landscape and Ecology Design Principles Plan (LEDPP) sets out the principles that will be followed when finalising landscape and ecology mitigation, compensation and enhancement measures for the proposed Onshore Substation (OnSS) and Onshore Export Cable Corridor (Onshore ECC) for the Five Estuaries Offshore Windfarm (hereafter referred to as VE).

1.2 **PURPOSE OF THE LEDPP**

- 1.2.1 The LEDPP makes reference to the project description, landscape and visual impact assessment and onshore biodiversity assessment that are reported in the following chapters of the Preliminary Environmental Information Report (PEIR):
 - > Volume 3: Chapter 1: Onshore Project Description
 - > Volume 3: Chapter 2: Landscape and Visual Impact Assessment (LVIA)
 - > Volume 3: Chapter 4: Onshore Biodiversity and Nature Conservation
- 1.2.2 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.
- 1.2.3 The LEDPP is intended as an in-principle document to support the PEIR documents and assessments, and is the first step in a process which will continue to be developed as the design of the onshore elements of VE progresses. Further baseline ecology survey data will be available and shared through consultation with key consultees.
- 1.2.4 At PEIR stage, the LEDPP sets out the principles that will be used in the development of an Outline Landscape and Ecological Management Plan (OLEMP) that will be provided as part of the Development Consent Order (DCO) application. The OLEMP, in turn, will set out the key landscape and ecology elements that will be secured in the final Landscape and Ecological Management Plan (LEMP). The LEMP will be secured as a requirement of the DCO.

Table 1.1 Ecological and landscape information presented at project stages

PEIR	DCO Application	Post Consent
 LEDPP Substation zones and wider onshore export cable corridor Baseline ecology surveys ongoing Principles 	 OLEMP > Development of substation design and preferred cable route > Informed by baseline surveys and consultation > Provides outline measures 	 LEMP > Detailed scheme design and construction detail > Informed by pre- construction survey > Final details prior to construction



1.2.5 Further details in respect of the proposed approach to biodiversity gain are set out within Volume 5, Annex 4.14: Five Estuaries Offshore Wind Farm Onshore Biodiversity Net Gain Approach.

1.3 LANDSCAPE MITIGATION PRINCIPLES

PRIMARY MITIGATION

- 1.3.1 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.
- 1.3.2 The site selection process for the Landfall, onshore ECC and OnSS search areas considered constraints relating to physical landscape elements (such as woodlands, trees and hedgerows), landscape character, and visual amenity, together with other environmental and technical constraints. The sensitivity of the surrounding landscape and of residents, road-users, workers and recreational users of the landscape were also key considerations. 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. Using these considerations, the locations will be further refined for the DCO Application.

LANDFALL

1.3.3 At PEIR stage, there are two search areas for the Landfall, both of which are situated on the coastline between Frinton-on-Sea in the north-east and Holland-on-Sea in the south-west. One lies between Sandy Point and Chevaux de Frise Point on the Frinton-on-Sea side, while the other lies between Chevaux de Frise Point and Holland Haven on the Clacton-on-Sea side. While the removal and replacement of planting along the coastal edge will be avoided through the use of Horizontal Directional Drilling (HDD), there is the potential that some vegetation would be removed in association with the construction compound and access tracks.

ONSHORE ECC

1.3.4 While the two options extending from the Landfall at the coastline extend inland as far as Great Holland, from this point to the two OnSS search areas there is one search area for the onshore ECC being proposed at this PEIR stage. The combination of careful siting and the use of HDD within the search area will mean the onshore ECC will avoid the requirement of the removal of large areas of vegetation. There will, however, still be the removal of small-scale and localised patches of vegetation along the route, mostly comprising of hedgerows, but also occasional hedgetrees and trees in those instances where these cannot be avoided.



ONSHORE SUBSTATION

- 1.3.5 At PEIR stage, the two search areas being considered for potential locations for the OnSS are SSA West and SSA East. The search areas, indicative OnSS footprint locations and indicative mitigation planting for SSA West and SSA East are shown on Figures 2.6a and 2.6b respectively (see Volume 6, Annex 2.1: LVIA Figures). As the details of the Project have not been finalised, these figures show the indicative locations for the OnSS, indicative orientation of the buildings, and indicative mitigation planting. The indicative mitigation planting has been created to illustrate the approach, and types of measures that would be implemented to reduce the potential effects of the OnSS and enable a detailed assessment to be carried out, despite the layout currently not being fixed.
- 1.3.6 The close proximity of existing overhead electricity transmission lines to the SSA West search area and the relatively close proximity of existing electrical infrastructure at the existing Lawford Substation to the south of the SSA West search area, provide a context of electrical infrastructure in the area immediately surrounding this area. This context was considered in site selection and aligning with it is considered embedded mitigation.
- 1.3.7 While there is no existing substation close to the SSA East search area, there are existing overhead transmission lines to the south and north of this area which have an influence on the rural character.

CONSTRUCTION PHASE MITIGATION

- 1.3.8 Mitigation opportunities during the construction phase of works will be limited and primarily relate to the restrictions imposed on the working areas and measures identified in the Code of Construction Practice (CoCP), a draft version of which is provided in Volume 7, Report 3: Draft CoCP.
- 1.3.9 Sensitive siting of construction compound areas away from more visible and larger numbers of receptors, will also be important to reduce the impact on the immediate views. It should be noted that at PEIR stage, multiple construction compounds, trenchless crossing compounds, onshore Export Cable Corridor (ECC) routing options and access route options are included in the assessment of effects. These options will be refined post consultation on the PEIR taking on board consultation responses and following the approach already taken in site selection. This will ultimately reduce the potential effects on the landscape and visual resource of the area.

OPERATIONAL MITIGATION

- 1.3.10 Once the construction phases of the onshore elements are complete, replacement planting and new planting will be implemented in association with the landfall, onshore ECC and around the OnSS.
- 1.3.11 Landscape mitigation measures seek to avoid, reduce or offset temporary and permanent environmental effects, including those related to the landscape and visual resource. Landscape and visual effects change over time as mitigation establish and mature and existing landscape evolves, such as planting and restoration of habitat types included as part of the proposed onshore elements of VE.

REINSTATEMENT OF ONSS

1.3.12 Following decommissioning of the OnSS, it is expected the footprint and platform areas would be reinstated to agricultural land use with hedgerows reinstated.

ONSHORE ECC AND LANDFALL LANDSCAPE MITIGATION PRINCIPLES

- 1.3.13 As the final routing of the onshore ECC has not been selected ahead of the PEIR assessment, the landscape mitigation strategy for the onshore ECC has not yet been fully developed. A series of principles have, however, been identified to inform the strategy. Key landscape and visual considerations in the development of this mitigation strategy will include:
 - Achievement of the best environmental fit of the proposed onshore ECC where practicable, particularly in relation to reducing hedgerow and tree loss along the cable route;
 - > Reinstatement of removed sections of hedgerows;
 - Selection of shallow rooted species for planting above cables to prevent damage to underling cables;
 - Ensuring that the construction compound and HDD compound options are 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 areas in relation to reestablishment of ground cover;
 - Protection of all retained trees during the construction phase where practicable; and
 - Should footpaths or cycleways be temporarily disrupted by the proposed onshore ECC or Landfall then reinstatement would form part of the mitigation strategy.

REINSTATEMENT OF ONSHORE ECC

1.3.14 Following construction activities at 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, in line with guidance set out in the CoCP.

ONSS LANDSCAPE MITIGATION PRINCIPLES

BASELINE CONTEXT

1.3.15 The landscape context to the SSA West search area 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 SSA West search area, hedgerow planting has been implemented and will form a low screen as it gradually matures over 3 to 5 years. Along Grange Road, to the west of the SSA West search area, 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 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.



- 1.3.16 To the east of the SSA West search area, there are intermittent trees on both sides of Ardleigh road, such that open views across the adjacent farmland occur. To the north of the SSA West search area, a PRoW follows Barn Lane which is fairly well enclosed on the northern side by trees, scrub and hedgerows, whilst more intermittently open on the southern side.
- 1.3.17 Whilst the landscape context to SSA East also comprises predominantly arable farmland, in which enclosure has been eroded and fields amalgamated, there is a more substantial presence of woodland and tree cover which helps to screen the SSA East search area from certain aspects. Mulley's Wood forms a small block of woodland on the north-western boundary of the SSA East search area and Aldercar is a small woodland to the east of New Hall. There is also tree cover along field boundaries to the west and around the reservoirs to the east of SSA East search area which add to the extent of screening in these directions. To the south, tree cover extends along Mulberry Lane with intermittent hedgerows also occurring in sections.

OUTLINE PLANTING PRINCIPLES

- 1.3.18 Outline planting mitigation principles have been developed for both the SSA West and SSA East search areas, to complement the existing landscape structure in each area. These mitigation principles include areas of proposed woodland, areas identified for ecological mitigation in the form of habitat enhancement and areas with potential further planting following design progression and consultation.
- 1.3.19 The extent of the indicative proposed mitigation planting is presented in Volume 6, Annex 2.1: Landscape and Visual Impact Assessment Figures, Figure 2.6a for SSA West and Figure 2.6b for SSA East. The proposed mitigation planting is also shown on the LVIA visualisations in Volume 6, Annex 2.2: Landscape and Visual Impact Assessment Photomontages, Figures 2.11 to 2.16 for SSA West and Figures 2.17 to 2.22 for SSA East, to show the indicative height of the screening woodland after 15 years' establishment in the context of the assessed OnSS maximum parameters.

PROPOSED ONSS PLANTING

- 1.3.20 The proposed woodland comprises native woodland species and would be located around the OnSS.
- 1.3.21 The key aims of the proposed woodland planting in respect of SSA West are as follows:
 - > to provide visual screening to road users on Grange Road to the west and northwest and Ardleigh Road to the south and east of the SSA West search area;
 - > to provide visual screening to residents in the surrounding farmsteads and in rural properties on Ardleigh Road and the western side of Little Bromley; and
 - > to provide a woodland context to the SSA West search area that restores the historic enclosure of the farm fields and provides greater connectivity between the retained hedgerows and field boundary trees.
- 1.3.22 The key aims of the proposed woodland planting in respect of the SSA East are as follows:
 - to provide visual screening to road users on Bentley Road to the west and southwest and Clacton Road to the east of the SSA East search area;



- > to provide visual screening to residents in the surrounding farmsteads and in rural properties on Bentley Road and Clacton Road of the SSA East search area; and
- > to provide a woodland context to the SSA East search area that restores the historic enclosure of the farm fields and provides greater connectivity between the retained hedgerows, field boundary trees and local woodland blocks.
- 1.3.23 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 both SSA West and SSA East search areas, both of which are located in this area. Recommended tree species include field maple, hazel, hornbeam, hawthorn, wild cherry, blackthorn and common oak.
- 1.3.24 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 to 8.3 m in height. They would provide shelter to bring on core species, such as oak. 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 nearby woodlands.
- 1.3.25 Proposed woodland planting could be spaced to maximise growth rate and ultimate screening potential. An example of this would be plant approximately one plant per m² in natural groups and not too regimented (i.e. in randomly spaced species groups of 3, 5 and 7 plants), however the precise detail of these spacings should form part of the planting schedule at a more detailed stage.
- 1.3.26 Hedgerow planting would comprise species rich hedgerows using appropriate native species such as hawthorn and blackthorn. The proposed hedgerows and woodland planting could restore historic field boundaries and strengthen lines of existing field boundaries, connecting new planting to established woods in the area and thereby complimenting the existing landscape structure.
- 1.3.27 Indicative mitigation planting also includes areas of native meadows enclosed by the hedgerows and woodlands, 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.
- 1.3.28 The quality of the topsoil on the site has not been tested but given the existing and historical agricultural use, it is considered likely to be of good quality. 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.
- 1.3.29 It is expected that a standard 5 year maintenance period will be applied. The detail of replacing failed planting will be presented in the OLEMP and LEMP.

ADVANCE PLANTING

1.3.30 In locations where it is possible to undertake advanced planting as there would not be any interference with construction works, and where practical to do so, mitigation woodland could be planted during the early phases of the OnSS to ensure robust screening as early as possible. This advance planting if implemented at the start of the pre-construction phase would give the woodland in these areas additional growth prior to completion of construction and commencement of operation.

1.4 ECOLOGICAL MITIGATION AND COMPENSATION PRINCIPLES

- 1.4.1 Baseline ecological surveys have yet to be fully reported (and in some cases are ongoing) and the scheme design has yet to be finalised. However, it is clear at the time of writing that mitigation and compensation will be necessary for habitat loss and potentially for impacts to protected or notable species such as farmland birds, bats and water vole, in the vicinity of either of the proposed OnSS, Search Areas. The onshore ECC route is yet to be refined by ongoing engineering design work, which is in turn being informed by ongoing survey data analyses. Ecology mitigation options for the onshore ECC are also ongoing and will be confirmed in the Environmental Statement (ES) for the DCO application.
- 1.4.2 The definitions for the terms 'Mitigation', 'Compensation', and 'Enhancement' as used within this LEDPP and PEIR Chapter 4: Onshore Biodiversity and Nature Conservation are as follows:
 - Mitigation is used to refer to measures to reduce or remedy a specific negative impact *in situ*;
 - > Compensation describes measures taken to offset residual effects, i.e., where mitigation *in situ* is not possible; and
 - Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.
- 1.4.3 The intention at this stage, within this document, is to set out the guiding principles and as referenced in the landscape section, to illustrate how mitigation and compensation habitat could be incorporated in the vicinity of the OnSS, since this is where permanent habitat loss will occur and where efforts for compensation will focus. These initial recommendations for mitigation or compensation are preliminary and are subject to change, depending on results of further surveys and the final project design.
- 1.4.4 As stated in paragraph 1.2.4, an OLEMP, including details of mitigation and compensation measures for other sections of the ECC (where applicable), as well as further details of proposed measures at the OnSS, will be provided with the ES for the DCO application, once relevant surveys (for all species) have been completed and reported and proposed measures have been developed further. The OLEMP will also aim to define, and include details of, proposed biodiversity enhancements, noting that the measures outlined here are likely to represent a combination of mitigation, compensation and enhancement.
- 1.4.5 Outline details of ecological mitigation measures specific to construction activities are provided separately in the draft CoCP and are not included in this document.

MITIGATION/ COMPENSATION FOR IMPACTS ON IMPORTANT ECOLOGICAL FEATURES AT THE ONSS

- 1.4.6 The construction of the OnSS (in either Search Area) will primarily affect arable land but could result in the loss of mature trees and may affect habitats of principle importance for the purpose of conserving biodiversity under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (S41 habitats), such as hedgerows. It may also require a discharge point to the Holland Brook. Important species that may be affected are considered most likely to include S41 or red data book plant species in arable margins, bats, water vole, invertebrates, birds, reptiles, badger, brown hare, harvest mouse and/ or hedgehog.
- 1.4.7 Detailed species-specific mitigation and compensation measures are not included here, since they are reliant on survey information yet to be collated and reported, and more detailed scheme design. However, key principles that will be followed in order to mitigate and compensate for impacts, based on relevant data obtained to date, are provided. In addition, Volume 6, Annex 2.1: Figure 2.6a for OnSS SSA West and Figure 2.6b for OnSS SSA East shows, in principle, how planting could be undertaken at the indicative OnSS locations proposed to satisfy both landscape and ecological objectives.
- 1.4.8 **Principle 1. No net loss of bat roosting habitat.** Compensation roost features will be provided for every moderate or high potential roost feature prior to loss, regardless of whether bat roosts are confirmed by survey data. These may include bat boxes on retained trees or installed poles, re-use of whole felled trunks by setting vertically as monoliths and/ or veteranisation (cutting and carving into healthy trees to mimic nature, to speed the process of decay and rot holes) as appropriate.
- 1.4.9 Compensation roost 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 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, and subject to any Natural England (NE) licence requirements.
- 1.4.10 **Principle 2. No net loss of potential water vole habitat at the Holland Brook.** If bankside works are necessary for drainage purposes, then permanent habitat loss shall be mitigated or compensated for by the creation of new habitat or the improvement of existing habitat, in advance of any loss. This could include measures such as mink control, removal of scrub, creation of new ponds or channels. An NE licence would be sought in advance if necessary, depending on the type and scale of impacts.
- 1.4.11 **Principle 3. No net loss of S41 habitats including arable field margin, lowland meadow and/ or hedgerow.** Hedgerow loss will be compensated for via creation of new species-rich hedgerows comprising locally appropriate species. These will be located so as to link or buffer existing woodlands, scrub and hedgerows as well as proposed new woodland planting.

- 1.4.12 Arable field margins are a temporary habitat within a given location, depending on the agricultural management of particular fields; many species in this habitat type require disturbance in order to persist. Rotational management of specific areas at the OnSS shall be considered to ensure that at least an equivalent area of arable margin habitat is maintained across the OnSS area as whole.
- 1.4.13 Loss of lowland meadow, if it occurs, would be compensated for via creation of new lowland meadow, comprising locally appropriate species. This may include a variety of measures such as (but not limited to):
 - > harvesting a green hay crop from the area being lost for use as seed on the compensation area;
 - > Salvage of turves from the area being lost for re-use on the compensation area;
 - Subsoiling in order to create the soil conditions required for meadow establishment; and
 - > Seeding using a locally appropriate species mixture.
- 1.4.14 **Principle 4. Maintenance of green and blue infrastructure network.** Where hedgerow removal or drainage works permanently interrupt or sever existing links, these will be reinstated as close as possible to the originals. The reinstated habitats will link into the retained green and blue infrastructure network.

SEEK ENHANCEMENTS

- 1.4.15 In addition to the above mitigation and compensation measures, the scheme design will seek to enhance biodiversity. The list of potential measures below is not exhaustive and may change depending on the detailed design of the project, the results of further survey work and land ownership constraints. It is also possible that enhancements may be provided elsewhere within the onshore ECC or the local area, outside the Red Line Boundary (RLB). Full details will be provided in the ES and OLEMP.
 - Increase habitat connectivity via restoration of historic field margins with new species rich hedgerows or gap-planting existing hedgerows, with a specific focus on providing habitat for notable species which may be present in the relevant areas.
 - New woodland creation and maintenance, to link and/ or fortify the existing habitat network, i.e., within Habitat Network Areas¹ (Edwards, J *et al* 2020) thereby also assisting toward maintenance and enhancement of the green infrastructure network, if possible.
 - > Drainage features designed to meet wildlife needs as well as water management requirements.
 - > Brash piles and log piles created to serve as hibernaculae and places of shelter for reptiles, amphibians and small mammals.

¹ Natural England Network Expansion Zones, Network Enhancement Zones 1 and 2 and Fragmentation Action Zones are located within the survey area. These areas are intended to help identify areas for potential future habitat creation and restoration.



- > Pond and wetland creation and maintenance for use by amphibians, reptiles and water vole.
- > Creation and maintenance of sheltered wildflower meadows and glades, including dry stony areas for use by invertebrates and nesting/ foraging bird species.
- > Installation of bird and bat boxes at appropriate trees/ woodland.
- > Creation and management of habitats to benefit notable bird species, such as turtle dove, in conjunction with other local initiatives, where possible.
- > Ecological improvements to water courses, such as removal of man-made elements or artificial barriers, where practical.
- > Conducting biodiversity improvement works to existing woodland and
- Conduct biodiversity improvement works in respect of increasing populations of hog's fennel for use by Fishers estuarine moth, where possible.
- 1.4.16 All such efforts will also seek to provide a minimum of 10% net gain for biodiversity, as measured by the Defra Metric 3.1 or its successor. Refer to Volume 5, Annex 4.14: Five Estuaries Offshore Wind Farm Onshore Biodiversity Net Gain Approach for further details in respect to the approach to biodiversity gain.

MONITORING AND MANAGEMENT

All habitats created as part of ecological mitigation/ compensation, or to provide enhancement, will be subject to monitoring and ongoing management to ensure that aims and objectives are met. Remedial or additional measures would be implemented if mitigation/ compensation/ enhancement measures prove unsuccessful. Further details of ongoing management and monitoring will be provided in the OLEMP, to be included with the ES.

1.5 **REFERENCES**

- Edwards J, Knight M, Taylor S & Crosher I. E (May 2020) 'Habitat Networks Maps, User Guidance v.2' Natural England.
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