Frodsham Solar

Outline Landscape and Ecology Management Plan

May 2025

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1.0 INTRODUCTION

1.1 Purpose of the oLEMP

1.1.1 This document is the **outline Landscape and Ecology Management Plan** ('**oLEMP**') [**EN010153/DR/7.13**] for the Frodsham Solar Farm ('the Proposed Development'). The **oLEMP** is part of the information that accompanies the DCO Application for the Proposed Development. It sets out a framework for the successful implementation, establishment and longer-term management and maintenance of the proposed landscape and ecological works that form a key part of the Proposed Development.

1.1.2 Should the Proposed Development be consented, then the DCO will require that a final Landscape and Ecology Management Plan ('final LEMP') is produced and agreed with the local planning authority (Cheshire West and Cheshire Council ('CWaCC'). Details regarding the agreement of proposals within the Non Breeding Bird Mitigation Area ('NBBMA') are set out in **Appendix B**. The Proposed Development must be undertaken in accordance with the approved plan. This is secured via a Requirement in Schedule 2 of the **draft DCO [EN010153/DR/3.1]**.

1.1.3 The design of the Proposed Development has followed an iterative approach, which includes the identification of key landscape and ecological features to be retained and enhanced where feasible, along with opportunities to create new features. Measures to mitigate against adverse environmental effects, and to enhance the baseline environment, also form part of the design. For further details of the design process, refer to the **Design Approach Document** ('**DAD**') [**EN010153/DR/5.8**]. For further details of environmental effects, including mitigation and enhancement measures, refer to the **Environmental Statement** ('**ES**') [**EN010153/DR/6.1**].

1.1.4 Retained and proposed landscape and ecological features within the Order Limits will be managed and maintained through the life of the Proposed

Development (including during construction and decommissioning) unless otherwise stated in **Section 6.0**.

1.1.5 The **oLEMP** also provides an overview as to how habitats specified within the **Biodiversity Net Gain Report** ('**BNG Report**') [**EN010153/DR/7.12**] will achieve their targeted habitat type and conditions within the anticipated timeframe. The **oLEMP** outlines appropriate monitoring criteria and commits to identifying remedial/contingency measures to be implemented in the event that these targets are not achieved. Habitat condition assessment sheets for the relevant habitats are provided as **Appendix C**.

1.2 Other Relevant Documents

1.2.1 The DCO Application is accompanied by a series of documents, plans and strategies that that explain how Frodsham Solar Limited ('the Applicant') will ensure that the Proposed Development is built, operated, and decommissioned in a way that accords with the overall Design Vision and Project Design Principles as set out in the **DAD [EN010153/DR/5.8]**, and reflects the committed mitigation measures and enhancement identified in the **ES**. These are:

i) **Design Parameters Statement** [**EN010153/DR/7.1**] ('**DPS**') which sets out the design parameters within which different components of the Proposed Development must be implemented / maintained.
ii) **Works Plans** [**EN010153/DR/2.3**] which set out the location of the different components of the Proposed Development as set out in Schedule 1 of the draft DCO.
iii) **Outline Construction Environmental Management Plan** ('**oCEMP**') **[EN010153/DR/7.5]** which explains how the Applicant would manage and report the potential environmental effects of the Proposed Development during the construction period.
iv) **Outline Operational Environmental Management Plan** ('**oOEMP**') **[EN010153/DR/7.6]** which explains how the Applicant would manage and

report the potential environmental effects of the Proposed Development once it becomes operational.

v) **Outline Decommissioning Environmental Management Plan** ('**oDEMP**') [**EN010153/DR/7.7**] which explains how the Applicant would manage and report the potential environmental effects of the Proposed Development during the decommissioning period.

vi) **Outline Public Rights of Way Management Plan** [**EN010153/DR/7.9**] which describes how the public rights of way ('PRoW') running through the Order Limits will be managed by the Applicant.

vii) **BNG Report** [**EN010153/DR/7.12**] which describes how the Proposed Development would achieve a minimum increase of 10% in habitat and hedgerow units and no net loss in watercourse units, when excluding the NBBMA. When taking into account the NBBMA the Proposed Development achieves a minimum increase of 10% in habitat, hedgerow and watercourse.

1.2.2 Should the Proposed Development be consented, then the DCO will require that final versions of these documents are produced and agreed with CWaCC, and other key stakeholders as necessary. The final documents will be in substantial agreement with the outline documents. The Proposed Development must be undertaken in accordance with the approved plans. This is secured via a Requirement in Schedule 2 of the **draft DCO [EN010153/DR/3.1]**.

1.2.3 The **ES** includes other plans and documents that illustrate and/or explain aspects of the Proposed Development. Of particular relevance to the **oLEMP** are:

i) **ES Vol 3 Figure 2-1: Indicative Construction Site Layout [EN010153/DR/6.3]** which sets out the indicative layout of works within the Order Limits during construction.

ii) **ES Vol 3 Figure 2-2: Indicative Operational Site Layout [EN010153/DR/6.3]** which sets out the indicative layout of development

within the Order Limits once operational (being one way in which the Design Parameters and limits of deviation on the Works Plans could be built out).

iii) **ES Vol 3 Figure 2-3: (a-e) Illustrative Environmental Masterplan (IEM) [EN010153/DR/6.3]** which sets out the location of proposed environmental mitigation enhancement measures. The **IEM** is included as **Appendix A** to the **oLEMP**.

iv) **ES Vol 2 Appendix 9-1: Flood Risk Assessment and Drainage Strategy [EN010153/DR/6.2]** which describes the proposed measures to be implemented in respect of surface water drainage and how these will be managed.

1.3 Consultation

1.3.1 Consultation with stakeholder groups and members of the public has been carried out, both formally and informally, as part of the design development process. Of relevance to the **oLEMP** was consultation held with:

i) Natural England ('NE').
ii) CWaCC.
iii) Cheshire Wildlife Trust ('CWT').
iv) Environment Agency.
v) National Grid.
vi) United Utilities.
vii) SP Energy Networks.
viii) Frodsham Town Council ('CWT').

1.4 Structure of the oLEMP

1.4.1 The **oLEMP** is structured as follows:

i) **Section 1.0: Introduction** provides introduction and context to the document.

ii) **Section 2.0: The Order Limits** describes the landscape and ecological context of the Order Limits and their surroundings.

iii) **Section 3.0: Proposed Development** describes the proposed works.

iv) **Section 4.0: Design Approach and Design Principles** sets out the design vision and project design principles that the Proposed Development will fulfil.

v) **Section 5.0: Roles and Responsibilities** sets out the roles and responsibilities of those involved in implementing the final LEMP.

vi) **Section 6.0: Management and Maintenance** sets out details of the works required to implement and maintain the landscape and ecology proposals, including planting and seeding specifications.

vii) **Section 7.0: Monitoring and Review** sets out details of how the measures included in the final LEMP would be monitored and reviewed during the life of the Proposed Development.

viii) **Appendix A: Illustrative Environmental Masterplan** illustrates the spatial extent of the proposals.

ix) **Appendix B: Outline Non-Breeding Bird Mitigation Strategy** sets out an overview of implementation, management and monitoring requirements within the Non-Breeding Bird Mitigation Area

x) **Appendix C: Condition Assessment Sheets** sets out the condition assessment requirements for each of the proposed habitat types, reflecting the templates published by the Department for Environment, Food & Rural Affairs (‘DEFRA’).

2.0 THE ORDER LIMITS

2.1 Introduction

2.1.1 The Order Limits cover approximately 337.5 hectares of land within Frodsham Marshes, as illustrated on **ES Vol 3 Figure 1-1: Site Location [EN010153/DR/6.3]**. The Order Limits comprise a series of distinct sub-areas which are illustrated on **ES Vol 3 Figure 1-2: Proposed Development Areas [EN010153/DR/6.3]**, as follows:

i) Solar Array Development Area ('SADA').
ii) Main Site Access.
iii) Non-Breeding Bird Mitigation Area ('NBBMA').
iv) Skylark Mitigation Area.
v) SPEN Grid Connection.
vi) SPEN Substation Access.

2.1.2 The SADA is the principal component of the Proposed Development. It is located at the eastern end of Frodsham Marshes, between the Mersey Estuary and the M56. The northern boundary of the SADA is formed by the River Weaver, and the north-western boundary by the Manchester Ship Canal, with the Mersey Estuary lying beyond. The western boundary of the SADA is formed by two of the former Manchester Ship Canal Dredging Deposit Cells (Cell 3 and Cell 6). The southern boundary of the SADA is formed by agricultural fields and the M56 motorway.

2.1.3 The SADA comprises three relatively distinct areas:

i) The Eastern Cluster of Frodsham Wind Farm: This area forms the western half of the SADA. Six operational wind turbines with a maximum height of 125m to blade tip, are located in this area. The land forms part of the former Manchester Ship Canal Dredging Deposit Ground, and includes Cells 1, 2 and 5. The cells have been restored to agricultural land and are

now grazed by sheep / cattle. The land in this area lies between approximately 9.5m and 12.5m above ordnance datum (AOD).

ii) Former agricultural land used by Frodsham Wildfowlers: The central area of the SADA is former agricultural land which has been left fallow and managed to encourage use by wildfowl. This area is currently used for recreational shooting by Frodsham Wildfowlers. This area of the Site is crossed by a series of ditches which have been used to drain and manage water levels on Frodsham Marsh. The land in this area lies at approximately 6m AOD.

iii) Agricultural land: The south-eastern portion of the SADA is agricultural land. It is understood that the land has been used for growing crops and silage. Some areas of the fields appear to have been left fallow and have been colonised with scrub and wet grassland. Hedgerows demarcate boundaries between field units. The land in this area lies at approximately 5m AOD.

2.1.4 The Main Site Access runs from the west, leaving the public highway via Pool Lane roundabout and turning onto Grinsome Road (a private road). Vehicles would travel east for approximately 1.5km, turning north at Grinsome Road Roundabout, onto Road 1 of Protos. Vehicles would then turn east along Marsh Lane which leads to Frodsham Wind Farm. The Frodsham Wind Farm access tracks provide access to the SADA.

2.1.5 The NBBMA is located on Cell 3 of the Manchester Ship Canal Dredging Deposit Cells and adjacent areas of ponds and grassland. It is immediately west of the SADA.

2.1.6 The Skylark Mitigation Area is located within an arable field to the south of the SADA.

2.1.7 The SPEN Grid Connection would run from the SADA to the existing Frodsham National Grid Substation. The connection would cross over the River Weaver.

2.1.8 The SPEN Substation Access follows an existing dedicated private access road running north from the A56 to the substation complex.

2.2 Land Use

2.2.1 The SADA comprises agricultural and former agricultural land. The Main Site Access and the SPEN Substation Access both comprise existing private access roads. The NBBMA comprises existing farmland and wetland. The SPEN Grid Connection would cross over the River Weaver.

2.2.2 A series of Public Rights of Way (PRoW) cross the Order limits; these are illustrated on **ES Vol 3 Figure 1-5: Public Rights of Way [EN010153/DR/6.3]**. The PRoWs include footpaths and restricted byways, which allow access by walkers, riders and cyclists. National Cycle Route 5 runs along a section of the Main Access Route and along part of the southern edge of the SADA.

2.2.3 The SADA is crossed by a series of utilities including above and below ground high voltage electricity transmission lines, high pressure gas lines, water distribution mains, telecommunication lines and private pipelines associated with nearby petrochemical plants.

2.2.4 The closest settlement is Frodsham on the south side of the M56, approximately 140m from the SADA. To the south-west of Frodsham lies Helsby, approximately 2km from the SADA. Both Frodsham and Helsby lie at the foot of the northern extent of the Cheshire Sandstone Ridge, which rises to a height of approximately 150m to the south of Frodsham and Helsby. To the north and north-east of the SADA, on the north bank of the River Weaver/Weaver Navigation, is Runcorn.

2.2.5 There are large areas of industrial development along this section of the River Mersey corridor. The northern bank of the River Weaver/Weaver Navigation is occupied by the INEOS Inovyn Runcorn Site which produces a range of chemicals for industrial use. The INEOS Inovyn Runcorn Site also includes

an 800MW gas-fired power station. The Runcorn Energy from Waste Plant operated by Viridor is further to the north.

2.2.6 To the west of the SADA is the Western Cluster of Frodsham Wind Farm comprising 13 no. wind turbines with the same maximum height as the Eastern Cluster). Further development in the marshes is located to the west of the Wind Farm and this includes Stanlow Oil Refinery, the Former CF Fertilisers Plant (decommissioned during 2022), Encirc Glass, and a series of different renewable energy and energy management facilities at Protos (some existing, some under construction, with further development proposed).

2.2.7 As set out above, the Manchester Ship Canal forms the northern boundary of the Order Limits and is separated from the Mersey Estuary by Frodsham Score, a 100m-200 m wide strip of low-lying marshland. The Mersey itself is a wide body of water, and the northern shore is approximately 2.65km from the SADA.

2.3 Landscape Context

2.3.1 *A Landscape Strategy for Cheshire West and Chester Borough*[1] ('CWaCC Landscape Strategy') describes and classifies the landscape of the CWaCC area. Urban areas are excluded. The Order Limits are located almost entirely within LCA 4a: Frodsham, Helsby and Lordship Marshes. The western end of the Access Road extends into LCA 9a: Dunham to Tarvin Plain. LCA4a is where change in the landscape resulting from the Proposed Development would occur and hence is the most relevant LCA for the design process.

2.3.2 Key perceptual/visual sensitivities, qualities and values for LCA4a are:

i) The flat landform and long views contribute to the perception of a large scale, exposed landscape.
ii) Presence of man-made embankments foreshorten views to the north across the Mersey Estuary.
iii) Important views to and from the Frodsham Sandstone Ridge and Helsby Hill.
iv) The consistent field pattern through planned enclosure gives the perception of a reclaimed, tamed landscape.
v) Vegetation-fringed ditches and rough ground and lagoons provide texture in the landscape.
vi) Parts of the marsh are remote, but the presence of traffic on the M56 motorway brings noise and movement to the area; the presence of birds and proximity to John Lennon Airport also contribute to noise and movement.
vii) Sense of naturalness of the marsh is diluted by man-made features and development.

[1] Bayou Bluenvironment and The Planning & Environment Studio (2016). *A Landscape Strategy for Cheshire West and Chester Borough*. Cheshire West and Chester Council. *Available at https://www.cheshirewestandchester.gov.uk/residents/planning-and-building-control/total-environment/local-landscape-character-assessment-landscape-strategy-2016 [Last Accessed 15 July 2024]*

viii) No prominent skyline, but embankments, pylons and industrial development are visually prominent.

ix) The open character means there is little opportunity for screening any large scale elements or for mitigating visual impact without the mitigation measures in themselves being highly visible - making it a visually sensitive landscape. There are relatively few sensitive visual receptors in the area, limited to a few residential properties and users of the PRoW network, but in adjacent areas overlooking the marsh there are views from Frodsham and Helsby as well as visitors to the viewpoints at the top of Helsby Hill and the War Memorial above Frodsham.

2.3.3 The landscape condition of LCA 4a is identified as follows:

"Although much of the area is actively farmed, the degraded hedgerows and broken fencing shows this to be a landscape in need of improved management. Some land to north of Lordship Lane remains in use for canal dredgings and has undergone change as a result of the preliminary works for the permitted windfarm. Wet grassland species have been lost and ditches are eutrophic as a result of the intensive agricultural use of the land".

2.3.4 The overall management strategy for LCA4a is:

"…to enhance and restore the conditions of habitats and features of the marshes whilst safeguarding its open character"

2.3.5 More detailed guidelines for landscape management and for built development within LCA4a are:

i) Encourage recreational development as a means of managing some of the more derelict and degraded areas of the landscape. Encourage use of the area by walkers, cyclists, rowers and horse riders (including provision of picnic facilities and viewing opportunities) whilst safeguarding the nature conservation interest of the area, particularly its importance for birds.

ii) Maintain the distinctive field pattern that reveals the planned 19th century enclosure of the marsh.
iii) Seek to restore thorn hedgerows that are falling into decline.
iv) Maintain and ecologically enhance the ditch system and riparian habitats and land supporting breeding, over wintering and passage birds. Seek opportunities to re-create habitats such as species rich grassland and reed beds.
v) Increase the biodiversity of intensively managed grassland and arable land – create and link buffer strips along linear features such as hedgerows and ditches to create a continuous network of wildlife corridors.
vi) Improve water quality by encouraging less-intensive agricultural practices to reduce fertiliser run-off and nutrient levels in the ditches.
vii) Encourage restoration of derelict industrial land including re-creation of salt-marsh and reintroduction of grazing to maintain the open character of the marsh.
viii) Consider opportunities to create views across the Mersey Estuary.
ix) Conserve the 'remote' character of the marshes away from the main transport corridor of the M56.
x) Retain the open character of the marsh by restricting planting to low growing scrubby species typically found in the local landscape, taking into account the importance of the area for ground nesting birds and wintering/passage birds. Woodland planting /screening using tall or ornamental species is not appropriate in the open marsh.
xi) Conserve the remaining open, undeveloped areas of the marsh.
xii) Consider using native scrubby vegetation to screen views of traffic on the north side of the M56 motorway (taller species may be appropriate on the southern side of the motorway adjacent to the Helsby to Frodsham Undulating Enclosed Farmland).
xiii) Consider views to and from the Frodsham Sandstone Ridge and Helsby Hill when planning any change.

2.4 Ecological Context

2.4.1 Two internationally designated sites are located within 2km of the SADA, namely:

i) Mersey Estuary Special Protection Area ('SPA').
ii) Mersey Estuary Ramsar.

2.4.2 Four nationally designated sites are located within 2km of the SADA, namely:

i) Mersey Estuary SSSI.
ii) Flood Brook Clough SSSI.
iii) Dunsdale Hollow SSSI.
iv) Runcorn Hill LNR.

2.4.3 A small part of the Mersey Estuary SSSI overlaps the north-western edge of the SADA.

2.4.4 The Mersey Estuary is thus protected at both international and national level for its nature conservation interest.

2.4.5 Eighteen non-statutory Local Wildlife Sites (LWS) designated at local level are located within 2km of the SADA. The Frodsham, Helsby and Ince Marshes Local Wildlife Site ('LWS') extends across the majority of the SADA, the whole of the Skylark Mitigation Area, and sections of the Main Access Route.

2.4.6 The SADA largely comprises areas of neutral grassland, arable land and modified grassland, separated by ditches, watercourses, hedgerows and tree lines. Also present are areas of reedbeds, scrub, ponds, woodland and existing tracks/roads.

2.4.7 Ecological surveys (desk studies and field surveys) have established that the SADA supports a minimum of six species of bat (foraging and commuting), water vole, badger, common toad and a range of invertebrate species. The SADA also has the potential to support roosting bats, eels and other fish, brown hare, otter and European hedgehog.

2.4.8 Ornithological field surveys have confirmed that the SADA supports a range of bird species, including qualifying species for the Mersey Estuary SPA/Ramsar. A number of other bird species that are not qualifying features of the SPA/Ramsar have also been identified as either breeding within or near to the SADA, or wintering within the SADA.

2.4.9 The NBBMA predominantly comprises neutral grassland; areas of neutral grassland located towards the south and west of this area also contain scattered scrub and tall forbs. Also present are a number of ponds, ditches, reedbeds, scattered broadleaved trees and unsealed tracks.

3.0 THE PROPOSED DEVELOPMENT

3.1 Introduction

3.1.1 The Proposed Development comprises solar PV panels capable of generating more than 50MW of electricity, with a BESS facility and on-site Frodsham Solar Substation. The Proposed Development includes two potential locations for the BESS and Frodsham Substation, the decision made on which option to bring forward will be made at the detailed design stage.

3.1.2 The solar PV panels would be mounted in groups on a metal frame which would be fixed in position with panels facing south. The solar PV panels, BESS and Frodsham Solar Substation would be connected to one another by a series of below ground cables. Supporting infrastructure would include transformers, inverters, switchgear, security fencing, CCTV, internal access roads, fire suppression system. The BESS and Frodsham Solar Substation would also require security lighting and fire suppression systems.

3.1.3 The Main Site Access would follow existing private roads and tracks, and would join the public highway network at Pool Lane Roundabout

3.1.4 Electricity would be exported to the local distribution network via a series of above ground and below ground cabling running to the Frodsham SPEN Substation. This would include an above ground crossing over the River Weaver. Above ground cabling would be supported on wooden poles.

3.1.5 A separate underground private wire connection is provided for, which would follow the route of the Main Site Access. This would enable electricity generated by the Proposed Development to be exported directly to local businesses.

3.1.6 Works to retain, enhance, and create new green infrastructure would be carried out, including measures to maintain this for the life of the Proposed Development. These are set out in the following sections of this **oLEMP**.

4.0 DESIGN APPROACH AND DESIGN PRINCIPLES

4.1 Design Approach Document

4.1.1 The **DAD [EN010153/DR/5.8]** which also forms part of the DCO Application submission documents describes the following:

i) The approach that the Applicant has taken to design from the outset of the project.
ii) The Design Vision and Design Principles that have influenced decision making.
iii) The design evolution that has resulted in the development that is being applied for.
iv) How design measures will be secured through the provisions of the DCO.
v) The framework for delivering on design post-consent.

4.1.2 This **oLEMP** provides further detail regarding bullets iv) and v) in respect of the green infrastructure proposals within the Proposed Development.

4.2 Design Vision

4.2.1 The Design Vision for the Proposed Development is set out in the **DAD [EN010153/DR/5.8]**, as follows:

"We want to deliver a substantial amount of renewable energy to the National Grid and to local businesses, making a clear contribution towards national renewable energy targets.

We want to conserve and enhance the local environment, provide a benefit to local communities, and to be a responsible neighbour to local people, during the construction, operational and decommissioning stages of the project.

We will follow a clear design process from start to finish, reflecting project-specific design principles, demonstrating collaborative interdisciplinary working, engagement with stakeholders and local communities, and delivering good design outcomes that we will commit to delivering".

4.3 Project Design Principles

4.3.1 To achieve the Design Vision, a series of Project Design Principles have been identified and broken down into more detailed measures in the **DAD [EN010153/DR/5.8]**. The Project Design Principles are secured via the **draft DCO [EN010153/DR/3.1]**. Not all have direct relevance to the **oLEMP**. Those that do are set out below:

i) Project Design Principle 2: Landscape and Views. Develop the proposals in a manner sensitive to their landscape setting and reflecting the value placed on the landscape by local communities, reducing visual impacts from nearby properties, recreational routes and key viewpoints.

a) Retain and enhance the open character of Frodsham Marshes, where feasible.
b) Retain and enhance existing vegetation cover that defines character and provides visual screening.
c) Undertake new planting of trees, scrub and hedgerows which is consistent with character and to provide further screening.
d) Contain development within established field boundaries to retain landscape pattern.
e) Provide development-free buffers alongside existing landscape features.
f) Provide long-term management and maintenance of the landscape of the Order Limits.
g) Retain open vistas looking across Frodsham Marshes and the wider estuary, where feasible.
h) Give consideration to impacts upon the long-range views from Frodsham War Memorial and Helsby Hill.
i) Consider, and seek to mitigate where possible, adverse impacts upon views from properties, with particular reference to those located at closer distances such as at the northern edge of Frodsham.

j) Consider potential impacts arising from glint and glare and mitigate if adverse effects are identified.

ii) Project Design Principle 3: Biodiversity and Green Infrastructure. Protect and enhance green infrastructure within the Order Limits and in doing so create the conditions for enhanced biodiversity locally.

a) Achieve a minimum of 10% increase in habitat and hedgerow units, and no net loss in watercourse units.
b) Manage, maintain and increase vegetation cover within the Order Limits for the lifespan of the Proposed Development.
c) Provide mitigation associated with potential impacts on the Mersey Estuary SSSI, SPA and Ramsar site.
d) Retain and enhance existing site features, and introduce development-free buffers around hedgerows, ditches and other features of biodiversity value. Buffers will be a minimum of 5m around hedgerows and a minimum of 10m around watercourses.
e) Reduce impacts on valuable habitat features through good design, e.g. minimising culvert crossings, avoidance of impacts on high value habitat, best practice construction methods.
f) Enhance ecological connectivity, both within the Order Limits and with features outside its boundary. Create and/or enhance wildlife corridors.
g) Provide interpretative material to explain the ecology of the Order Limits to visitors.

iii) Project Design Principle 4: Public Access and Recreation. Retain, enhance and encourage public access through the life of the proposals, including during construction and decommissioning where feasible.

a) Create new permissive pathways to link up existing routes, filling gaps in the existing network and creating loops where possible, to enhance appeal to users and to improve connectivity.
b) Provide wayfinding signage and information about the variety of routes available within the Order Limits and in respect of onward

connections. Information to consist of both physical signage on site and published material to provide guidance to potential visitors.

c) Design and install interpretative material along access routes, providing information regarding the social and natural history of the Order Limits and its present use for generating energy.

d) Provide and signpost potential formal public car parking area(s) within the Order Limits, where provided.

iv) Project Design Principle 6: Cultural Heritage. Develop the proposals so that they are sensitive to the presence of heritage assets, their settings, and the wider historic environment.

c) Maintain views from the Order Limits (and their surroundings) to heritage assets located on the higher ground.

d) Retain the legibility of the flat topography within the Order Limits and views to the river in views from the higher ground.

e) Provide interpretative material explaining the relationship between the Order Limits and the surrounding historic landscape.

4.4 Utility Easements and Other Buffers

4.4.1 A number of utilities cross the Order Limits which are shown on ES Vol 3 Figure 1-6: Utilities [EN010153/DR/6.3]. Easements are in place to enable the utility providers to access and maintain these, and the design of the Proposed Development secures this through the limits of deviation set out on the **Works Plans** [**EN010153/DR/2.3**] and the protective provisions of the **draft DCO** [**EN010153/DR/3.1**]. The easements are as follows:

i) Shell Grangemouth to Stanlow Pipeline: 3.05m either side of the pipe from the pipe edge.

ii) Shell/Essar Stanlow to Carrington Pipeline: 30.48m diameter for above ground pipe sections and 10m diameter for below ground section.

iii) Essar Stanlow to Runcorn: 30.5m either side of the pipe from the pipe edge.

iv) Buried gas supply: 6.0m easement centred on pipe with additional 3m access strip either side of easement.
v) Private water main: 6.0m centred on pipe.
vi) Windfarm HV Cables: 10.0m centred on the cable. 132kV Private Wire Connection will lie within this easement.
vii) Wind turbines. No dig within 10m diameter. No extraction or excavation within 75m diameter. No extraction or excavation deeper than 5m within 75m to 100m diameter.
viii) 400kV National Grid Overhead Line: 30m diameter from the tower base.
ix) 132kV SPEN Overhead Line: 30m diameter from the tower base.

Other Buffers

4.4.2 In addition, buffers to protect key environmental features will be adopted where practicable, as follows:

i) A 10m buffer between fencing surrounding solar PV modules and non-tidal watercourses.
ii) An 8m buffer surrounding retained ponds and reedbeds.
iii) A 16m buffer between fencing surrounding solar PV modules and tidal watercourse defence structures.
iv) A 6m buffer between fencing surrounding solar PV modules and hedgerows / areas of substantial vegetation.
v) A 10m buffer between fencing surrounding solar PV modules and public rights of way.
vi) A 10m buffer from the toe of existing earth bunds surrounding the Manchester Ship Canal Dredging Deposit Cells, to safeguard the stability of these structures.

4.4.3 These buffers have been applied to the development areas shown on the Works Plans [**EN010153/DR/2.3**].

4.5 Biodiversity Net Gain Objectives

4.5.1 While the Proposed Development is not subject to statutory BNG requirements, the Proposed Development has committed to achieving an increase of at least 10 % in both habitat and hedgerow units across the Site, together within no net loss of watercourse units, when excluding the NBBMA. With the NBBMA also taken into account the Proposed Development has committed to achieving at least 10% increase in watercourse units as well.

4.5.2 The implementation of the landscape and ecological works and their subsequent management will ensure the Proposed Development meets the above objectives (i.e., achieving the stated habitat type and condition), as summarised in **Table 1** overleaf. **Table 1** will serve as a guide to the future management and monitoring of created habitats, outlines timescales in which the objectives should be achieved, and offers a direct comparison between the habitats shown on the **IEM** (**Appendix A** of this document) and the habitat types utilised for the Biodiversity Metric for the Proposed Development. Additional details of the BNG Assessment are provided in the **BNG Report [EN010153/DR/7.12]**.

4.5.3 The habitat types and conditions set out in **Table 1** are in accordance with the Biodiversity Metric for the Proposed Development, which utilised DEFRA's Statutory Biodiversity Metric Calculator[2]. Target condition, and the associated targeted criteria, are measured in accordance with the relevant condition assessment sheets for the particular habitat, as issued alongside the Statutory Biodiversity Metric (July 2024 version)[3] and provided in **Appendix C**. Time to target condition is pre-set within the Biodiversity Metric, and is the timeframe in which it is expected the habitat type and condition would be achieved.

[2] Department for Environment, Food & Rural Affairs (2023, last updated 21 Feb 2025). *Statutory Biodiversity Metric tools and guides*. [online] https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides [accessed 11 Apr 2025]
[3] Department for Environment, Food & Rural Affairs (2023, last updated 21 Feb 2025). *Statutory Biodiversity Metric tools and guides*. [online] https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides [accessed 11 Apr 2025]

Table 1: Summary of Biodiversity Net Gain Objectives

Landscape Habitat Type	BNG Habitat Type	Condition Sheet	Target Condition	Targeted Criteria	Time to Target Condition (Years)
Proposed native woodland	Other woodland; broadleaved	Woodland	Poor	N/A – poor condition targeted	5
Proposed native woodland	Lowland mixed deciduous woodland	Woodland	Poor	N/A – poor condition targeted	10
Neutral grassland (NBBMA)	Other neutral grassland	Grassland (Medium, high and very high distinctiveness)	Moderate	A, B, C, D	5
Marshy grassland (NBBMA)					
Retained neutral grassland/grazing within solar array security fence line[4] (and elsewhere within the SADA)					
Skylark Mitigation Area			Good	A, B, C, D, E, F	10
Retained neutral grassland/grazing within solar array security fence line[5] (and elsewhere within the SADA)	Modified grassland	Grassland (Low distinctiveness)	Good	A, B, C, E, F, G	7
			Moderate	C, E, F, G	4
Reedbed	Reedbeds	Wetland	Moderate	B, C, D, E, F, I	7
Proposed native scrub (new and enhanced)	Mixed scrub	Scrub	Moderate	A, B, C, D	10
Proposed water storage area (NBBMA)	Ponds (non-priority habitat)	Pond	Moderate	A, B C, F, G, H, I or A, C, F, G, H, I	3
Proposed scrape					
Proposed ponds					

[4] 'Retained neutral grassland/grazing within solar array security fence line (and elsewhere within the SADA); Other neutral grassland' comprises areas which have been identified as other neutral grassland during baseline surveys, and will be retained as such during the construction and operation of the Proposed Development.
[5] 'Retained neutral grassland/grazing within solar array security fence line (and elsewhere within the SADA): Modified grassland' comprises areas where grassland would be created within the SADA during habitat creation.

Landscape Habitat Type	BNG Habitat Type	Condition Sheet	Target Condition	Targeted Criteria	Time to Target Condition (Years)
Proposed native hedgerow	Native hedgerow (species rich)	Hedgerow	Moderate	A1, A2, B1, B2, C2, D1, D2	5
Proposed native hedgerow (maintained at a low height)	Native hedgerow (species rich)	Hedgerow	Poor	B1, B2, C2, D1, D2	5
Proposed native trees and shrubs	Native hedgerow with trees (species rich)	Hedgerow	Poor	A1, A2, C2, D1, D2, E2	10
Proposed ditch	Ditches	Ditch	Poor	N/A – poor condition targeted	1
Existing drainage ditch (NBBMA) (enhanced)	Ditches	Ditch	Moderate	A, B, C, D, E, F, G	n/a

4.6 The Landscape and Ecological Proposals

4.6.1 To achieve the Project Design Principles, and having regard to the Biodiversity Net Gain objectives, the landscape and ecological proposals would include the following habitat creation/enhancement and access enhancement measures. All measurements stated are approximate:

i) Approximately 36.1 ha of public access/biodiversity enhancement zones, as shown on the **IEM** (**Appendix A**), comprising enhancement of existing vegetation (trees and scrub, grassland and wetland) and provision of new vegetation.
ii) Creation/enhancement of approximately 132 ha of other neutral grassland.
iii) Creation of approximately 75.7 ha of modified grassland.
iv) Specific habitat creation and enhancement measures within Items i-iii above including:
    a) Approximately 2.2 ha of new native woodland.
    b) Approximately 0.87 ha of new native mixed scrub, and enhanced management of approximately 1.43 ha of existing scrub.
    c) Enhancement of approximately 6.4km of existing hedgerows and hedgerow with trees.
    d) Approximately 2.5km of new native hedgerow, and approximately 5km of new belts of native trees and shrubs.
    e) Approximately 1 ha of new ponds, approximately 335m of new ditches, and approximately 2.1 ha of new reedbed. Enhanced management of approximately 0.9 ha of existing ponds, approximately 10.9km of existing ditches and approximately 12.1 ha of existing reedbed.
v) NBBMA including:
    a) Approximately 53.51 ha suitable for new and enhanced habitats (wetland and other neutral grassland) to benefit wetland birds.
    b) Approximately 13.19 ha of additional grassland habitat.

vi) Skylark Mitigation Area, comprising 5.58 ha of other neutral grassland creation, which will support invertebrate prey, offering a foraging resource and which can also be used by nesting skylark through the breeding season, as well as providing wider ecological benefits.

vii) New habitat creation structures, including:

a) 60 no. new bat boxes including a minimum 5 no hibernation boxes and a minimum 5 no. maternity boxes.
b) A minimum 2 no. barn owl boxes.
c) A minimum 2 no. kestrel boxes.
d) A minimum 30 no. bird nesting boxes.
e) 10 no. reptile/amphibian refugia.
f) 20 no. hedgehog boxes.
g) 10. no. insect hotels.

viii)Enhanced access provision including:

a) Enhancements to the existing PRoW network.
b) Approximately 5.34km of new permissive paths.
c) New signage.
d) New interpretation material.
e) New benches
f) New litter bins and dog bins
g) New visitor car park (subject to the process set out in **Section 6.0** below).
h) New bicycle parking.

4.6.2 The amount of new habitat types provided would exceed any loss of the equivalent habitat type due to the construction of the Proposed Development. The management and maintenance measures set out in this **oLEMP** would ensure that ecological function of the new/enhanced habitats exceeds that of any lost due to construction.

4.6.3 Additionally, the Applicant proposes to reach out to local interest groups and nearby educational institutions, with the intention that the habitat creation and enhancement works will be available for research and educational purposes,

thereby providing added value from the Proposed Development to the local community.

5.0 ROLES AND RESPONSIBILITIES

5.1 Introduction

5.1.1 Specific roles and responsibilities during construction are set out indicatively in the **oCEMP [EN010153/DR/7.5]**. Key construction roles and responsibilities relevant to the final LEMP are anticipated to include:

i) **Principal Contractor** – This is a formal role established in the CDM Regulations (2015)[6]. The Principal Contractor will be appointed by the Applicant and have responsibility for co-ordinating the Construction Phase of the project.

ii) **Site Manager** – The Principal Contractor will identify a Site Manager who will have overall responsibility for implementation of the CEMP and all other DCO and legislative requirements.

iii) **Environmental Manager** – The Principal Contractor will identify an Environmental Manager who will have responsibility for management of environmental matters related to the Construction Phase of the Proposed Development, including ensuring compliance with legislation, ensuring that mitigation, management and monitoring measures are implemented, and that best practice is applied during works. The Environmental Manager will be a point of contact with environmental bodies and other third parties as required to perform their duties.

iv) **Environmental Clerk of Works** – The Applicant will appoint an Environmental Clerk of Works (ECoW) who will be a suitably qualified environmental professional responsible for on-site management and monitoring of environmental impacts including for soil management, pollution control, noise and dust monitoring, and surface water.

v) **Ecological Clerk of Works** – The Applicant will appoint an Ecological Clerk of Works (EcoCoW) who will be a suitably qualified ecologist

[6] HMSO (2015). *The Construction (Design and Management) Regulations 2015.* Available at: https://www.legislation.gov.uk/uksi/2015/51 [Last Accessed: 26 February 2025]

responsible for on-site managing and monitoring of the works in relation to habitats, protected species, and other wildlife.

vi) **Community Liaison Officer** – The Applicant will appoint a Community Liaison Officer who will ensure that a Community Liaison Group (CLG) is established and will be the point of contact for the CLG, ensuring that regular updates are issued during the construction of the Proposed Development.

5.1.2 Specific roles and responsibilities once the Proposed Development is operational are set out indicatively in the **oOEMP** and are not repeated in detail here. Key roles and responsibilities relevant to the final LEMP are anticipated to include:

i) **Site Manager** – The Applicant will appoint a Site Manager who will have overall responsibility for implementation of the final LEMP and all other DCO and legislative requirements.

ii) **Environmental Manager** – The Applicant will appoint an Environmental Manager who will have responsibility for management of environmental matters related to the operational phase of the Proposed Development, including ensuring compliance with legislation, ensuring that mitigation, management and monitoring measures are implemented, and that best practice is applied during works. The Environmental Manager will be a point of contact with environmental bodies and other third parties as required to perform their duties.

iii) **Quality Manager** – The Applicant will appoint a Quality Manager who will have responsibility for quality assurance and compliance, document management and record keeping, inspections for quality control, management of risks, and process improvement related to quality control and assurance. For the final LEMP they will have responsibility for quality assurance of procedures and for management of documentation, records, and monitoring of the systems relating to the same

iv) **Ecological Clerk of Works** – The Applicant will appoint an Ecological Clerk of Works who will be a point of contact for the Applicant to discuss

any issues relevant to ecology, if they were to arise during the management of the operational phase i.e. regarding protected species and habitats.

v) **Community Liaison Officer** – The Applicant will appoint a Community Liaison Officer who would be the point of contact, ensuring that regular updates are issued during the operational life of the Proposed Development.

5.1.3 It is envisaged that the NBBMA would be managed separately by an independent conservation organisation or suitably qualified personnel reporting into the Site Manager. Details of this would be provided in the final NBBMS (see **Appendix B** for the outline NBBMS).

6.0 MANAGEMENT AND MAINTENANCE

6.1 Introduction

6.1.1 This section identifies the management and maintenance works required in order to successfully achieve the Project Design Principles that relate to landscape, ornithology and ecology.

6.1.2 Land within the Frodsham National Grid Substation (which also includes the SPEN Substation) and along the route of the Main Access Road would be handed back post-construction. Management and maintenance of those area would thus be the responsibility of the current landowners (or any successor) and falls outside the scope of the final LEMP.

6.1.3 It is envisaged that the NBBMA will be managed separately by an independent conservation organisation or suitably qualified personnel. Details of the management of the NBBMA are set out in **Appendix B** of this document.

6.2 Advanced Works

6.2.1 Timescales for new planting and new seeding are set out in **Section 6.6** and **Section 6.7** below, and implementation will typically follow the substantial completion of the Proposed Development or agreed phases thereof.

6.2.2 However, advanced planting and other works will be undertaken prior to the start of construction in some locations. These works will comprise the following:

i) Planting of new woodland along the south-eastern perimeter of the SADA at the boundary with the M56 corridor, to provide mitigation against glint and glare effects.
ii) Planting of new hedgerows along the southern boundary of the SADA.
iii) Creation of the NBBMA (refer to **Appendix B**).
iv) Implementation of the proposed bird screening measures (see Section 6.11).

6.2.3 An Arboricultural Method Statement (AMS) will be prepared detailing the requirement for protective fencing, tree pruning, signage, timings, methods of works and any other protection measures prior to any vegetation clearance being undertaken.

6.3 Security

6.3.1 Security measures will be addressed as part of the detailed design phase and will be set out in the final OEMP as appropriate. These would include:

i) Measures to prevent access to PRoWs and permissive paths by unauthorised motor vehicles.
ii) Measures to prevent other unauthorised access.
iii) Measures to reduce anti-social behaviour.
iv) Measures required to ensure that security infrastructure (e.g. fencing, CCTV, etc) can be adequately maintained, and that this is not impeded by landscape and ecological management/maintenance.

6.3.2 Measures to prevent unauthorised access, such as to exclude motorcycles from routes will also need to retain access for the intended user groups, i.e. for example these should not prevent access by less mobile pedestrians, and thus will need to reflect what can reasonably be achieved in order to do this.

6.3.3 If use of any of the proposed permissive paths leads to persistent anti-social behaviour or security issues that cannot be otherwise managed (for instance, if a permissive path is misused in a way that threatens wildlife in the NBBMA or the security of the solar farm), then permissive access may be reviewed and potentially removed in the interest of safety and conservation. Any such decision would involve consultation and agreement with CWaCC.

6.4 Climate Change

6.4.1 Given the 40-year operational lifespan of the Proposed Development, it is possible that changes to the climate may affect the management of the works, necessitating changes to what is proposed.

6.4.2 The species mixes that will be specified in the final LEMP (which are outlined in **Section 6.6** and **Section 6.7**) will be stress tested against UKCP18 projections. Good practice guidance published by the Forestry Commission[7] recommends that in relation to specifying native tree species (including shrubs and hedgerow species) that local provenance stock should be supplemented with stock originating between 2 degrees and 5 degrees further south at a similar altitude and distance from the Atlantic Ocean.

6.4.3 Regular monitoring will be undertaken as set out in **Section 7.0**, which will identify the need for changes to management and maintenance, and the implementation of any remedial measures required to address potential adverse effects arising from climate change. This may include the substitution of species where high rates of climate-related failure have occurred, with more resilient alternative species.

[7] Forestry Commission, 2020. *Managing England's woodlands in a climate emergency.*

6.5 General Management

6.5.1 The tasks set out below will be carried out across the Order Limits for the operational life of the Proposed Development, or as otherwise required.

Fencing

6.5.2 Fencing shall be installed as specified in the **oCEMP [EN010153/DR/7.5]** and/or **oOEMP [EN010153/DR/7.6]** and subject to details approved by CWaCC. Additionally, in areas where grassland management by grazing is proposed, stock-proof fencing shall be installed around all existing hedgerows within these areas (and this would need to enclose the extents of the 6m buffers described in Section 4.4).

6.5.3 Suitably sized (approximately 20 cm x 25 cm) gaps or mammal gates would be installed at suitable intervals and locations along the perimeter fence line to allow small mammals, including badgers, free movement into and out of the SADA. Gaps should be in positions close to existing mammal pathways and habitat features providing connectivity within the landscape (e.g., hedgerows). The locations of the gaps/gates would be determined during a pre-commencement survey; this approach would allow for any changes in populations, sett locations and mammal paths which may change prior to the commencement of construction to be taken into account.

6.5.4 Gaps or mammal gates will not be installed along the perimeter fence of the NBBMA, to prevent predatory terrestrial mammal species entering the NBBMA and potentially predating roosting, foraging and/or nesting birds (or eggs/chicks).

6.5.5 All fencing, including any gates, stiles or other associated structures shall be maintained in good condition throughout the life of the Proposed Development.

Litter

6.5.6 Litter and debris shall be removed as required as part of each regular maintenance visit, including from ditches/waterbodies.

Weeding

6.5.7 Problem perennial weeds will be controlled by hand pulling, or if necessary careful targeted application of a non-residual herbicide via spot spraying with a knapsack (low pressure to avoid spray drift) or weed wiping. Herbicide application may be used in April, June and August. Species to be removed shall be identified on-site as part of regular monitoring.

6.5.8 Within or adjacent to ponds, wetland areas, watercourses and ditches, weed growth shall be controlled by either cutting, or by hand pulling. Use of herbicide is not permitted within 10m of watercourses, ditches, ponds, or wetland areas.

6.5.9 If invasive non-native species listed under Schedule 9 of The Wildlife & Countryside Act 1981 (as amended) or the EU Invasive Alien Species Regulation (1143/2014) are encountered within or immediately surrounding the Order Limits at any time, the advice of a suitably qualified ecologist will be sought, and the appropriate best practice measures for the species in question shall be taken to prevent the establishment and spread of such plants around the Order Limits.

6.5.10 Where required, a suitably experienced specialist management company will be instructed to eradicate the invasive non-native species from the Site. Any arisings will be disposed of offsite to a suitably licenced waste disposal facility.

6.5.11 As set out in the outline NBBMS (**Appendix B** to this document), New Zealand Pygmyweed is known to be present in the ponds to the north of dredging Cell 3. As such, a New Zealand Pygmyweed Control and Management Strategy will be produced prior to the commencement of work in this area as specified in the **oCEMP [EN010153/DR/7.5].**

6.5.12 The **oOEMP [EN010153/DR/7.6]** requires that an Invasive Non-Native Species Management Plan (INNSMP) which will be required to set out monitoring and control measures for invasive species, including New Zealand Pygmyweed.

Badgers

6.5.13 The Proposed Development has been designed to avoid impacting habitats most likely to be used by badgers for both sett building and foraging and commuting (field boundary features). These habitats will be largely retained and protected during the construction process as outlined in the **oCEMP [EN010153/DR/7.5]** with further detail to be provided as necessary in the final CEMP.

6.5.14 Specifically, a pre-construction badger survey would be undertaken immediately prior to the commencement of the site clearance works. If this identifies any changes to baseline conditions in respect of the presence of badger activity and/or setts, then design changes may need to be made, and a disturbance/mitigation licence would need to be obtained from NE. Any outcomes that remain relevant post-construction and that might affect the management/maintenance of the landscape and ecological proposals would be reflected in an updated LEMP.

Access

Access Routes

6.5.15 The locations of PRoWs within the Order Limits are illustrated on **ES Vol 3 Figure 1-5: Public Rights of Way [EN010153/DR/6.3].** Those within and proximate to the SADA and NBBMA are also illustrated on the **IEM** (**Appendix A**). Details of the management of each PRoW are set out in the **Outline Public Rights of Way Management Plan [EN010153/DR/7.9]**.

6.5.16 **Figure 1** illustrates the proposed indicative hierarchy of routes within and proximate to the SADA and NBBMA, distinguishing between the types of access and intended user groups for each route.

6.5.17 The locations of proposed permissive paths are illustrated on the **IEM** (**Appendix A**), and are as follows:

i) A: Approximately 845m length of path linking Brook Furlong and Moorditch Lane.
ii) B: Approximately 1.77km length of path running along the River Weaver, linking the terminus of the public byway at Frodsham Marsh farm with Brook Furlong and with public footpath Frodsham FP 81.
iii) C: Approximately 750m length of path linking restricted byway Frodsham RB 99 with public footpath Frodsham FP81.
iv) D: Approximately 255m length of path linking Moorditch Lane and Brook Furlong.
v) E: Approximately 805m length of path linking Brook Furlong and public footpath Frodsham FP81.
vi) F: Approximately 710m length of path linking public footpath Frodsham FP81 and public footpath Frodsham FP93.
vii) G: Between approximately 150m and 225m of path on boardwalks within the wetland habitat areas to be created at Marsh Farm.

6.5.18 Permissive paths will be designed with regard to good practice design guidance including:

i) *Access for all design guide*[8].
ii) *Outdoor Access Design Guide*[9].
iii) *Paths for Everyone*[10].

[8] Environmental Agency, 2013. *Access for all design guide*.
[9] Paths for All and Scottish Natural Heritage, 2016. *Outdoor Access Design Guide*.
[10] Sustrans, 2018. *Paths for Everyone*.

iv) *Outdoor Accessibility Guidance*[11].

6.5.19 Permissive paths A, B, D and F will be maintained for pedestrian access only and will comprise a corridor up to 2m wide. Surfacing would comprise either close-mown grass, gravel or boardwalks, to suit the conditions along specific sections of each route.

6.5.20 Permissive paths C and E will be maintained for cycle and equestrian access (in addition to pedestrian access) and will comprise a corridor up to 3m wide. A gravel surface will be provided which will be suitable for all intended users.

6.5.21 Within the wetland habitat areas to be created to the east of Marsh Farm, timber boardwalks carrying permissive path G will run into the wetland from the adjacent public right of way. The boardwalks shall be of sufficient width to allow two people to pass safely.

6.5.22 Full details of the permissive paths will be set out in the final LEMP, and will be agreed with CWaCC.

6.5.23 All public rights of way and permissive paths within the Order Limits would be kept free from obstruction, save where required to be crossed for maintenance, which may require temporary obstructions/closures. Any temporary closures or diversions to public rights of way must be agreed with CWaCC.

Car Park

6.5.24 The potential visitor car park on Moorditch Lane will only be provided should the proposed access enhancements result in a demonstrable increase in cars informally parking along Moorditch Lane, and if this causes access/egress issues for other users of Moorditch Lane. Its provision will be agreed with CWaCC. The Applicant commits to addressing any unforeseen access/egress

[11] Paths for All and Sensory Trust, 2023. *Outdoor Accessibility Guidance*.

issues on Moorditch Lane that are caused by the Proposed Development, either by constructing the car park or via alternative measures. If delivered, the car park will include security features (e.g. height-restricting barriers and a lockable gate), and the Applicant reserves the right to remove the car park later, if it gives rise to persistent anti-social behaviour. Suitable evidence of such behaviour would first be presented to CWaCC and potential solutions discussed. The proposed location of the potential car park is indicated on the **IEM** (**Appendix A**).

6.5.25 Details of the potential car park, including security measures would be set out in the final LEMP.

Bicycle Parking

6.5.26 Bicycle parking facilities would be provided at strategic locations within the Order Limits, including at the point where permissive path A meets Moorditch Lane, and at the proposed car park described above. Indicative locations are shown on the **IEM** (**Appendix A**).

6.5.27 Details of these would be set out in the final LEMP.

Street Furniture

6.5.28 Interpretation panels will be provided within the Order Limits at the locations shown indicatively on the **IEM** (**Appendix A**). These will provide content providing information on subjects including local biodiversity, cultural heritage assets, renewable energy generation and climate change. Full details of the interpretation panels, including location, content and specification will be set out in the final LEMP.

6.5.29 Signage will comprise waymarking signs mounted on timber posts (or attached to fenceposts) located at each route intersection. The purposes of signage will be to indicate the direction that each route follows, and to provide any other information pertinent to the health and safety of users. In particular, the need for dogs to be kept on leashes along routes close to the NBBMA and

to the River Weaver would be shown on signage. Full details of signage, including location and specification will be set out in the final LEMP.

6.5.30 All signage and interpretation material will be maintained in good condition, so that the information that they show is unobscured and easy to read. Any damage will be made good as soon as feasible.

6.5.31 Benches/seating will be provided at strategic locations along the routes, including at points where opportunities for birdwatching are available. Details of these, including locations will be set out in the final LEMP.

6.5.32 Litter bins/dog bins will be provided along the routes, subject to agreeing a suitable refuse collection strategy with CWaCC. Details and locations will be set out in the final LEMP.

Utilities

6.5.33 The implementation and management of all landscape and ecological proposals shall have regard to the presence of underground and overhead utilities, reflecting the easements set out in **Section 4.4**, and shall not interfere with the operation and maintenance of these.

Pollution Control

6.5.34 Vehicular access to the Proposed Development will be controlled as described above and will be limited to maintenance activities. Pollution prevention measures for vehicles and machinery are set out in the oCEMP, oOEMP and oDEMP. Access tracks will be inspected as part of regular monitoring activities (see **Section 7.0**) to ensure no unacceptable erosion is occurring, and remedial action would be taken where appropriate.

6.6 Existing Trees and Shrubs, and Proposed Planting

Planting Specification

Native Woodland

6.6.1 The following indicative species mix is proposed for areas of new native woodland, with full details to be confirmed in the final LEMP.

i)	Oak (*Quercus robur*)	35%.
ii)	Silver Birch (*Betula pendula*)	15%.
iii)	Field Maple (*Acer campestre*)	20%.
iv)	Holly (*Ilex aquifolium*)	10%.
v)	Hazel (*Corylus avellana*)	10%.
vi)	Hawthorn (*Crataegus monogyna*)	10%.

6.6.2 All plants are to be of certified local provenance (seed zone 302), subject to availability. Stock from seed zones 303, 305, and 404 is also considered suitable and inclusion is encouraged to add resilience against potential adverse climate-change related effects (see **Section 6.4**).

6.6.3 Planting density to be 2m centres. Stock will be predominantly bare root transplants (typically either 40-60cm 1+1 transplants, or 60-80cm 1+2 transplants). Holly will be container grown (typically either 40-60cm 2L pot, or 60-80cm 3L pot). Larger stock may be planted within the woodland plots at lower densities (typically feathered trees c. 2m high) where early screening is required.

Native Scrub

6.6.4 The following indicative species mix is proposed for areas of new native scrub, with full details to be confirmed in the final LEMP.

i)	Hazel (*Corylus avellana*)	30%.
ii)	Hawthorn (*Crataegus monogyna*)	45%.
iii)	Blackthorn (*Prunus spinosa*)	25%.

6.6.5 All plants are to be of certified local provenance (seed zone 302), subject to availability. Stock from seed zones 303, 305, and 404 is also considered suitable and inclusion is encouraged to add resilience against potential adverse climate-change related effects (see **Section 6.4**).

6.6.6 Planting density to be 2m centres. Stock will be bare root transplants (typically either 40-60cm 1+1 transplants, or 60-80cm 1+2 transplants).

6.6.7 Mixed scrub will be planted to ensure that at least three woody species are planted in any one stand of scrub, and that no single species consists more than 75% of the mix.

Native Tree and Shrub Belts

6.6.8 The following indicative species mix is proposed for new native tree and shrub belts, with full details to be confirmed in the final LEMP.

i)	Oak (*Quercus robur*)	20%.
ii)	Silver Birch (*Betula pendula*)	20%.
iii)	Field Maple (*Acer campestre*)	22.5%.
iv)	Hazel (*Corylus avellana*)	10%.
v)	Hawthorn (*Crataegus monogyna*)	12.5%.
vi)	Dog Rose (*Rosa canina*)	7.5%
vii)	Blackthorn (*Prunus spinosa*)	7.5%

6.6.9 All plants are to be of certified local provenance (seed zone 302), subject to availability. Stock from seed zones 303, 305, and 404 is also considered suitable and inclusion is encouraged to add resilience against potential adverse climate-change related effects (see **Section 6.4).**

6.6.10 Planting density to be 2m centres. A minimum of five different species will be planted per 30m length. Areas of less dense planting/gaps are to be identified on-site, in order to retain long-range views.

6.6.11 Stock will be predominantly bare root transplants (typically either 40-60cm 1+1 transplants, or 60-80cm 1+2 transplants). Larger stock may be planted at lower densities (typically feathered trees c. 2m high) where early screening is required.

Native Hedgerows

6.6.12 The following indicative species mix is proposed for new native hedgerows , with full details be confirmed in the final LEMP.

i)	Field Maple (*Acer campestre*)	15%.
ii)	Dog Rose (*Rosa canina*)	15%.
iii)	Hawthorn (*Crataegus monogyna*)	35%.
iv)	Blackthorn (*Prunus spinosa*)	25%.
v)	Holly (*Ilex aquifolium*)	10%.

6.6.13 All plants are to be of certified local provenance (seed zone 302), subject to availability. Stock from seed zones 303, 305, and 404 is also considered suitable and inclusion is encouraged to add resilience against potential adverse climate-change related effects (see **Section 6.4**).

6.6.14 Plant in double staggered rows, 5 plants per linear metre. All five proposed species will be planted within each 30m length of hedgerow.

6.6.15 Stock will be predominantly bare root transplants (typically either 40-60cm 1+1 transplants, or 60-80cm 1+2 transplants). Holly will be container grown (typically either 40-60cm 2L pot, or 60-80cm 3L pot). Larger stock may be planted within the hedgerows at lower densities (typically feathered trees c. 2m high) where early screening is required.

Implementation

6.6.16 Planting will be carried out in the first available season following the substantial completion of the Proposed Development; earlier planting will be carried out, as and where possible, subject to the completion of any ground

works (including land associated with temporary laydown) required in the location of specific planting or seeding works.

6.6.17 Bare root and rootballed stock will be planted while dormant (between the months of November and February, inclusive). Containerised stock will be used where necessary, as advised by the supplier.

6.6.18 Transplants and holly will be notch planted. Feathered stock will be pit planted, with pit details to be set out in the final LEMP.

6.6.19 It is expected that ground conditions and climate will allow for earlier planting (i.e. before January), this will allow the plants more time to establish a network of feeder roots before the onset of spring. Earlier planting will be carried out where possible.

6.6.20 Planting of trees and shrubs will not be carried out when the ground is wet/waterlogged or frost bound, or during periods of excessive cold drying winds or drought.

6.6.21 In areas of existing dense bramble scrub, these will be cleared of bramble prior to planting with the proposed native scrub species.

6.6.22 On completion, all plants will be thoroughly watered-in and will be protected from damage by individual spirals/guards, supported by a high-quality stake that suits the height of the tube. Where there is risk of damage from livestock, stock-proof fencing may also be installed (and this would need to enclose the 6m buffer described in **Section 4.4**).

6.6.23 After planting a 50mm layer of compost fine bark mulch (nominal size 1-10mm) will be spread to 1m wide diameter around the stem of each plant.

Establishment Management

General

6.6.24 The establishment management period for new planting will last for the first five years following practical completion of the landscape works.

6.6.25 All canes, stakes, guards, spirals and ties, and any stock-proof fencing will be regularly checked, replaced as required and removed from Site and disposed of once plants have established. This is to be checked annually.

6.6.26 Bark mulch will be topped up annually or as required, to maintain 50mm deep layer, until the plants have established.

6.6.27 During the establishment management period (the first 5 years), all dead, dying or diseased stock will be replaced with stock of similar size and species by the appointed contractor at their own cost. If the failure of the plant is due to disease and the disease is considered likely to re-occur, then an alternative native species of local provenance may be used as a replacement, to be agreed with CWaCC. The exact timing of the planting of replacement scrub/tree is dependent on the ground conditions; however, planting will take place between the months of November and February, inclusive.

6.6.28 An annual inspection will be undertaken each September to identify stock in need of replacement.

Weeding and Litter

6.6.29 The planting areas (1m radius around each stem) will be kept mulched to the original specification and weed-free during the establishment period, using approved hand-weeding or if necessary, herbicide treatment (applications in April, June and August). The herbicide handbook (English Nature, 2003) provides guidance on appropriate herbicide use in relation to nature conservation works. Where used, herbicides will be sprayed in appropriate weather conditions (i.e. during periods of low wind and no excessive rainfall) in accordance with the supplier's instructions, to avoid affecting adjacent grassland areas and will not be used within 10m of watercourses, ditches, ponds, or wetland areas.

6.6.30 The bases of all hedgerows are to be kept weed-free. Manual removal of weeds should be undertaken in the first instance, if this is not successful a minimum of 3 no. applications of systematic herbicide per growing season

should be actioned, with a combination of visits to manually remove weeds in conjunction with the use of herbicide, during the first 3 years. Where a hedgerow is within 10m of a watercourse, ditch, pond or wetland, weed removal shall be carried out manually.

6.6.31 Any litter accumulated around hedgerow bases is to be cleared at the same time as weed control operations.

6.6.32 All plants will remain upright and canes/guards adjusted as necessary during treatment of weeds.

Watering and Fertiliser

6.6.33 During the establishment period, trees and shrubs will be inspected during periods of warm weather and drought. If it is considered that the ground conditions are too dry, the planted areas will be watered on a regular basis until weather conditions are considered suitable for watering to cease. Plants shall receive an application of slow-release fertiliser for the first 3 years.

6.6.34 All hedgerow lines shall be regularly watered in times of drought to field capacity and shall receive an application of slow-release fertiliser for the first 3 years.

Long-term Management

General

6.6.35 Long-term management prescriptions will apply once establishment is complete. Existing trees, shrubs and hedgerows will be subject to long-term management from practical completion of the landscape works. Any new planting required to enhance existing vegetation shall be specified and implemented as set out above.

6.6.36 All guards and stakes shall be removed from plants once they are no longer required. These shall be disposed of off-site. Biodegradable guards may be left on-site.

6.6.37 As set out above, in areas where grassland management by grazing is proposed, stock-proof fencing will be required around all existing hedgerows within these areas (and this would need to enclose the extents of the 6m buffers described in **Section 4.4**). This will need to be maintained for the operational life of the Proposed Development.

6.6.38 No cutting or trimming of trees, shrubs or hedgerows will be undertaken during the bird breeding season (01 March to 31 August, inclusive) unless under the supervision of an appropriately qualified ecologist to ensure compliance with wildlife legislation.

6.6.39 Prior to the removal or trimming of any established trees, suitable checks for roosting bats will be undertaken in advance of any removal in accordance with guidance applicable at the time. If bats are confirmed to be roosting within any tree suspected to be impacted by the proposed works, the data gathered would be used to inform potential design amendments in order to avoid or reduce impacts, or failing that, support a European Protected Species (EPS) mitigation licence application to NE to destroy/disturb the bat roost.

6.6.40 Management will ensure that trees and shrubs do not present a hazard to human health, to the operation of the Proposed Development, or to utilities. Where hazards are identified, remedial measures will be taken.

6.6.41 Any arisings from management, e.g. cuttings from thinning/coppicing or from hedge trimming, may be left in piles (typically around the edges of woodland areas), in order to provide additional habitat for invertebrates, amphibians and reptiles and small mammals (if present). Arisings left in piles should only be removed from Site for essential reasons such as to retain access to infrastructure

Woodland

6.6.42 Following the initial establishment maintenance period, the woodland planting areas will be managed to enable the development of a diverse structure in the longer-term. Management shall be on a minimum intervention basis.

6.6.43 Selective thinning of weaker specimens, and/or coppicing of selected species will be undertaken with the aim being to diversify the structure of woodland. The need for thinning and coppicing will be determined every five years by the Environmental Manager, commencing in the first year of the final LEMP. The Update Report will record the species coppiced, and the timescales of the coppicing regime proposed.

6.6.44 Key management objectives for woodland are as follows:

i) Provide visual screening of glint and glare impacts.
ii) Meets the UKHab definition of Other Broadleaved Woodland.
iii) Greater than 80% of species are broadleaved.
iv) Natural regeneration occurs.
v) At least four native tree or shrub species are present.
vi) Woodland is developing a complex structure including ground flora, understory, shrub and canopy species.

Scrub

6.6.45 Scrub will not be allowed to develop into large/dense areas of woodland, and remedial action shall be taken to prevent this, as necessary.

6.6.46 Key management objectives for scrub are as follows:

i) Achieves UKHab definition of Mixed Scrub.
ii) At least three native woody species.
iii) Ensure no single species consists greater than 75% of the habitat.
iv) Promote natural regrowth.
v) Ensure complementary edge habitat is present.

Native Trees and Shrubs

6.6.47 Belts of trees and shrubs will be left to grow. Management will ensure that any gaps in these belts that are intended to allow longer views across the Order Limits are retained.

6.6.48 Key management objectives for trees and shrubs (classified as hedgerows with trees within the Metric) are as follows:

i) Provide screening of views of the proposed new structures, but retain strategic gaps/less dense/lower sections where necessary to preserve existing long-range views towards the Mersey Estuary or to Frodsham Hill and Helsby Hill.
ii) Achieves UKHab definition of Native Species Rich Hedgerow
iii) Maintain a minimum of five woody species per 30m length.
iv) Maintain a bushy growth, on average, of at least 1.5m height and width.
v) Avoid damage from human activities.
vi) Maintain trees in a healthy condition.

Hedgerows

6.6.49 Existing and established hedgerows will be left to grow with minimal selective thinning and then maintained at a height of approximately 3m. Typically, hedgerows will be maintained to a minimum width 1.5m and where space allows hedgerows will be allowed to grow out sideways to a maximum width of 3m.

6.6.50 Typically, hedgerows will be cut on a 3-year rotational basis, i.e. not all hedgerows cut in the same year. A third of the total of hedgerows will be cut each year, but the length cut will not be one long stretch, but will be distributed across smaller sections of each hedgerow. This will maintain a resource of flowering and fruiting plants and create nesting and foraging habitat for wildlife. Any existing trees located within hedgerows will be left to grow naturally and not cut. These will be clearly marked to ensure that they are not cut back during hedgerow trimming/maintenance works.

6.6.51 Where the **IEM** (**Appendix A** of this document) shows that proposed hedgerows will be 'maintained at a lower height' these will be cut to maintain a maximum height of no more than 1.5m in order to retain views over these

from the adjacent public rights of way and permissive paths. These will be cut annually to maintain the intended height.

6.6.52 Hedgerows alongside all access routes (whether for maintenance access or for recreation/amenity) will receive an additional annual cut on the side facing the routeway where necessary, to ensure they will not encroach or impede access.

6.6.53 Hedgerows will be cut between late September and February, and no cutting or trimming is to be undertaken during the bird breeding season (01 March to 31 August inclusive) unless supervised by a suitably qualified ecologist.

6.6.54 Key management objectives for hedgerows are as follows:

i) Provide screening of views of the proposed new structures, but retain strategic gaps/lower sections where necessary to preserve existing long-range views towards the Mersey Estuary or to Frodsham Hill and Helsby Hill
ii) Achieves UKHab definition of Native Species Rich Hedgerow.
iii) Maintain a minimum of five woody species per 30m length.
iv) Maintain a bushy growth of at least 1.5m height and width (excluding the lengths to be maintained at a low height).
v) Lengths to be maintained at a low height to have a maximum height of 1.5m, to allow views over them.
vi) Avoid vertical ('leggy') and horizontal gaps along the length of the hedgerow.
vii) Maintain species diverse margins of at least 1m.
viii) Avoid damage from human activities.

6.7 Existing and Proposed Grassland

Seeding Specification

Other Neutral Grassland

6.7.1 The following indicative species mix is proposed for other neutral grassland, with full details to be confirmed in the final LEMP.

6.7.2 Where other neutral grassland is to be created via new seeding, these areas will be sown with Emorsgate EM2 Standard General Purpose Meadow Mixture or similar (indicative species mix set out below) at a rate of 4g/m^2. Seeding will be carried out in accordance with the supplier's instructions.

Grasses

i)	Common Bent (*Agrostis capillaris*)	8.5%.
ii)	Crested Dogstail (*Cynosurus cristatus*)	29.75%
iii)	Red-fescue (*Festuca rubra*)	25.5%
iv)	Smaller Cat's-tail (*Phleum bertolonii*)	4.25%
v)	Smooth-stalked Meadow-Grass (*Poa pratensis*)	17%

Herbs/Wildflowers

i)	Yarrow (*Achillea millefolium*)	0.75%.
ii)	Common Knapweed (*Centurea nigra*)	2.25%.
iii)	Wild Carrot (*Daucus carota*)	1.2%.
iv)	Lady's Bedstraw (*Galium verum*)	0.3%.
v)	Field Scabious (*Knautica arvensis*)	0.6%.
vi)	Oxeye Daisy (*Leucanthemum vulgare*)	1.95%.
vii)	Musk Mallow (*Malva moschata*)	0.75%.
viii)	Ribwort Plantain (*Plantago lanceolata*)	2.25%
ix)	Salad Burnet (*Poterium sanguisorba ssp. sanguisorba*)	1.5%.
x)	Cowslip (*Primula veris*)	0.45%.
xi)	Meadow Buttercup (*Ranunculus acris*)	1.5%.

xii) Yellow Rattle (*Rhinanthus minor*)	0.75%.
xiii)Bladder campion (*Silene vugaris*)	0.75%.

Modified Grassland

6.7.3 The following indicative species mix is proposed for modified grassland, with full details to be confirmed in the final LEMP.

6.7.4 Where modified grassland is to be created via new seeding, these areas will be sown with Emorsgate EG22 Strong Lawn Grass Mixture or similar (indicative species mix set out below) at a rate of 4g/m^2. Seeding will be carried out in accordance with the supplier's instructions.

Grasses

i) Common Bent (*Agrostis capillaris*)	5.0%
ii) Red Fescue (*Festuca rubra*)	39.0%
iii) Perennial Ryegrass (*Lolium perenne*)	25.50%
iv) Smooth-stalked Meadow-grass (*Poa pratensis*)	15.5%

Herbs/Wildflowers

i) Common Knapweed (*Centaurea nigra*)	2.25%
ii) Wild Carrot (*Daucus carota*)	1.75%
iii) Lady's Bedstraw (*Galium verum*)	0.5%
iv) Oxeye Daisy (*Leucantheum vulgare*)	1.25%
v) Musk Mallow (*Malva moschata*)	0.25%
vi) Ribwort Plantain (*Plantago lanceolata*)	2.5%
vii) Salad Burnet (*Poterium sanguisorba ssp sanguisorba*)	2.25%
viii)Self Heal (*Prunalle vulgaris*)	1.75%
ix) Meadow Buttercup (*Ranunculus aris*)	1.75%
x) Red Campion (*Silene dioica*)	0.75%.

Marshy Grassland

6.7.5 The following indicative species mix is proposed for marshy grassland, with full details to be confirmed in the final LEMP.

6.7.6 Where marshy grassland is to be created via new seeding, these areas will be sown with Emorsgate EM8 Meadow Mixture for Wetlands or similar (indicative species mix set out below) at a rate of 4g/m^2. Seeding will be carried out in accordance with the supplier's instructions.

Grasses

i) Common Bent (*Agrostis capillaris*) 4%.
ii) Sweet Vernal-grass (*Anthoxanthum odoratum*) 4%.
iii) Grey sedge (*Carex divulsa subsp. divulsa*) 0.8%.
iv) Crested Dogstail (*Cynosurus cristatus*) 33.6%.
v) Tufted Hair-grass (*Deschampsia cespitosa*) 1.6%.
vi) Red-fescue (*Festuca rubra*) 20%.
vii) Meadow Barley (*Hordeum secalinum*) 3.2%.
viii) Smaller Cat's-tail (*Phleum bertolonii*) 5.6%.
ix) Rough-stalked Meadow-grass (*Poa trivialis*) 5.6%.
x) Tall Fescue (*Schedonorus arundinaceus*) 1.6%.

Herbs/Wildflowers

i) Yarrow (*Achillea millefolium*) 0.7%.
ii) Agrimony (*Agrimonia eupatoria*) 0.6%.
iii) Wild Angelica (*Angelica sylvestris*) 0.1%.
iv) Betony (*Betonica officinalis*) 0.2%.
v) Common Knapweed (*Centurea nigra*) 3.2%.
vi) Meadowsweet (*Filipendula ularia*) 1.4%.
vii) Hedge Bedstraw (*Galium album*) 0.4%.
viii) Lady's Bedstraw (*Galium verum*) 2%.
ix) Meadow Vetchling (*Lathyrus pratensis*) 0.8%.
x) Rough Hawkbit (*Leontodon hispidus*) 0.6%.

xi) Oxeye Daisy (*Leucanthemum vulgare*)	1.2%.
xii) Birdsfoot Trefoil (*Lotus corniculatus*)	0.6%
xiii) Greater Birdsfoot Trefoil (*Lotus pedunculatus*)	0.1%.
xiv) Black Medick (*Medicago lupulina*)	1%.
xv) Ribwort Plantain (*Plantago lanceolata*)	2%.
xvi) Cowslip (*Primula veris*)	0.4%.
xvii) Selfheal (*Prunella vulgaris*)	0.8%.
xviii) Meadow Buttercup (*Ranunculus acris*)	1.2%.
xix) Yellow Rattle (*Rhinanthus minor*)	0.8%.
xx) Common Sorrel (*Rumex acetosa*)	0.6%.
xxi) Great Burnet (*Sanguisorba officinalis*)	0.3%.
xxii) Ragged Robin (*Silene flos-cuculi*)	0.5%.
xxiii) Dandelion (*Taraxacum officinale*)	0.2%.
xxiv) Tufted Vetch (*Vicia cracca*)	0.3%.

Implementation

6.7.7 Grassland seed will be sown in the first September following the substantial completion of the Proposed Development, to allow establishment prior to winter and to provide optimal conditions for Yellow Rattle to establish. Seed will be surface sown, broadcast by machine and rolled where possible. The seed will be divided into two parts for each section and sown in two passes perpendicular to each other where possible.

6.7.8 Seeding will not be carried out when the ground is wet/waterlogged or frost bound, or during periods of excessive cold drying winds or drought.

Establishment Management

6.7.9 The establishment period for new grassland will last for the first year following practical completion of the landscape works.

Other Neutral Grassland and Modified Grassland

6.7.10 Following seeding in autumn, a high spring cut to between 70-100mm will be undertaken around the following April with no further mowing until mid-July. It will then receive a monthly cut, to a height of between 40mm and 60mm, until the end of the growing season to prevent annual weeds from establishing.

6.7.11 Mowing will only take place during periods of dry weather to ensure that waterlogged ground is not damaged by machinery.

6.7.12 The grassland will not be improved by chemical fertiliser or slurry and nutrient levels in the soil should be allowed to reduce over time.

6.7.13 All arisings should remain on Site for 3-5 days following the cut to allow seeds to disperse, and then removed from Site.

Marshy Grassland

6.7.14 In marshy grassland areas, most of the sown meadow species are perennial and are slow to establish. Soon after sowing there is likely to be a flush of annual weeds, arising from the soil seed bank. These weeds can look unsightly, but they will offer shelter to the sown seedlings, provide habitat for invertebrates, and they will die before the year is out. Therefore cutting of the wetland grass will not occur until mid to late summer. Cuttings will be removed.

6.7.15 The grass will then be kept short by mowing through to the end of March of the following year. Any residual perennial weeds such as docks will be manually dug out.

Long-term Management

General

6.7.16 Long-term management prescriptions will apply once establishment is complete. Existing vegetation will be subject to long-term management from practical completion of the landscape works.

Within Solar Array

6.7.17 Grassland within the extent of the Solar Array security fencing (i.e. the areas where the solar PV models are located) will be managed via low-intensity sheep grazing (between September to February) which could be supplemented by mowing via an optional hay cut in August with subsequent aftermath grazing to further reduce fertility.

6.7.18 If grazing is unable to be undertaken during the operation of the solar farm, mechanical cutting will be undertaken instead to replicate the sward height for early March described below.

6.7.19 Moderate trampling will expose ground for colonisation by annuals the next spring; however, heavy trampling can lead to ground poaching and infestations by weed species that will be detrimental to the Site.

6.7.20 The approach outlined in **Table 2** will be followed to allow summer flowering plants to set seed during spring and summer, and to allow low-intensity grazing during winter.

Table 2: Low-Intensity Grazing Annual Regime

Timing	Action
January - February	Light grazing on any new growth.
End of February	Remove grazing; this allows forbs to grow and allows a good habitat for ground nesting birds to develop.
End of August	An optional hay cut may be taken. Cut hay once the wildflowers have seeded from August onwards. The arisings can be collected as a hay crop, mechanically raked and piled up or removed. Arisings must be removed with one or more of these methods to avoid the harmful effects of grass mulch on plant species diversity
September to the end of December	The main grazing period with light grazing down to a short sward height; a mosaic of plant heights helps encourage insects.

6.7.21 The intended outcome of a conservation grazing scheme will be to have a sward of the following height structure at the beginning of March:

i) 75% at a height of approximately 5cm; and

ii) 25% at a height of approximately 25cm.

6.7.22 A stocking density of between 0.5 – 1 livestock units (LSUs) per hectare is recommended between late September and February. This is a typical stocking density for conservation grazing. However, the stocking density and timing of grazing will be at the discretion of the land manager, in order to achieve the desired sward structure given above. More animals could be used for shorter grazing periods.

6.7.23 It is important to regularly monitor the Site to ensure the grassland is not under or over grazed and stock density and duration altered accordingly to deliver the Target Condition specified in Table 1. The stocking density should be reduced in wet periods or in conditions when poaching would lead to a break-up of the sward and colonisation by aggressive weed species.

6.7.24 The following indicators will be used to review and amend stocking densities:

i) An increase in the amount of uneaten grass, the accumulation of litter, an increase in vigorous rank and unpalatable grasses, and a reduction in low growing herbs indicates stocking density is too low (increase density).
ii) A reduction in density of plants, excessive poaching, weed invasion and the development of bare patches indicates stocking density is too high (reduce density).

6.7.25 Grazing is only to be undertaken by sheep. Cattle grazing is not proposed due to the damage this livestock may cause to the solar panel equipment.

6.7.26 Should the sward height become a problem, with plants starting to shade the lower levels of the panels, a strip of no more than 1 m wide can be cut at the base of the panel to shorten the sward height in this area. This cutting can occur at any time, in such cases cuts should reduce sward height to no lower than 200 mm to retain habitat for biodiversity.

Outside Solar Array (excluding NBBMA)

6.7.27 Outside of the Solar Array security fencing and/or stock proof fencing surrounding panel areas, grassland will be managed via mechanical cutting.

6.7.28 Following establishment, one or possibly two cuts will be taken per year comprising an early cut in February (if necessary) to manage regrowth, and a second later in the season between August and September (each cut reducing sward height to approximately 150 mm). No cutting will take place throughout the summer to allow the seeds of the later flowering species to fall prior to the cut. There may be circumstances when an additional summer cut is required to prevent vegetation obscuring panels, in such cases cuts should reduce sward height to no lower than 200 mm to retain habitat for biodiversity.

6.7.29 Cutting should adopt a systematic method (i.e., working outwards towards the boundary features); this will allow fauna such as invertebrates, amphibians, birds and small mammals to temporarily and safely vacate the area.

6.7.30 The management will take a flexible approach and the exact dates will be dependent upon weather conditions. A phased (rotational) cutting regime is recommended (i.e., ideally the entire area should not be cut at the same time) in order to allow for more structured grassland.

6.7.31 Cuttings will remain on-Site for three to five days following the cut to allow seeds to disperse and then be removed or heaped in designated areas within the Solar Array Development Area in order to remove nutrients and promote the development of a botanically diverse sward.

Management Objectives for Grassland

6.7.32 Key management objectives for modified grassland are as follows:

i) Achieves UKHab definition of Modified Grassland.
ii) Ensure at least six species per m^2 on average.
iii) Varied sward height is present.
iv) Scrub accounts for less than 20% of the total grassland area.

v) Cover of bare ground is between 1% and 10%.

6.7.33 Key management objectives for other neutral and marshy grassland (other neutral) are as follows:

i) Achieves UKHab definition of Other Neutral Grassland.
ii) Ensure at least nine species per m^2 on average.
iii) Varied sward height is present.
iv) Scrub accounts for less that 5% of the total grassland area.
v) Cover of bare ground is between 1% and 10%.
vi) Species indicative of nutrient enrichment are not present.

6.8 Wetland (outside the NBBMA)

Planting/Seeding Specification

6.8.1 The following indicative species mix is proposed for wetland, with full details to be confirmed in the final LEMP.

6.8.2 The following species mixes are proposed.

Marginal planting

6.8.3 Grass species. To be seeded around the edges of the new or enhanced ditches and waterbodies.

i)	Common Bent (*Agrostis capillaris)*	11%.
ii)	Marsh Foxtail (*Alopecurus geniculatus*)	11%.
iii)	Meadow Foxtail (*Alopecurus pratensis*)	11%.
iv)	Marsh Marigold (*Caltha palustris*)	2%.
v)	Cuckoo Flower (*Cardamine pratensis*)	3%.
vi)	Greater Tussock Sedge (*Carex paniculata*)	11%.
vii)	Pendulous Sedge (*Carex pendula*)	11%.
viii)	Greater Pond Sedge (*Carex riparia*)	11%.
ix)	Crested Dog's-tail (*Cynosurus cristalus*)	3%.
x)	Red Fescue (*Festuca rubra*)	2%.
xi)	Water Avens (*Geum rivale*)	3%.
xii)	Floating Sweet Grass (*Glyceria fluitans*)	11%.
xiii)	Purple Loosestrife (*Lythrum salicaria*)	2%.
xiv)	Water Mint (*Mentha aquatica*)	3%.
xv)	Water-cress (*Nasturtium officinale*)	2%.
xvi)	Reed Canary Grass (*Phalaris arundinacea*)	3%.

6.8.4 Plant plugs at density 7/m^2 in single species groups of 20-30, around the edges of the ditch/waterbody.

i)	Greater Tussock Sedge (*Carex paniculata*)	10%.

ii) Greater Pond Sedge (*Carex riparia*) 10%.
iii) Floating Sweet Grass (*Glyceria fluitans*) 10%.
iv) Purple Loosestrife (*Lythrum salicaria*) 10%.
v) Reed Canary Grass (*Phalaris arundinacea*) 10%.

In-channel (aquatic) planting

6.8.5 Plant plugs at density 7/m^2 in single species groups of 20-30, within the permanently wet part of the ditch/waterbody.

i) Common Water Plantain (*Alisma plantago-aquatica*) 10%.
ii) Soft Rush (*Juncus effusus*) 10%.
iii) Yellow Flag Iris (*Iris pseudacorus*) 10%.
iv) Branched Bur Reed (*Sparganium erectum*) 10%.
v) Bull Rush (*Typha latifolia*) 10%.

Reedbeds

6.8.6 Common reed (*Phragmites australis*) to be planted in the margins of the new reedbeds at a density of approximately 5 plants per m^2.

Implementation

6.8.7 Details of the physical measures required for the creation or enhancement of existing ponds/open water environments, e.g. the wetland area around Marsh Farm, will be set out in the final CEMP, and relevant details will be carried forward into the final LEMP.

6.8.8 Scrapes will be created by excavating shallow depressions, the depths of which will be set out in the final LEMP. Locations shall be broadly as indicated on the **IEM** (**Appendix A**), with the final locations determined on site.

6.8.9 Wetland seed will be sown between late July to early September, to allow establishment prior to winter and likely winter flooding. Alternatively, it may be sown during spring if there is a risk of flooding during the autumn.

6.8.10 Wetland plug planting will take place March/April or September/October when ground and climate conditions are suitable. Ground should be damp to wet prior to planting and where possible planting will be undertaken during rainy weather. Planting will not be carried out when the ground is frost bound, or during periods of excessive cold drying winds or drought.

Establishment Management

General

6.8.11 The establishment period for wetland vegetation shall last for the first year following practical completion of the landscape works.

6.8.12 Litter and debris will be removed as required, at a minimum on a monthly basis.

6.8.13 Weed growth shall be controlled by either cutting, or by hand pulling. Use of herbicide is not permitted. Species to be removed shall be identified on-site as part of regular monitoring.

6.8.14 No establishment cutting of vegetation is required.

Long-term Management

General

6.8.15 Long-term management prescriptions shall apply once establishment is complete. Existing vegetation shall be subject to long-term management from practical completion of the landscape works.

6.8.16 Management of vegetation shall not impede the drainage function of any wetland feature, including ditches.

Ditches

6.8.17 Once established, bankside vegetation will be cut on a rotational basis, with 25% being cut each year. Areas to be cut shall be cut to 50mm in September with arisings being left for 5-7 days before removal.

6.8.18 Other maintenance actions may be required, such as removal of sediment, which would impact the landscape proposals as grass and plants are likely to be damaged in the process. When this occurs, the affected areas will be re-seeded with the same mix as originally specified, or similar, as available. Additional plug planting will be carried out with the original species and sizes. New planting and seeding will revert to a year of establishment maintenance before being incorporated back into the long-term maintenance operations.

6.8.19 Management shall control the spread of non-native species, which shall typically be removed in the winter following identification. If best practice for the control of particular species requires removal at other times, then this shall be followed.

6.8.20 Vegetation growth shall be encouraged along ditches, as long as this does not prejudice drainage. Where the presence of vegetation is inhibiting drainage, this shall be cleared (all arisings to be removed from the ditch) or other appropriate steps taken to remedy the situation. As a guide no more than approximately 60%-80% of the surface area shall be covered by vegetation at any one-time.

6.8.21 Key maintenance objectives for new and enhanced ditches are as follows:

i) Achieves UKHab definition of Ditch.
ii) Maintaining good water quality, with no obvious signs of pollution or eutrophication.
iii) Range of emergent, submerged and floating plants are present.
iv) Fringe of aquatic marginal vegetation is present.
v) Avoid damage from human activities.
vi) Maintain a summer water depth of at least 50 cm.

6.8.22 Retained ditches will also be enhanced and managed for the benefit of water voles as described below.

6.8.23 Enhancement measures for the benefit of water voles will focus on diversifying the bankside vegetation, and also managing the dense bramble scrub to

maintain a mix of structure and age and reducing any encroachment/shading of scrub on the channel.

6.8.24 Rotational cutting of the existing dense scrub would maintain a range of successional stages and therefore structure, whilst also encouraging the growth of grass and other bankside vegetation, which would provide more varied cover and food sources for water vole.

6.8.25 The following actions may be undertaken (adapted from *Helping Water Voles on Your Land,* People's Trust for Endangered Species)[12].

i) Cut vegetation on a two-year rotation (or longer), leaving one bank uncut each year. Maintain 15cm of vegetation when cutting and leave gaps of 10-20m as untouched refuge areas. Vegetation to be cut in late Summer (September).
ii) Where ditches have filled in or overgrown, de-silt ditches on a five-year rotation. Carry out work between mid-September and late January. Avoid de-silting more than half a ditch in any winter, and avoid scraping the bank edges as this can destroy burrows. This will encourage the growth of marginal and in channel vegetation.
iii) Selectively coppice bankside trees and manage hedgerows adjacent to ditches to encourage the growth of marginal and in channel vegetation and reduces leaf fall into the channel. Vegetation removal to be undertaken in winter.

Reedbeds

6.8.26 Reedbeds shall be cut on a five-year rotation (i.e. approximately one-fifth of vegetation shall be cut each year and arisings removed from the reedbed). Cutting shall take place in the autumn, avoiding the main bird breeding season

[12] People's Trust for Endangered Species (undated). *Helping Water Voles on Your Land*. [online] Available at https://ptes.org/wp-content/uploads/2019/07/Helping-water-voles-on-your-land.pdf [Accessed April 2025.]

(March to August, inclusive). The aim shall be to provide a diversity of reeds of different heights and ages.

6.8.27 Management shall control the spread of non-native species if necessary, which shall typically be removed in the winter following identification. If best practice for the control of particular species requires removal at other times, then this shall be followed.

6.8.28 Key maintenance objectives for reedbed are as follows:

i) Achieves UKHab definition of Reedbed.
ii) Maintaining good water quality, with no obvious signs of pollution or eutrophication.
iii) There is an absence of scrub and trees.
iv) There is an absence of bare ground.
v) Maintain a diverse structure, with 60-80% reeds and at least 10% open water.

6.8.29 In order to provide additional benefits for water vole within the areas of new reedbed, islands and high banks will be created and managed within the reedbeds. High banks or islands allow refuge during times of flooding.

Waterbodies

6.8.30 Vegetation growth shall be encouraged within the waterbodies, as long as this does not prejudice drainage. Where the presence of vegetation is inhibiting drainage, this shall be cleared (all arisings to be removed) or other appropriate steps taken to remedy the situation.

6.8.31 Once established, marginal vegetation will be cut on a rotational basis, with 25% being cut each year. Areas to be cut shall be cut to 50mm in September with arisings being left for 5-7 days before removal.

6.8.32 Other maintenance actions may be required, such as removal of sediment, which would impact the landscape proposals as grass and plants are likely to be damaged in the process. When this occurs, the affected areas will be re-

seeded with the same mix as originally specified, or similar, as available. Additional plug planting will be carried out with the original species and sizes. New planting and seeding will revert to a year of establishment maintenance before being incorporated back into the long-term maintenance operations.

6.8.33 As set out in Section 6.5, management shall control the spread of non-native species, which shall typically be removed in the winter following identification. If best practice for the control of particular species requires removal at other times, then this shall be followed.

6.8.34 Key Maintenance objectives for waterbodies (ponds) are as follows:

i) Achieves UKHab definition of Pond (non-priority).
ii) Maintaining good water quality, with no obvious signs of pollution or eutrophication.
iii) There is an absence of artificially stocked fish.
iv) Emergent submerged or floating plants cover at least 50% of the pond area which is less than 3m deep.
v) Pond surface is no more than 50 % shaded by trees/scrub.

6.9 Non-Breeding Bird Mitigation Area

6.9.1 Proposals within the NBBMA will be implemented and managed as described in **Appendix B** of this document, and are not repeated in detail here.

6.9.2 The principal aim of the NBBMA is to deliver mitigation for the loss of habitat for foraging curlew, lapwing and golden plover through the provision of higher quality habitat.

6.9.3 Measures that are proposed are:

i) Provision of additional habitats for SPA species through the creation of scrapes with extensive wet edges.
ii) The inclusion of island features to provide high-tide and safe roosting opportunities for SPA species.
iii) Provide improved foraging opportunities for winter and passage SPA species through control of water levels (i.e., ensuring grassland and scrapes remain wet under normal conditions).
iv) Preventing possible spread of New Zealand Pigmy Weed across Frodsham Marsh, and in particular into existing wetland features associated with mitigation measures for Frodsham Wind Farm.
v) Re-engineering of soil, with re-seeding of grassland and subsequent control of grazing/mowing regime will remove the existing seedbed and therefore solve on-going issues of ruderal vegetation encroachment.
vi) Removal of a small stand of semi-mature sycamore trees, thereby increasing the attractiveness of surrounding habitats to grassland waders (SPA species) and reducing perching/nesting opportunities for avian predators.
vii) Removal of the Canal Pools and associated recreational fishing will lead to a cessation of public access to the NBBMA and therefore reduced disturbance.
viii) Conservation focussed grazing (or cutting) management across the NBBMA area throughout the lifetime of the Proposed Development (with the cessation of the current grazing lease).

ix) Installation of predator fencing around the perimeter of the NBBMA.

6.10 Skylark Mitigation Area

6.10.1 The Skylark Mitigation Area would be managed as 'other neutral grassland' for the operational life of the Proposed Development. This will provide invertebrate habitat, thus acting as a forging resource, and will also be suitable for use by nesting skylark. Refer to **Section 6.7** for details of management and maintenance.

6.11 Physical Habitat Creation Structures

Bird Screening Measures

6.11.1 Bird Screening Measures would be installed in the broad locations illustrated on the **IEM** (**Appendix A**) unless local topography can provide the desired screening. These measures would have a dual purpose and would be intended to prevent disturbance to birds by movement of people along adjacent routes and also to provide opportunities for bird watching.

6.11.2 The screening measures are anticipated to comprise timber fencing of sufficient height to screen people from view (e.g. up to c.2m), but with 'windows' to allow views though for bird-watchers. Hides may also be installed some locations.

6.11.3 Details of the locations, design, installation and maintenance of the bird screening measures will be specified in the final LEMP. The **DAD [EN010153/DR/5.8]** provides further information and discussion in relation to the design of these measures.

Bat Boxes

6.11.4 A total of 60 no. bat boxes, including a minimum of 5 no. hibernation boxes and 5 no. maternity boxes would be installed. Approximate locations will be specified within the final LEMP.

6.11.5 Bat roost boxes will be installed on suitable mature and semi-mature trees along field boundaries and within woodland within the Order Limits. If the

required number of suitable trees cannot be identified, then boxes will be pole mounted. Precise locations will be subject to confirmation during the installation depending on the box and condition of trees. Boxes will be erected in suitable habitats, at an appropriate height (ideally above 4m in height) and with clear flight paths to utilise the Site field boundary features. Bat boxes should ideally be sited in clusters of two or three boxes, in open sunny positions facing different directions to provide a variety of micro-habitats.

6.11.6 Details of the design, installation and monitoring of each different type of bat box will be set out in the final LEMP.

Bird Boxes

6.11.7 A minimum of 2 no. barn owl nest boxes will be installed on suitable mature trees or poles within the SADA, but at least 1km from the M56. The two barn owl boxes would ideally be located between 200 m and 500 m apart; precise locations will be agreed upon with the project ecologist and will be subject to confirmation during the installation depending on tree condition at that time.

6.11.8 A minimum of 2 no. kestrel boxes will be installed, positioned within mature hedgerows or on mature trees or poles within the SADA, in close proximity to areas of grassland to be retained/created.

6.11.9 A minimum of 30 no. small, open-fronted and hole-fronted nest boxes of various designs will be installed, positioned within existing hedgerows, tree belts, or woodland within the SADA. Boxes will be erected at an appropriate height of between 1 to 5 metres. If the required number of suitable trees cannot be identified, then boxes will be pole mounted. Positioning within or close to hedgerows, tree belts and woodland will increase chances of occupation.

6.11.10 All boxes will be angled so that they face away from the prevailing wind, and all boxes will be positioned so that the front of the boxes are not obstructed and there is a clear flight path into the box.

6.11.11 Details of the design, installation and monitoring of each different type of bird box will be set out in the final LEMP.

Reptile/Amphibian Refugia

6.11.12 A total of 10 no. reptile/amphibian refugia will be installed at locations to be specified within the final LEMP. Refugia will be located adjacent to either a hedgerow or woodland; each will measure approximately 2m x 2m x 1m in height. The hibernacula will be constructed from logs and/or clean bricks/rubble sourced locally as far as possible, or with 'clean' materials brought in from elsewhere where this is not possible and topped with soil and earth. The hibernacula will provide shelter and over-wintering refuge for amphibians, reptiles, small mammals and invertebrates.

6.11.13 Details of the design, installation and monitoring of refugia will be set out in the final LEMP.

Hedgehog Boxes

6.11.14 A total of 20 no. hedgehog boxes will be installed at locations to be specified within the final LEMP. Precise locations will be subject to confirmation during the installation but will be concentrated within sheltered and undisturbed locations within woodland and along boundary features such as hedgerows. The entrances will be placed out of the weather, ideally facing east to south.

6.11.15 Details of the design, installation and monitoring of hedgehog boxes will be set out in the final LEMP.

Insect Hotels

6.11.16 A total of 10 no. insect hotels will be installed at locations to be specified within the final LEMP. Precise locations will be subject to confirmation during the installation depending on the box/hotel and condition of trees (if required). Boxes will be erected at sheltered undisturbed locations and be angled so that they face away from the prevailing wind. A selection of boxes/hotels will be used, providing suitable habitat for a variety of invertebrate species.

6.11.17 Details of the design, installation and monitoring of insect hotels will be set out in the final LEMP.

6.12 Management and Maintenance Schedules

6.12.1 The schedules set out below in **Table 3, Table 4 and Table 5** outline the anticipated timing of the proposed landscape and ecological management and maintenance works.

Table 3: Implementation Works

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Other neutral grassland seeding				✓					✓			
Marshy grassland seeding (*preferred month)			✓	✓			✓	✓*	✓*			
Tree, shrub and hedge planting (*preferred month)	✓	✓									✓*	✓*
Wetland plug planting			✓	✓					✓	✓		
Watering		Water directly following planting, and as required to ensure establishment e.g. during periods of drought										

Table 4: Establishment Management

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Initial cut of other neutral grassland – if autumn sown				✓ (70-100mm)			✓ (40-60mm)	✓ (40-60mm)	✓ (40-60mm)	✓ (40-60mm)		
Initial cut of other neutral grassland – if spring sown				✓ (40-60mm)	✓ (40-60mm)	✓ (40-60mm)	✓ (40-60mm)	✓ (40-60mm)	✓ (40-60mm)	✓ (40-60mm)		
Initial cut of marshy grassland – if autumn sown	✓	✓	✓							✓	✓	✓
Initial cut of marshy grassland – if spring sown	✓	✓	✓					✓	✓	✓	✓	✓
Wetland plug planting cut									✓			
Check of planting stock, stakes, guards, and mulch levels			✓						✓			
Replanting of failed tree and shrub species (* preferred month)	✓	✓									✓*	✓*
Herbicide treatment to tree planting stations and hedgerows – if required				✓		✓		✓				
Fertiliser treatment for trees									✓			
Annual review							✓		✓			
Watering	As required to ensure establishment e.g. during periods of drought											
Litter control	Each visit											

Table 5: Long-term Management

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cut other neutral grassland (August/September leave arisings 5-7 days before removal)		✓						✓				
Grazing (land within solar security fencing)	✓	✓							✓	✓	✓	✓
Management of wetland bankside vegetation – 25% of area cut to 50mm annually (leave arisings 5-7 days before removal)										✓		
Cut reedbeds – 25% of area cut annually (arisings removed)										✓		
Thinning, coppicing or other cutting of trees/shrubs										✓	✓	✓
All hedgerows – 3-year rotational routine: cut $^{1}/_{3}^{rd}$ of site hedgerows each year										✓	✓	✓
Annual review									✓			
Litter control	Every visit											
Maintenance of fencing and access routes	As required											

7.0 MONITORING AND REVIEW

7.1 Introduction

7.1.1 Regular monitoring of the landscape and ecology works is key to identifying whether or not they are likely to meet identified targets and are ultimately meet the Project Design Principles and Design Vision for the Proposed Development.

7.2 General Monitoring

7.2.1 A Site Inspection shall be undertaken every two years, up to Year 10, once the Proposed Development becomes operational, and then every five years[13], to review management successes/ failures gauged against the Project Design Principles outlined in **Section 4.0** of the **oLEMP** (or the equivalent section of the final LEMP), and to make any adjustments to the management/maintenance regime that the findings of such inspections indicate would be appropriate.

7.2.2 Representatives from CWaCC and other key stakeholders, envisaged to include FTC, CWT and the Royal Society for the Protection of Birds ('RSPB'), would be invited to attend the Site Inspections with representatives of the Applicant. Any modifications to management would be made in agreement with CWaCC.

7.2.3 Monitoring will consider the potential effects of climate change upon the works. A changing climate may affect the success of particular species. As such, it may be necessary to substitute particular species, with alternative, more resilient species. Additionally, changes to management and maintenance operations may also be deemed necessary to address specific climate change related issues.

[13] E.g. Years 2, 4, 6, 8, 10, 15, 20, 25, 30, 35, and 40.

7.2.4 An Update Report would be submitted to CWaCC following each visit and would include details of any observations made during the Site inspection, other observations made during ongoing maintenance, results of all monitoring undertaken by the Applicant, and any changes to management and maintenance operations agreed with CWaCC. This allows for further detail regarding the management and restoration of the Site to be provided to CWaCC, as and when such details become available.

7.2.5 The Update Report would include set out details of the activities carried out since the previous Site Inspection[14], and activities programmed up to the next Site Inspection.

7.3 Biodiversity Net Gain Monitoring

7.3.1 While not subject to statutory BNG requirements, the Proposed Development has made a commitment to achieving a minimum of 10% increase in habitat and hedgerow units, and no net loss in watercourse units, and as such the development of the biodiversity interest of the Site will be monitored over time by a suitably experienced ecologist. A walkover survey will be undertaken in Years 1, 2, and 5, and then every five years throughout the operational phase.

7.3.2 This will involve an inspection of the created and retained habitats to ensure that they are being managed in a manner suitable for the enhancement of wildlife interest. The results of these monitoring surveys will be used to inform remedial actions required to achieve the relevant Project Design Principles and/or adhere to relevant wildlife conservation legislation at that time.

7.3.3 Monitoring will include a habitat survey undertaken between May and September, following industry standard UK Habitat Survey (‘UKHab’) methodology, as used for the BNG assessment, and condition assessment using the relevant condition criteria contained within the Statutory Biodiversity Metric Condition Assessment Guide to ensure created habitats are achieving

[14] Or in the case of the first Update Report, works carried out since implementation.

the stated habitat type and condition. Following completion of monitoring, a report will be compiled and distributed to CWaCC, including any proposed remedial measures.

7.4 Ornithological Monitoring

7.4.1 The requirements for ornithological monitoring will be agreed with NE and CWaCC, and will be detailed within the final LEMP. However, as set out in the outline NBBMS (Appendix B of this document) this is not a reliable method to determine the success or otherwise of achieving target habitat conditions due to other factors which may influence bird populations and distribution.

7.5 Additional Survey Requirements

7.5.1 Further measures to ascertain the success of habitat management will be considered, for example, within the NBBMA and will be subject to further discussions with NE and CWaCC along with other pertinent stakeholders such as RSPB. The outline NBBMS (Appendix B of this document) identifies a series of objectives which the strategy seeks to achieve. The document sets out that measurable targets on which to determine the success of the outline NBBMS and on-going management will be set and agreed with key consultees in the final NBBMS document.

7.5.2 An assessment of species enhancement measures (including the bat, bird and hedgehog boxes, reptile/amphibian refugia and insect hotels), including an assessment of the integrity of such features, would also be undertaken. Where appropriate, usage of such features will also be assessed.

7.5.3 All surveying/assessment would be undertaken by a suitably qualified ecologist/ornithologist.

7.6 Remedial Measures

7.6.1 If the monitoring outlined above identifies that a habitat is not meeting the target condition or is not meeting the description for the proposed habitat type

then contingency measures appropriate for habitat in question would be followed.

7.6.2 In all cases, where a failure is identified, the root cause should be identified and remedial measures implemented.

7.6.3 Remedial measures appropriate for each habitat type will be set out in the final LEMP

7.7 Additional Monitoring

7.7.1 A management and monitoring plan to mitigate any adverse effects to protected and notable habitats and species would be prepared, details of which would be set out within the final LEMP and approved by regulatory authorities prior to implementation. It is expected this would include for monitoring of water quality within surrounding surface watercourses and surveying such as invertebrate abundance monitoring.

7.7.2 Bird, bat, insect and hedgehog boxes, and log piles and hibernacula will be checked to ensure they are in place and in working order. The results of these monitoring surveys will be used to inform the need or otherwise to replace missing boxes/hotels or re-build damaged hibernacula.

7.7.3 As set out in **Section 6.5**, monitoring would be undertaken of any potential car parking along Moorditch Lane and any resulting access issues this may cause for other users of Moorditch Lane. The results of this monitoring would inform the provision of the potential visitor car park, or other potential solutions.

7.8 NBBMA

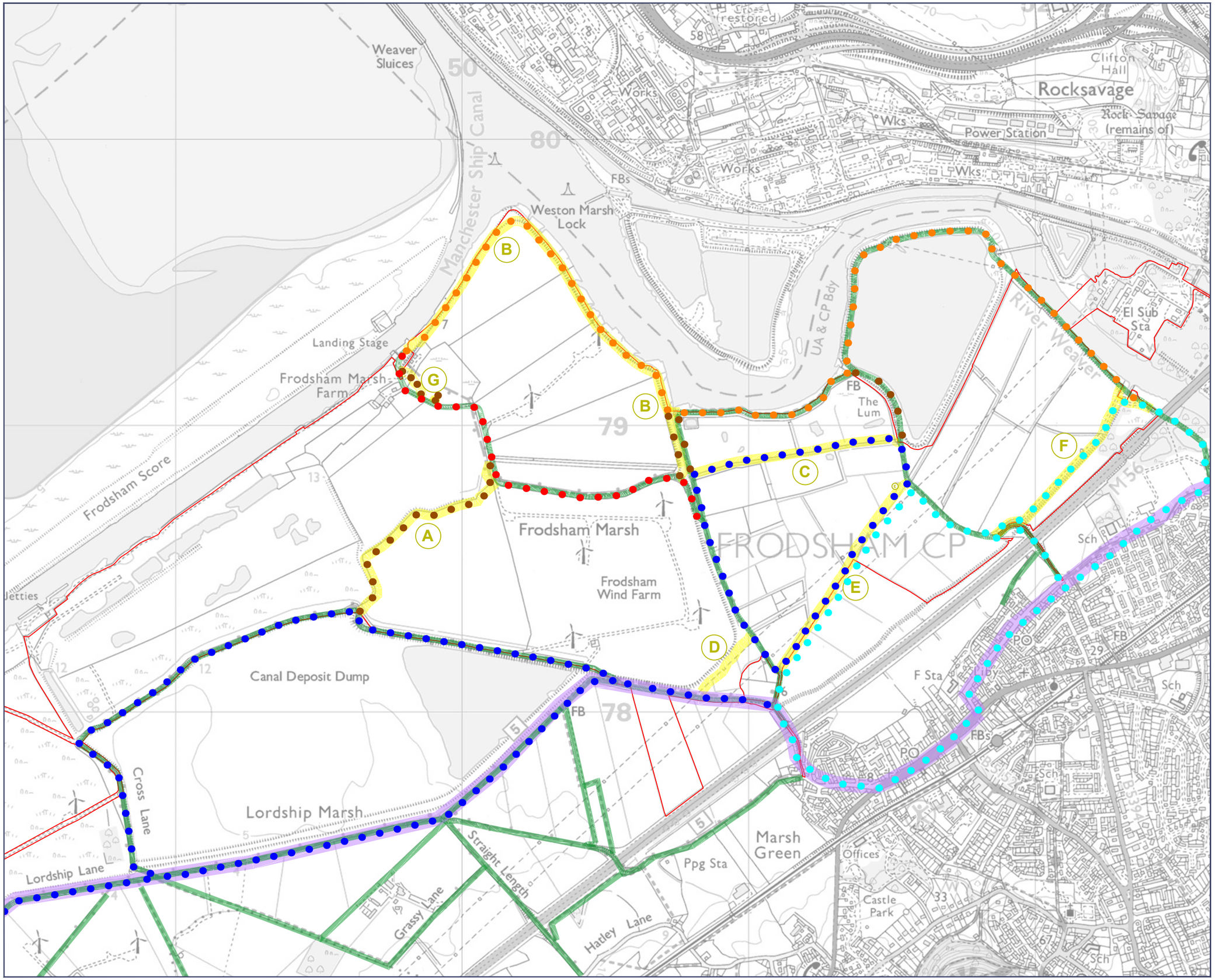
7.8.1 As set out above the proposed monitoring and review measures for the NBBMA are set out in **Appendix B**.

7.8.2 A management and monitoring plan to mitigate effects on wading birds during the large-scale excavation works required for the creation of the NBBMA will also be prepared to cover works within Cell 3 and the ponds to the north. It is

anticipated that this will entail a watching brief by a suitably qualified ecologist/ornithologist, monitoring of water quality within surrounding surface watercourses, and surveying such as invertebrate abundance monitoring. This would cover the construction period and the first year of operation. This monitoring is detailed in the **oCEMP [EN010153/DR/7.5]** and full details will be set out in the final CEMP, and provisions for implementation will be included in the final LEMP as necessary.

7.8.3 The outline **Soil Management Plan (oSMP) [EN010153/DR/7.10]** describes how soils across the Site will be managed in order to facilitate the proposed landscaping and ecological works across the Site. The oSMP also includes details of how soils which may be subject to contamination would be managed, this is also controlled through measures set out in the oCEMP. Full details will be set out in the final SMP and CEMP, and provisions for implementation will be included in the final LEMP as necessary.

Figures



- Order Limits
- Public Right of Way
- Proposed Permissive Path
- National Cycle Route 5
- Restricted Byway (current access levels retained)
- Access for All
- Cycle/Equestrian Loop
- Continuous Waterside Trail (pedestrians only)
- Pedestrian Access

Refer to the Outline Landscape and Ecology Management Plan document for details of permissive paths A-G

Case Reference: EN010153
Document Reference: EN010153/DR/7.13
Regulation 5(2)(a) Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Document
Outline Landscape and Ecology Management Plan

Project
FRODSHAM SOLAR

Figure Number
Figure 1

Figure Title
Indicative Route Hierarchy

Scale
1:12,500 @A3

Date
May 2025

Appendix A – Illustrative Environmental Masterplan

INTERPRETATION PANELS

- Welcome to Frodsham Solar Park (general information and maps
- A. Bird Mitigation Area Information
- B. Pipelines
- C. Reedbeds
- D. Manchester Ship Canal
- E. Mersey Estuary View
- F. Frodsham Wind Farm
- G. Geography/Geology - e.g. River/Sandstone Ridge
- H. Weston Bank Industry and River Weaver
- I. River Weaver and Weaver Navigation

- Order Limits
- Solar PV Modules
- Principal Public Access / Biodiversity Enhancement Zones
- Retained/created neutral grassland or modified grassland
- Public Right of Way
- Proposed Permissive Path
- Existing Vegetation
- Proposed Native Woodland
- Proposed Native Scrub
- Proposed Native Trees and Shrubs
- Proposed Native Hedgerow
- Proposed Native Hedgerow (maintained at a low height)
- Area for Potential Skylark Mitigation plots
- Non Breeding Bird Mitigation Area

N

0 250 500 750 1000 1250 1500m

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Outline Landscape and Ecology Management Plan

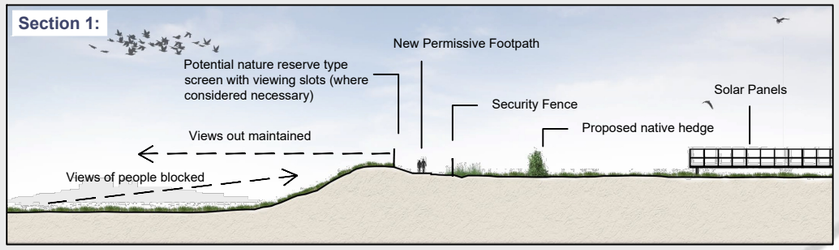
Figure Number: **Figure A1.1**

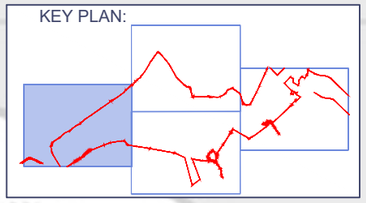
Revision: **P01**

Figure Title: **Illustrative Environmental Masterplan Key Plan**

Scale: **1:15,000 @A3**

Date: **May 2025**





Potential viewing point over the NBBMA

Frodsham Marsh Farm

Existing tree cover removed

Neutral grassland areas to be managed to provide foraging habitat

Proposed water storage area on raised bank

Neutral grassland areas to be managed to provide foraging habitat

Manchester Ship Canal

New island within scrapes to provide roosting and nesting locations for birds

Existing drainage ditch

New islands within scrapes to provide roosting and nesting locations for birds

New wet (marshy) grassland area adjacent to existing and proposed scrapes

Existing drainage ditch

New wet (marshy) grassland area adjacent to existing and proposed scrapes

Potential bicycle parking

Potential bird screening measures (where considered necessary): Timber structures with viewing slots

Proposed permissive path A links Brook Furlong to Moorditch lane, creating a new loop in the network and providing for a wide variety of currently unavailable route options

Sheet 1 (Figure 2-3b)

Sheet 2 (Figure 2-3c)

Sheet 3 (Figure 2-3a)

- Order Limits
- Solar PV Modules
- Solar Array Security Fence (indicative draft layout)
- Solar Array Utility Fence (indicative draft layout)
- Bird Screening Measures
- Public Right of Way
- Proposed Permissive Path
- Existing Vegetation
- Neutral Grassland
- Marshy Grassland
- Raised Bank
- Existing Drainage Ditch
- Existing Scrape
- Proposed Scrape
- Proposed Water Storage Area
- Section Line

N

0 100 200 300 400 500m

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Outline Landscape and Ecology Management Plan

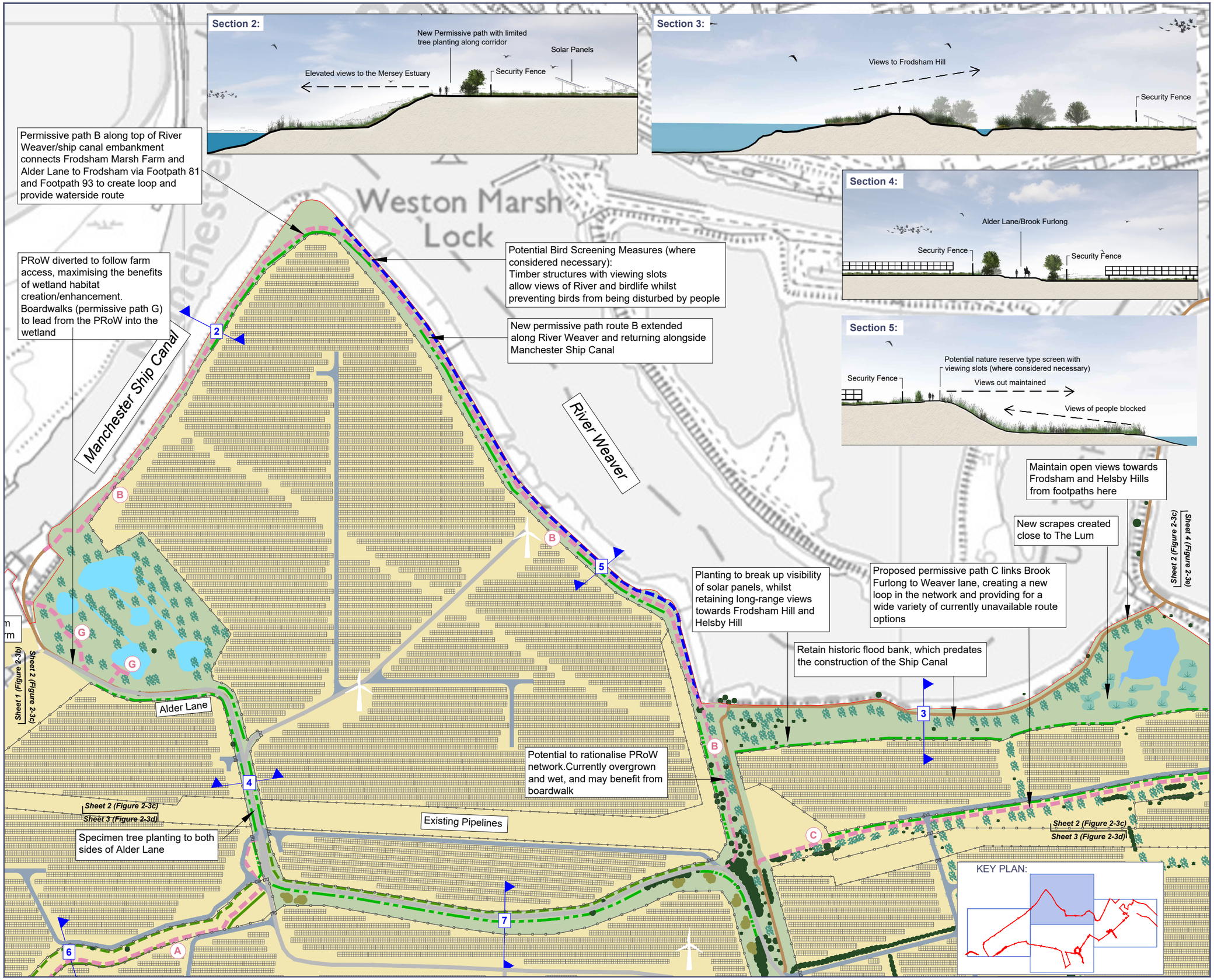
Figure Number: **Figure A1.2**

Revision: **P01**

Figure Title: **Illustrative Environmental Masterplan Sheet 1**

Scale: **1:5000 @A3**

Date: **May 2025**



- Order Limits
- Solar PV Modules
- Solar Array Security Fence (indicative draft layout)
- Solar Array Utility Fence (indicative draft layout)
- Indicative Access Track
- Potential Overhead HV Line
- Principal Public Access / Biodiversity Enhancement Zones
- Retained/created neutral grassland or modified grassland
- Retained/created reedbed
- Proposed pond/ditch
- Public Right of Way
- Proposed Permissive Path
- Existing Vegetation
- Proposed Native Woodland
- Proposed Native Scrub
- Proposed Native Trees and Shrubs
- Proposed Native Hedgerow
- Proposed Native Hedgerow (maintained at a low height)
- Section Line

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Document Reference: EN010153/DR/7.13
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Figure Number: **Figure A1.3**
Revision: **P01**

Figure Title:

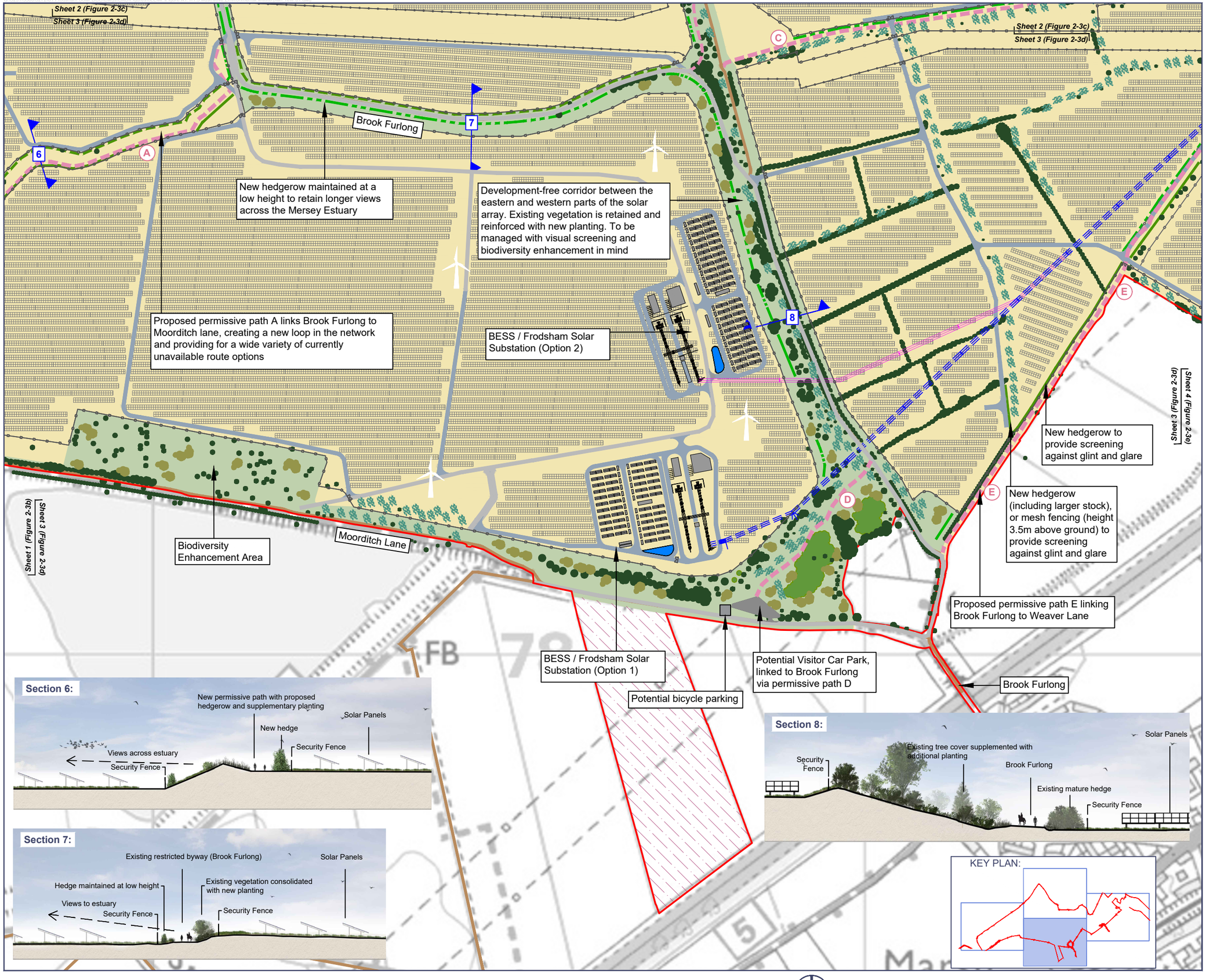
Illustrative Environmental Masterplan Sheet 2

Scale:

1:5000 @A3

Date:

May 2025



- Order Limits
- Solar PV Modules
- Solar Array Security Fence (indicative draft layout)
- Solar Array Utility Fence (indicative draft layout)
- Indicative Access Track
- Potential Overhead HV Line
- Principal Public Access / Biodiversity Enhancement Zones
- Retained/created neutral grassland or modified grassland
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- Proposed Native Trees and Shrubs
- Proposed Native Hedgerow
- Proposed Native Hedgerow (maintained at a low height)
- Section Line

Case Reference: EN010153
Document Reference: EN010153/DR/7.13
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Outline Landscape and Ecology Management Plan

Figure Number: **Figure A1.4**
Revision: **P01**

Figure Title:

Illustrative Environmental Masterplan Sheet 3

Scale: **1:5000 @A3**

Date: **May 2025**

NB. This area is not open water, but is now covered with grassland and scrub

Planting to break up visibility of solar panels, whilst retaining long-range views towards Frodsham Hill and Helsby Hill

River Weaver

Viaduct

Permissive path F to enhance and connect Weaver Lane to River Weaver

Proposed screen planting to provide glint and glare mitigation

Permissive path F to enhance and connect Weaver Lane to River Weaver

New tree and hedgerow planting to screen solar panels from the south

Weaver Lane

Proposed screen planting to provide glint and glare mitigation

Frodsham

Frodsham Bridge

Viaduct

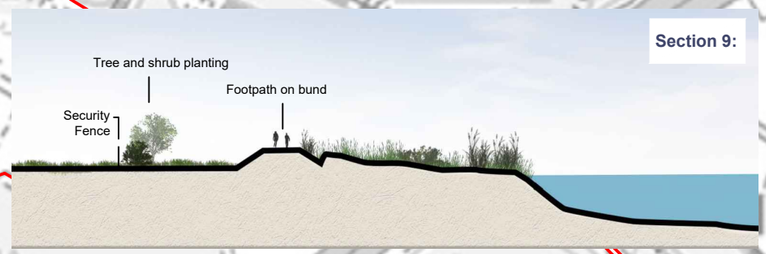
Sheet 2 (Figure 2-3c)

Sheet 4 (Figure 2-3e)

Sheet 4 (Figure 2-3e)

Sheet 3 (Figure 2-3d)

Section 9:



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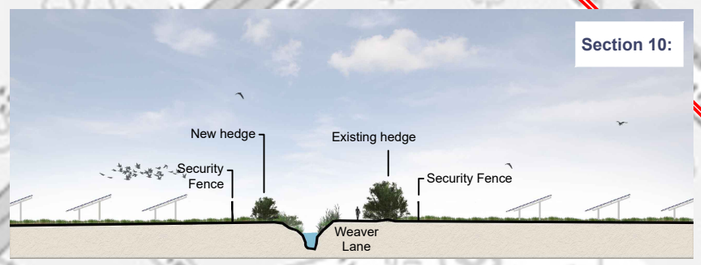
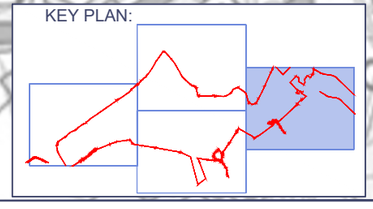


KEY PLAN:



N

0 100 200 300 400 500m

- Order Limits
- Solar PV Modules
- Solar Array Security Fence (indicative draft layout)
- Solar Array Utility Fence (indicative draft layout)
- Indicative Access Track
- Potential Overhead HV Line
- Potential Underground 132kV Cable
- Principal Public Access / Biodiversity Enhancement Zones
- Retained/created neutral grassland or modified grassland
- Retained/created reedbed
- Proposed pond/ditch
- Public Right of Way
- Proposed Permissive Path
- Existing Vegetation
- Proposed Native Woodland
- Proposed Native Scrub
- Proposed Native Trees and Shrubs
- Proposed Native Hedgerow
- Proposed Native Hedgerow (maintained at a low height)
- Section Line

Case Reference: EN010153
Document Reference: EN010153/DR/7.13
Regulation 5(2)(a) Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

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Outline Landscape and Ecology Management Plan

Figure Number: **Figure A1.5**

Revision: **P01**

Figure Title: **Illustrative Environmental Masterplan Sheet 4**

Scale: **1:5000 @A3**

Date: **May 2025**

Appendix B – Outline Non-Breeding Bird Mitigation Strategy

Outline Landscape and Ecological Management Plan

Appendix B - Outline Non-Breeding Bird Mitigation Strategy (oNBBMS) [EN010153/DR/7.13]

Frodsham Solar, for Frodsham Solar Ltd

avian ecology

Document Control				
Project Name:	Frodsham Solar			
Project Number:	AxisL-043-3114			
Report Title:	Outline Non-Breeding Bird Mitigation Strategy			
Issue	**Date**	**Notes**	**Prepared**	**Reviewed**
v1	16.05.25		K. Doneo *BSc MSc MCIEEM* Principal Ornithologist	H. Fearn *MSc MCIEEM* Managing Director

CONTENTS

FIGURES

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1 INTRODUCTION

1.1.1 This Outline Non-Breeding Bird Mitigation Strategy ('ONBBMS') has been prepared by Avian Ecology Ltd. on behalf of Frodsham Solar Ltd ('the Applicant'), for the proposed Frodsham Solar project (the 'Proposed Development').

1.1.2 The measures proposed will provide mitigation for the anticipated displacement of wetland birds associated with the Mersey Estuary Special Protection Area (SPA), Ramsar and Site of Special Scientific Interest (SSSI) as a result of the Proposed Development.

1.1.3 The proposed measures, primarily the creation of high-quality wetland habitats, represent an ambitious conservation strategy, which will deliver mitigation for the Proposed Development combined with substantial enhancements that will benefit multiple wetland bird species, including SPA species. The habitats will be managed over a 40-year period.

1.2 Terms of Reference

1.2.1 The following terms of reference are used throughout this document:

- Outline Non-Breeding Bird Mitigation Strategy (ONBBMS), which will be finalised through DCO Requirement in to the final Non-Breeding Bird Mitigation Strategy ('NBBMS').
- The Site: the Order Limits for the Proposed Development (as shown on **Figure 1**).
- The Solar Array Development Area ('SADA'): land within the Site where the main solar development and associated infrastructure will be located.
- The Non-breeding Bird Mitigation Area ('NBBMA'); all land covered as part of the ONBBMS – primarily Cell 3, but also including the Canal Pools, part of Cell 2 and land adjacent to the Manchester Ship Canal (as shown on **Figure 2**).
- Manchester Ship Canal Dredging Deposit Cells numbered 1 – 6 (as shown on **Figure 1** and referred to as 'Cells' throughout this document).
- The 'Canal Pools' (as shown on **Figure 2**).
- Frodsham Wind Farm ('FWF') existing mitigation measures (as shown **on Figure 2**).

1.3 The Mersey SPA, Ramsar and SSSI.

1.3.1 The Mersey Estuary is designated as an SPA, Ramsar and SSSI and is located adjacent to the north western boundary of the Site. The SPA and Ramsar designations are consistent; however, the SSSI also includes the MSC and part of the Canal Pools (see **Plate 2** for the extent of the SSSI).

1.3.2 **Box 1.1** presents the qualifying features (species) of the Mersey Estuary SPA, hereafter referred to as 'SPA species'. No additional bird species are named as Ramsar or SSSI features and therefore the designations are considered concurrently. i.e., the term SPA species also includes bird species for which the Ramsar and SSSI are designated.

Box 1.1: The Mersey Estuary SPA qualifying features[1].

In accordance with the European Site Conservation Objectives for the Mersey Estuary SPA Site Code: UK 9005131 (v5, dated 21st February 2019), and the Mersey Estuary SPA Citation (v1.1, dated May 2004) the qualifying features of the SPA include:

- Common Shelduck *Tadorna tadorna* [Non-breeding]
- Eurasian Teal *Anas crecca* [Non-breeding]
- Northern Pintail *Anas acuta* [Non-breeding]
- European golden plover *Pluvialis apricaria* [Non-breeding]
- Dunlin *Calidris alpina alpina* [Non-breeding]
- Black-tailed godwit *Limosa limosa islandica* [Non-breeding]
- Common Redshank *Tringa totanus* [Non-breeding]
- Waterbird assemblage [non-breeding period]

Non-qualifying species of interest include Bewick's swan *Cygnus columbianus bewickii*, whooper swan *Cygnus cygnus*, merlin *Falco columbarius*, peregrine *Falco peregrinus*, ruff *Philomachus pugnax*, bar-tailed godwit *Limosa lapponica* and short-eared owl *Asio flammeus* which all occurred in non-breeding numbers of less than European importance (less than 1% of the GB population).

1.4 ONBBMS Principles

1.4.1 The ONBBMS provides information on the proposed approach to mitigation for SPA species.

1.4.2 Post-consent, the ONBBMA will be developed into a full plan which must be in substantial accordance with the outline and will require approval by Cheshire West and Chester Council (CWACC) in consultation with Natural England and the RSPB. The Proposed Development must be undertaken in accordance with the approved plan. This is secured via a Requirement in Schedule 2 of the draft DCO [EN010153/DR/3.1].

1.4.3 The Proposed Development has the potential to impact on Functionally Linked Land ('FLL') to the Mersey SPA, through:

- Displacement of Mersey Estuary SPA wetland bird species due to the presence of solar panels and other infrastructure; and/or,
- Increased disturbance to Mersey Estuary SPA wetland bird species during construction, operation and decommissioning of the Proposed Development.

1.4.4 The effects arising from the Proposed Development will be separate to, and in addition to, those already arising from the Frodsham Wind Farm. Accordingly, the ONBBMS has been developed cognisant of this additional impact, and of the approved and functioning mitigation for FWF. The measures proposed within the ONBBMS are therefore provided in addition to those already implemented. This approach is subsequently termed 'additive mitigation', which is best summarised as a 'quality over quantity' approach.

[1] Available online at: https://publications.naturalengland.org.uk/publication/5790848037945344 [accessed May 2024]

1.4.5 The additive mitigation approach is considered compliant with guidance from Natural England[2] regarding development mitigation and compensation measures for wild birds, which states:

'There should be a suitable amount of replacement habitat to compensate for the displacement. For example, there should be:

- *no net loss of habitat*
- *like-for-like replacement near to the original nest to provide a long-term home*
- *alternative habitat that is better in quality or area than the lost habitat*
- *maintained habitat connection to allow normal bird movement*

The development proposal should make sure compensation sites are established for wild birds to use before work starts'.

1.4.6 The ONBBMS provides a robust and ambitious mitigation / enhancement scheme, which:

(1) Ensures that existing within-site mitigation measures for FWF continue to be provided;

(2) Extends the lifetime of the FWF measures by an additional 27 years (required until 2042 only);

(3) Delivers the additional mitigation required for the Proposed Development, ensuring that there will be no adverse effect on the integrity of the Mersey Estuary SPA and Ramsar (or the SSSI); and

(4) Delivers further benefits to Mersey Estuary SPA /Ramsar species and breeding wetland bird species.

1.5 Stakeholder Engagement

1.5.1 Measures proposed in the ONBBMS have been discussed extensively with key stakeholders, primarily Natural England and the RSPB. Both parties have accepted the additive mitigation principle and subsequently discussions primarily centred on the extent of mitigation required for SPA species.

1.5.2 The measures included in the ONBBMS are agreed in principle with NE and RSPB. Further stakeholder engagement details are presented in the Environmental Statement: **ES Vol 1 Chapter 8: Ornithology [EN010153/DR/6.1]**.

1.6 Baseline Bird Data

1.6.1 This ONBBMS does not provide comprehensive details of field survey results and desk study; information is summarised for the purposes of the consultation. Comprehensive data is presented in **ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2]**.

1.6.2 Summary tables of key data are provided throughout this document, where appropriate.

1.7 Proposed Development and Site Context

1.7.1 The Proposed Development comprises solar PV modules and related mounting structures, inverters, transformers, switch gear and control equipment, a substation, and underground on and off-site cabling, as well as an associated Battery Energy Storage System (BESS). A full description of the

[2] https://www.gov.uk/guidance/wild-birds-advice-for-making-planning-decisions [accessed April 2025]

Proposed Development can be found in **ES Vol 1 Chapter 2: The Proposed Development [EN010153/DR/6.1]**.

1.7.2 The Proposed Development is located between the M56 Motorway and the Manchester Ship Canal approximately 500m north of the town of Frodsham, in an area generally referred to as 'Frodsham Marsh'.

1.7.3 **Figure 1** shows the Site (marked as a red line boundary), along with other key features in the wider Frodsham Marsh area, including the Mersey Estuary SPA / Ramsar, and the existing infrastructure of FWF.

1.7.4 Broadly, the Site comprises a combination of low-lying arable farmland in the east and raised Cells in the west, which comprise former settling tanks used for management of dredgings from the Manchester Ship Canal (MSC). Part of the low-lying arable farmland in the east (away from the Cells) is managed by wildfowlers for shooting purposes.

1.7.5 Cells are numbered from 1 to 6 (**Figure 1**). Of these, Cells 1, 2, 3 and 5 are located within the Site of the Proposed Development; these cells are no longer used for depositing of dredgings. Cell 6 is still actively used for the management of dredgings.

1.7.6 Cells 2, 3, 4 and 5 have existing ornithology-related management obligations under the planning conditions of the FWF planning consent.

1.7.7 The wider Frodsham Marsh is well established to be used by wetland birds from the Mersey Estuary (see Section 2). Usage by most SPA species is primarily associated with operational Cell 6, which provides areas of open wetland habitat and which change over time as they are used for the deposition of material dredged from the MSC. In recent decades, the majority of waterbird interest has been associated with Cell 6, which includes a large wetland. Cell 6 is outside of the Site and remains operational. Cells 1, 2 and 5 (inside the Site) are no longer in operational use and are now managed as pasture for livestock grazing. Cells 1, 2 and 5 are largely unsuitable for most SPA species, but with some exceptions (principally curlew, lapwing and golden plover). Cell 3 is managed for SPA species pursuant to the planning conditions of the FWF, through the creation of wet areas ('scrapes') and grassland for foraging SPA birds.

2 BASIS FOR MITIGATION

2.1.1 Parts of the Site (Cells 1, 2, 3 and 5) are located within areas which NE defines as having 'High Potential' to constitute Functionally Linked Land (FLL) to the Mersey Estuary SPA in report 'NECR483 Edition 1 Identification of Functionally Linked Land in the North West of England – Phase 2 (NECR483)[3]'. **Plate 1** is reproduced from this NE report. The NE report subsequently establishes that parts of the Site have potential to constitute FLL[4] regardless of field survey results.

2.1.2 Determining the extent of use of these land parcels (and the remainder of the Site) by SPA species was, necessary in determining the extent of mitigation required.

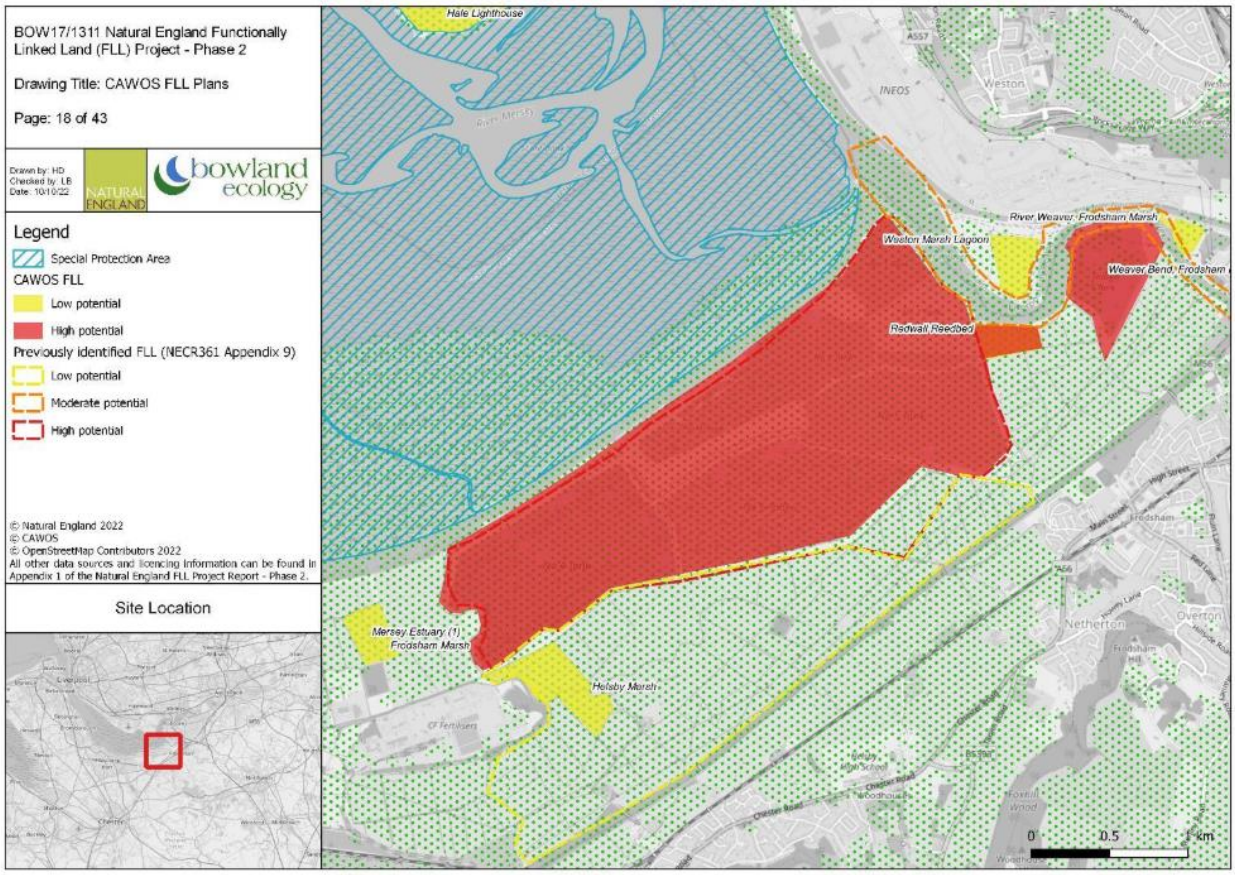
2.1.3 Parts of the Site, e.g., the arable farmland to the east of Brook Furlong, fall outside those identified by NE as having 'High Potential to constitute FLL'; however, it is acknowledged that these areas may also support SPA species, and it was therefore necessary to determine levels of use by SPA species across the entirety of the Site.

[3] Available online at: https://publications.naturalengland.org.uk/publication/5359972901453824 [accessed May 2024]
[4] It should be noted that some areas marked as 'High Potential' on Plate 1 appear to be included on the basis of historical land use and are no longer suitable for SPA species due to scrub and reedbed encroachment. It should not therefore be assumed that all areas marked continue to have High Potential to be FLL.

2.1.4 Based on survey results, desk study and habitat types, mitigation is considered primarily in relation to grassland wader species, namely golden plover, curlew and lapwing (i.e., the same species for which FWF delivers mitigation for). Other SPA species are only very rarely found on farmland (i.e., main areas affected by the Proposed Development) and therefore negative impacts on these species are considered likely to be nugatory; this is supported by extensive baseline data (see **ES Vol 2 Appendix 8-1: Ornithology Survey Report [EN010153/DR/6.2], Section 4 and Figures 6a to 86h for Year 1, Figure 8a to 8g for Year 2, and Figure 14a to 14f for Year 3)**.

2.1.5 It is acknowledged that Cell 3 is used by other species (primarily duck species); however, habitats within Cell 3 will be replaced. It is anticipated that most SPA qualifying species will benefit from the measures to be implemented in the NBBMA and therefore the proposed mitigation strategy also represents a substantial enhancement, both in terms of habitat quality and duration of availability.

Plate 1: Reproduced from NE report NECR483. Parts of the Site fall within the areas marked as having High Potential for FLL.



2.2 Frodsham Wind Farm Mitigation

2.2.1 FWF comprises 19 wind turbines (with a tip height of 125m). The wind farm consent included provision of mitigation habitat for non-breeding bird species associated with the Mersey Estuary SPA in Cells 2, 3 and 5 (**Figure 2**). These Cells are managed for Mersey Estuary SPA birds to mitigate impacts predicted to arise from the operation of the wind farm. The prescribed FWF management measures are detailed in the approved 'Outline Habitat Creation Management Plan: Frodsham Marshes Windfarm' (August 2014 report – pursuant to application 14/02525/DIS), hereafter the 'the HCMP'.

2.2.2 Cells 2, 3 and 5 are located within the Site (**Figure 1**). Existing wind farm mitigation measures for these Cells are summarised below.

- **Cell 2** and **Cell 5**. Both cells comprise grazed pasture with patches of extensive arable weed cover. Managed for Mersey Estuary SPA / Ramsar birds under the HCMP, prescribed as follows:

'To maintain the fields, for the duration of the lifetime of the wind farm, in a condition that is favourable for wintering wader species, including golden plover, lapwing and curlew'.

The entirety of Cell 2 and part of Cell 5 (**Figure 2**) are managed to provide short-sward grassland between October and March (inclusive), as a foraging habitat for the above species.

- **Cell 3.** Provides mitigation for the impacts of displacement on SPA birds as a consequence of the operational wind farm, and is prescribed in the HCMP as follows:

  'To create and maintain, across the whole area of Cell 3, a low sward grassland with shallow wader scrapes and areas of seasonally open water'.

2.2.3 It should be noted that the Canal Pools are located outside of Cell 3 and are therefore not included in the FWF mitigation measures in respect of habitat management, aside from the restriction of fishing rights.

2.2.4 Construction of FWF began in March 2015, and it became fully operational in February 2017. The wind farm has a consented lifetime of 25 years. Current mitigation obligations, as detailed in the HCMP, are therefore due to cease in 2042.

2.3 Cell 3: Current Management and Use by SPA Birds

2.3.1 To assist in determining the extent of mitigation required, it is first necessary to understand the levels of SPA species usage of the Cell under current FWF management prescriptions.

FWF Mitigation: Current Management

2.3.2 Under the HCMP, the current mitigation objective for Cell 3 is: '*To create and maintain, across the whole area of Cell 3, a low sward grassland with shallow wader scrapes and areas of seasonally open water*'. These are set out in a report titled '*Cell 3 Scrape and Wetland Design'* for Frodsham Wind Farm (Atmos Consulting, 06 June 2014).

2.3.3 The management and monitoring of Cell 3 mitigation is overseen by a Habitat Creation and Management Group (HCMG), with annual reports produced for Years 1 to 5 of operation. The most recently available report is '*Frodsham Wind Farm Post-Construction Ecological Monitoring Report: Year Five 2021'* (Atmos Consulting September 2022). A copy of this report is provided as **Annex 2**.

2.3.4 According to the Year 5 (2021) monitoring report, scrapes have been successfully created in accordance with **Figure 2,** and these are satisfactorily used by waterfowl (SPA species) in the winter months.

2.3.5 Scrapes are understood to dry-out regularly, which can be expected to continue with increasingly dry conditions establishing in the UK, and are currently entirely rainwater fed. It is reasonable to assume that scrapes are typically available for use by SPA species over the winter (generally wetter) period and to some extent into the spring (conditions depending). Scrapes are most likely to dry-out over the summer and therefore be unavailable to autumn passage (and potentially breeding) birds. This drying-out is noted in the HCMG Year 5 wind farm monitoring report and has been observed on Site during surveys by Avian Ecology between 2022 and 2024. As such, the scrapes are not likely to be available over the entire period for which the Mersey Estuary SPA is designated as this includes the (spring and autumn) passage periods in addition to the winter months.

2.3.6 According to monitoring reports, creation and management of the surrounding grassland has been less successful, as is noted in the HCMG Year 5 monitoring report; extensive beds of nettles and thistles have established and therefore open grassland is not consistently present across most of the Cell during critical periods for dependent species. Some 'topping' of vegetation (i.e., active management) recently has reduced vegetation and further work is proposed; however, to date the grassland has not

functioned as intended throughout the passage and non-breeding seasons, and vegetation will also preclude nesting waders from using the Cell. This is considered likely be a consequence of dry ground conditions (see **Annex 3**) and high nutrient levels, and therefore there are limited opportunities to change this aside from continual vegetation cutting / topping. The grassland requires on-going management to improve conditions for use by SPA species; active management (topping of ruderal species and potentially spraying with herbicides) is likely to be necessary for the lifetime of the wind farm (to 2042).

2.3.7 It has been agreed by members of the HCMG that Cell 3 management is compliant with corresponding FWF planning conditions as it provides a low sward grassland with shallow wader scrapes and areas of seasonally open water, and the area has been observed as having benefited the target SPA species.

2.3.8 As such, the Year 5 HCMG report establishes the Cell 3 habitat baseline, which will be taken as that on which the Proposed Development shall provide additive mitigation.

Current Use of Cell 3 FWF Mitigation Area by SPA Birds

2.3.9 Peak and mean counts of pertinent SPA bird species are presented in **Table 2.1** and **Table 2.2**, derived from bird surveys as summarised in Section 1.3.

Table 2.1 SPA Bird Species and those part of the waterbird assemblage Recorded on the Cell 3 Wind Farm Management Area during Year 2.

Year 2			
Species	Peak count	Average count	Frequency Recorded (%)
Lapwing	800	162.2	50
Pintail	5	0.8	16.7
Curlew	59	16.2	58.3
Golden plover	433	80.1	33.3
Teal	291	81.8	50
Black-tailed godwit	1,411	193.6	41.7
Redshank	48	4	8.3
Shelduck	11	1.7	41.7
Wigeon	25	5.3	33.3
Greylag goose	8	1.7	33.3
Snipe	28	4.9	41.7
Mallard	42	7.8	25
Oystercatcher	2	0.2	8.3
Ruff	10	1	16.7
Shoveler	38	4.3	33.3
Gadwall	6	1.1	25

Table 2.2 SPA Bird Species and those part of the waterbird assemblage recorded on the Cell 3 Wind Farm Management Area during Year 3.

Year 3			
Target Species	Peak Count	Average Count	Frequency Recorded (%)
Lapwing	1,151	412.7	93.3
Pintail	13	1.1	20
Curlew	41	10.3	60
Golden plover	631	111.6	53.3
Teal	562	294.8	93.3
Black-tailed godwit	537	205.3	73.3
Redshank	6	0.5	13.3
Shelduck	7	0.7	20
Wigeon	169	33.5	40
Greylag goose	11	2.1	46.7
Pink-footed goose	131	8.7	13.3
Snipe	89	24.6	93.3
Jack snipe	1	0.1	6.7
Mallard	73	25.2	86.7
Oystercatcher	1	0.1	6.7
Ringed plover	1	0.1	6.7
Dunlin	9	0.6	6.7
Ruff	9	3.5	46.7
Mute swan	2	0.4	20
Shoveler	77	23.7	80
Gadwall	16	4.9	53.3
Tufted duck	8	1.5	26.7
Water rail	1	0.1	6.7
Marsh harrier	1	0.1	6.7

2.3.10 FWF HMCG reports include details of monitoring surveys undertaken for Years 1 to 5 (2021). However, the focus of surveys was on collision risk and therefore flight (vantage point) surveys only; detailed counts of bird usage of Cell 3 were not undertaken. It is relevant that the FWF HCMP did not include targets for bird numbers, nor was the mitigation area (ha) provided based on levels of usage at that time.

Efficacy of Cell 3 FWF Mitigation Area Management

2.3.11 Whilst Cell 3 attracts waterbirds in the winter months (when thistles / ruderal vegetation dies-off), it is evidently not used by passage birds (which are also a SPA feature), particularly in the autumn months as scrapes dry-up and ruderal vegetation is at maximum height. As such there is a temporal discord between the qualifying periods for which the Mersey Estuary SPA is designated (i.e., passage) and availability. This is due, in part, to the absence of a mechanism for retaining and controlling water, which is not a requirement of the FWF HCMP and the nature of the ground conditions (although some of the created scrapes have been lined in order to assist with water retention).

2.3.12 Cell 3 is reported to be meeting standards required in the Year 5 HCMG report, which states: *'With the continued cutting of vegetation in the cells, the planning condition is met however, it has been agreed with the HCMG that management needs to be reviewed, including grazing levels. Continued monitoring will be carried out in years 6-9 to ensure compliance with planning conditions.* It is

understood that there has been continued liaison between the operator of the wind farm and CWACC, and that ruderal vegetation management is on-going. Visits to Site in summer 2024 by Avian Ecology again confirmed the extensive presence of ruderal vegetation, albeit with some evidence of a reduction on previous years.

2.4 Canal Pools Area: Current Management and Use by SPA Birds

2.4.1 The Cell 3 Wind Farm Management Area is separated from the Manchester Ship Canal by a raised bund, which contains a linear series of linked ponds formally used for recreational fishing and understood to still be used informally for this purpose. These are commonly referred to as the Canal Pools (see **Figure 3**). This area sits outside of, but immediately adjacent to, the FWF Cell 3 mitigation area.

2.4.2 Part of the Canal Pools complex falls within the Mersey Estuary Site of Special Scientific Interest (SSSI) (**Plate 2**). The SSSI is designated for the same bird species as the SPA and therefore no additional consideration is afforded to the SSSI for the purposes of the ONBBMA.

2.4.3 However, as removal of the Canal Pools is proposed as part of the NBBMS (see Sections 3 and 4), consideration of current SPA bird-use is necessary and therefore surveys in 2023 / 2024 and 2024 / 2025 included counts of the canal pools.

2.4.4 Surveys were undertaken concurrently with those of Cell 3. **Table 2.3** summarises the relevant results of bird surveys, as derived from bird surveys as summarised in Section 1.3.

Table 2.3: SPA Bird Species Recorded on the Canal Pools 2023/25 (Year 2 and 3). Note surveys during year 1 were casual records but have been included.

Area within the NBBMA	Year	SPA/Ramsar qualifying features and components of the waterbird assemblage								
		Curlew	Black-tailed godwit	Redshank	Wigeon	Teal	Gadwall	Mallard	Oystercatcher	Common snipe
Canal pools	1	9	-	-	-	-				
	2	-	1	1	-	56	12	43	4	34
			Present 1/12 surveys	Present 2/12 surveys		Present: 5/12 surveys	Present: 3/12 surveys	Present: 8/12 surveys	Present: 3/12 surveys	Present: 6/12 surveys
	3	-	-	-	80	64	30	8	1	10
					Present 5/30 surveys	Present 7/30 surveys	Present 2/30 surveys	Present 4/30 surveys	Present 1/30 surveys	Present 6/30 surveys

2.4.5 Recreational access to the Canal Pools is not currently regulated. Regular presence of people using the Canal Pools has been noted during surveys but cannot be quantified. As the pools are largely elevated above Cell 3, it is highly likely that the fishing causes disturbance not only to the Canal Pools but also to Cell 3 (and the FWF mitigation measures), as people will be visible 'above the skyline' to birds using the surrounding land.

Plate 2: 'Canal Pools' area (within the marked blue line area) in relation to Mersey Estuary SSSI (green hatched).

2.4.6 Some of the Canal Pools have been colonised by non-native New Zealand pigmy weed *Crassula helmsii* (NZPW). This is an invasive, non-native, largely aquatic injurious weed species is listed on Schedule 9 of the WCA (1981) and can easily and rapidly spread. It forms dense mats on water bodies that shade out other aquatic vegetation, consequently having a negative impact upon fish and invertebrate communities. These mats of vegetation can impede drainage and lead to flooding, and out-compete other aquatic vegetation. Severe oxygen depletion can also occur in the water under dense growths of NZPW.

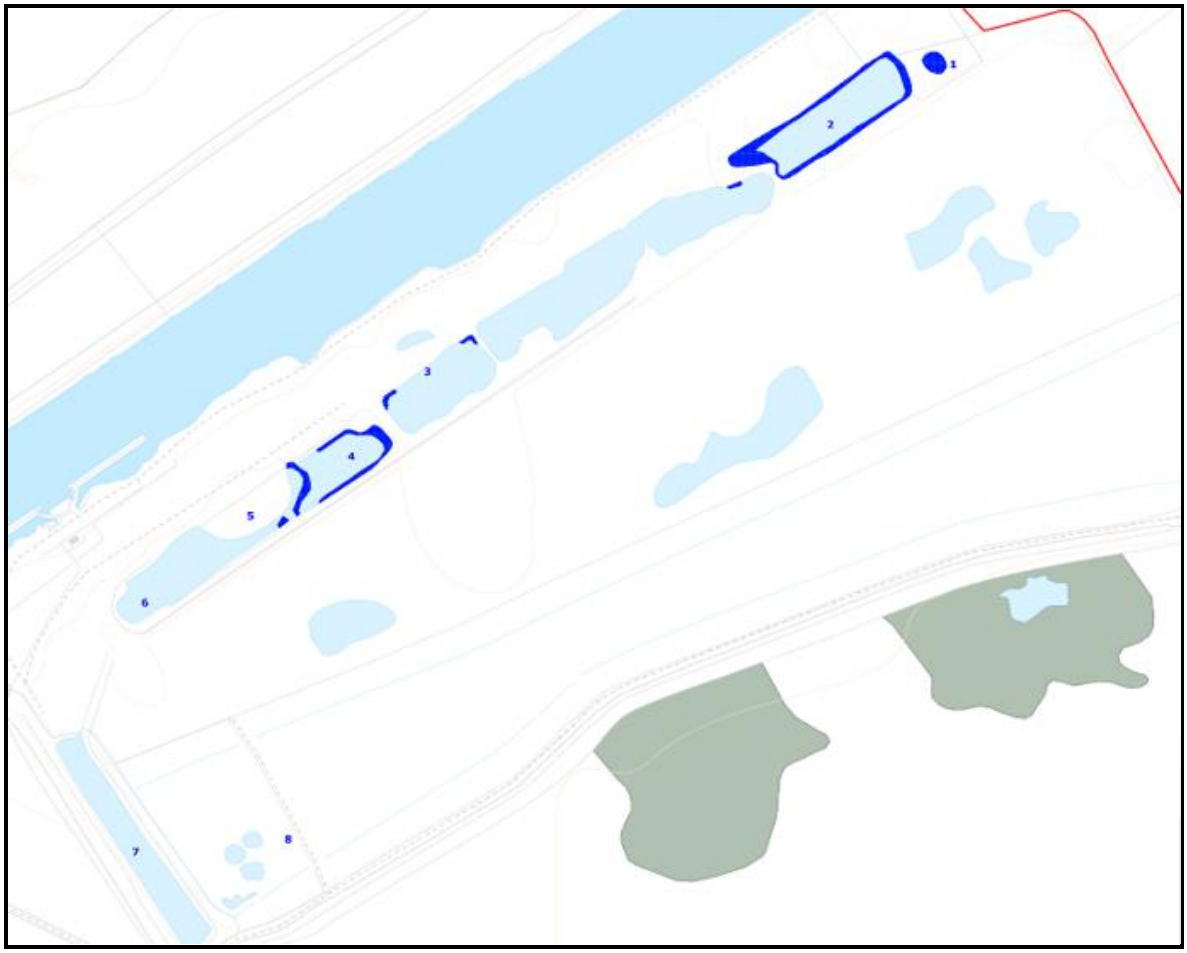
2.4.7 The extent of NZPW within the Canal Pools and NBBMA was mapped by Avian Ecology in summer 2023, as presented in **Plate 4**. It can reasonably be assumed that, without treatment and preferably eradication, there is a high risk that NZPW will in time be spread to other waterbodies, potentially including the scrapes created as part of the Frodsham Wind Farm mitigation strategy, as well as Cell 6 (i.e., the main wetland bird area of Frodsham Marsh) and the wider ditch network. As such the presence of NZPW represents a substantial threat to birds and wildlife using Frodsham Marsh.

2.4.8 The Canal Pools are not currently under the ownership or control of the Applicant for the Proposed Development. Use of Cell 3 and the Canal Pools as part of the NBBMA is contingent on approval of the Development Consent Order. As such the Applicant cannot currently implement measures to treat NZPW.

2.4.9 There is no legal requirement for the removal of injurious weeds by landowners, however The Weeds Act 1959 and the Wildlife and Countryside Act 1981 oblige landowners to prevent their spread.

2.4.10 Measures to ensure the prevention of spread of NZPW will be implemented during the construction of the NBBMA (see Section 4.2), and which are included in the **Outline Construction Environmental Management Plan [EN010153/DR/7.5].**

Plate 4: Extent of NZPW on Canal Pools (marked in dark blue). Summer 2023.



2.5 Cells 1, 2 and 5: Current Management and Use by SPA Birds

2.5.1 Cells 2 and 5 comprise grazed pasture, with patches of extensive ruderal vegetation cover at times. These are managed specifically for grassland-associated species, namely golden plover, lapwing and curlew, in accordance with the Habitat Creation and Management Plan (HCMP).

2.5.2 Cell 1 forms part of the wider Site not managed for mitigation of the Frodsham Wind Farm (FWF). It is managed by wildfowlers for shooting purposes and, together with adjoining arable land, falls within the Solar Array Development Area (SADA).Peak and mean counts of pertinent SPA bird species recorded across Cells 1, 2 and 5 and the eastern extent of the SADA are presented in Table 2.4, as derived from bird surveys summarised in Section 1.3.The wider Site (including Cell 1 and adjoining arable areas- eastern extent/array) is evidently used less by SPA species, which is consistent with Natural England mapping of FLL (FLL). Nevertheless, usage levels have informed the design of the NBBMA, and bird numbers recorded in these areas are included in the Bird-day calculations presented in Annex 1.

Table 2.4: SPA Bird Species Recorded on the Cells 1, 2 and 5 and the eastern extent/array (the SADA) from year 1 to year 3.

		Peak Count				Average Count				Frequency Recorded (%)			
	Species	SADA (includes Cells 1, 2 and 5 and the eastern extent)	Cell 1 (as part of the SADA western extent)	Cell 2 (as part of the SADA)	Cell 5 (as part of the SADA)	SADA (includes Cells 1, 2 and 5 and the eastern extent)	Cell 1 as part of the SADA)	Cell 2 as part of the SADA)	Cell 5 as part of the SADA)	SADA (includes Cells 1, 2 and 5 and the eastern extent)	Cell 1 as part of the SADA)	Cell 2 as part of the SADA)	Cell 5 as part of the SADA)
Year 1	Lapwing	159	159	-	-	12.1	11.1	-	-	21.1	15.8	-	-
	Curlew	27	9	27	22	5.3	0.8	2.6	1.7	26.3	15.8	21.1	15.8
	Golden plover	9	-	9	-	0.5	-	0.5	-	5.3	-	5.3	-
Year 2	Lapwing	450	280	450	5	114.2	40.5	73.3	0.4	41.7	33.3	33.3	8.3
	Curlew	90	70	90	-	27.8	6.7	21.1	-	75	25	58.3	-
	Golden plover	200	37	200	-	32.3	5.9	26.4	-	33.3	16.7	25	-
Year 3	Lapwing	67	244	200	13	8.4	22.3	32.7	1.2	46.7	40	53.3	20
	Curlew	-	45	37	-	-	6.9	15.3	-	-	33.3	60	-
	Golden plover	-	23	60	-	-	1.5	6.5	-	-	6.7	13.3	-

Other Data Sources

2.5.3 Data has also been acquired from the British Trust for Ornithology (BTO) and the Cheshire and Wirral Ornithological Society (CAWOS). A review of the baseline ornithology reports (and survey results therein undertaken between October 2021 and February 2022 and 2024) which supported the HyNet Carbon Dioxide Pipeline DCO (CWACC Planning Ref: 22/04113/NIP) was also undertaken; however, data from these surveys was not considered appropriate for use in bird-day calculations due to differing survey areas.

BTO Wetland Bird Survey (WeBS) data

2.5.4 Parts of the Site comprise a 'core count area' for the BTO's coordinated monthly counts. The count area includes parts of the Site (**Plate 3**).

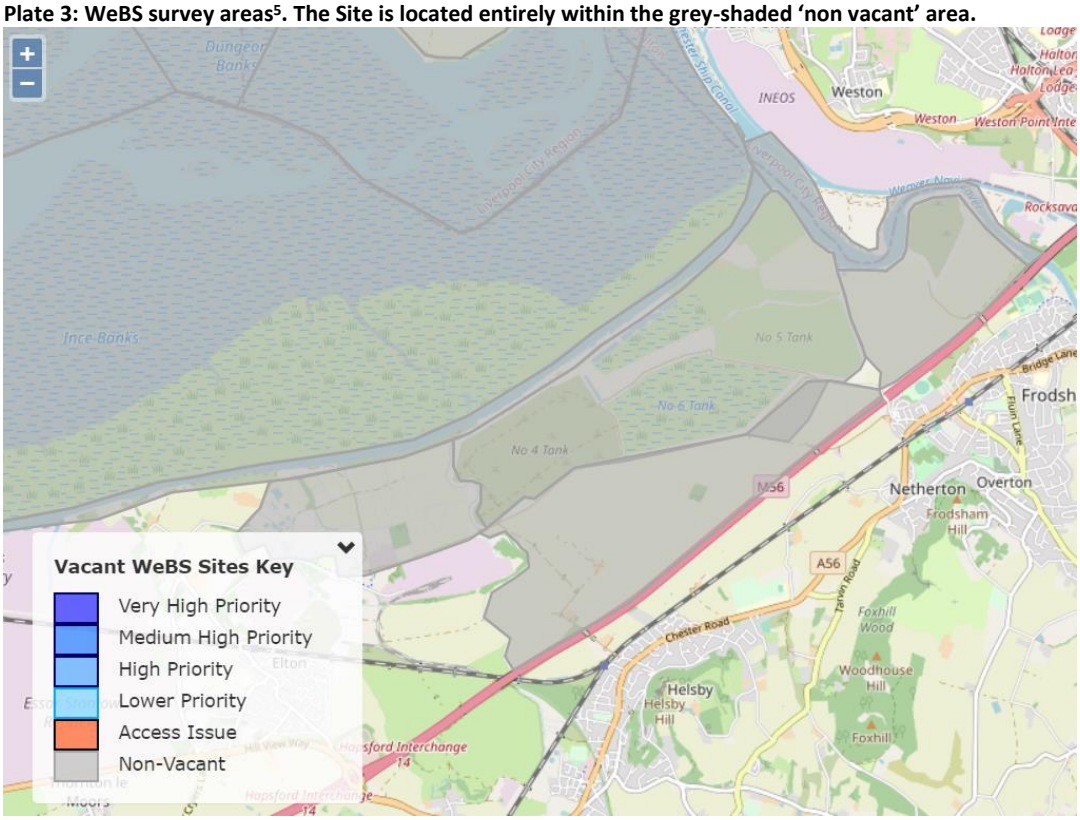
2.5.5 The BTO was contacted in July 2023 for data relating to the area referred to as 'Frodsham Sludge Lagoons' (Sector 45351) covering the most recently available 5-year period (up to June 2022).

2.5.6 BTO peak counts of golden plover, curlew and lapwing are presented in Table 2.5. However, it must be noted that the BTO count sector includes Cell 6, which is outside the Site and consistently supports large numbers of wetland birds as it is the only operational Cell. As such, it is not possible to distinguish Cell 6 records from those within the Site. BTO data does not therefore provide clarification on the extent of use of the Site by SPA species and therefore cannot be used as the basis for determining the extent (area in ha) of mitigation required for the Proposed Development.

Table 2.5: Key SPA Bird Species (BTO 5-year peak and average counts)

SPA Species	Peak Count across BTO WeBS Sector 45351 Frodsham Sludge Lagoons	Average across BTO WeBS Sector 45351 Frodsham Sludge Lagoons	Peak count across BTO WeBS Sector45424 Weston Marshes	Average count across BTO WeBS Sector45424 Weston Marshes
Qualifying Species				
Golden Plover	1,200	87.28	-	-
Assemblage Species				
Eurasian Curlew	340	41.04	-	-
Northern Lapwing	2,000	267.2	130	3.62

Plate 3: WeBS survey areas[5]. The Site is located entirely within the grey-shaded 'non vacant' area.



CAWOS Data

2.5.7 CAWOS were contacted in July 2023 to obtain records of SPA species at Frodsham Marsh. An extensive data set was supplied; however, many records could not be attributed to specific locations (and therefore the Site). It is relevant that CAWOS data presents casual observations, as submitted by local birdwatchers. It therefore excludes 'null' records where a species was not recorded which is an important component of formal bird counts used for ecological assessment purposes. As such, this data does not provide any detail on the frequency of occurrence relative to the number of visits made.

2.5.8 Subsequently CAWOS data does not provide clarification on the extent of use of the Site by SPA species and therefore cannot be used as the basis for determining the extent of mitigation required (area in

[5] From https://app.bto.org/websonline/sites/vacant/vacant-sites.jsp#lon=-2.7401353&lat=53.2943786&zoom=13 [accessed May 2024]

ha). A summary of CAWOS peak count records of golden plover, curlew and lapwing are presented in Table 2.6.

Table 2.6: SPA Bird Species (CAWOS peak counts)

SPA Species	Cell 1	Cell 2	Cell 3	Cell 5
Qualifying Species				
Golden Plover	700	1,000	750	1,563
Assemblage Species				
Eurasian Curlew	80	275	40	100
Northern Lapwing	500	2,200	1,100	500

2.6 Determining the Extent of Mitigation Required

2.6.1 Additive mitigation requires the provision of mitigation for the Proposed Development in addition to those already and/or potentially implemented as part of the FWF mitigation strategy.

2.6.2 The wider Site is evidently little used by SPA Species, in line with NE mapping of FLL. Regardless, levels of use for the entire Site are included in the Bird-day calculations presented in **Annex 1**.

2.6.3 There is no set-formula to determine an area of land which provides adequate mitigation for effects on wetland birds. Subsequently the approach must be agreed through a combination of quantitative and qualitative assessment and discussion with key stakeholders. Smaller areas of high-quality and well-managed habitat are likely to achieve better outcomes than larger poor-quality habitats or fragmented locations, and so professional judgement is inevitably required. The Applicant has consequently engaged with Natural England, CWACC and RSPB regarding SPA bird mitigation throughout the pre-submission phase of the Proposed Development; details of these discussions are presented in **ES Vol 2 Appendix 8-2: Consultation and Engagement [EN010153/DR/6.2]**.

2.6.4 The Proposed Development includes the installation of solar panels and associated infrastructure on Cells 2 (partial cover) and Cell 5, which are both currently managed as grassland for curlew, lapwing and golden plover. It is therefore assumed that the Proposed Development will lead to the complete displacement of these species from Cells 5 and most of Cell 2. SPA species will also be displaced from the wider Site, including Cell 1 and agricultural farmland away from the Cells.

2.6.5 A key focus of NBBMS is in relation foraging habitats for curlew, lapwing and golden plover, i.e., those SPA species which regularly utilise grassland habitats and for which FWF provides mitigation. Cells 2 and 5 currently provide a combined total of 31.05ha of managed grassland for these species. The FWF management area of Cell 3 (i.e., excluding the Canal Pools) is approximately 39.7ha in extent. Accordingly, in relation to land managed for SPA species, FWF currently provides 71.2 ha of habitat.

2.6.6 To calculate the likely area of habitat required to support displaced SPA species from the entire Site as a result of the Proposed Development, the approach used for the consented Cleeve Hill NSIP Solar Park (termed 'Cleeve Hill approach') in Kent (May 2020) (and agreed by NE as appropriate) has been referenced. This quantifies current use of a Site by SPA species based on usage levels; numbers of birds and frequency of presence relative to physical area (ha). 'Bird-days' are therefore defined as the numbers of birds supported by each hectare of habitat over time; i.e., the theoretical area of habitat required to fully mitigate a loss of habitat for each relevant species. It should be noted, however, that the approach calculates physical area only and makes no provision for habitat quality. As such it provides a precautionary guide and should not be taken as an absolute area requirement where habitat improvements are implemented.

2.6.7 Calculations to determine the number of SPA birds displaced by the Proposed Development were based on survey data gathered by Avian Ecology Ltd, supplemented by historic data from the RSK surveys, the BTO and CAWOS, as presented in Section 1.2. Peak Counts per month have been combined using data from across the Site, as presented in **Annex 1**. Peak counts of each species across the entire Site / survey area were aggregated per survey to represent a worst-case scenario. For example, lapwings observed using adjacent fields or survey cells (within the Site boundary) were combined to produce the highest possible count for assessment purposes.

2.6.8 Following the Cleeve Hill approach, the amount of mitigation area that would be required to provide sufficient grassland habitat for golden plover, lapwing and curlew is calculated to be 63 ha. This is the results of the most complete survey data set covering the Site over the non-breeding period (September 2023 to March 2024) and thus represents a precautionary but realistic approach. Calculations are presented in **Annex 1**. This includes provision for numbers of birds using the entire Site of the Proposed Development; i.e., Cells 1, 2, 3, 5 and the wider farmland within the Order Limits.

2.6.9 Optimal conditions to provide the highest quality foraging resource for golden plover, lapwing and curlew are damp grassland (generally known as grazing marsh) with appropriately managed sward; this approach was adopted at Cleeve Hill, where grazing marsh was provided as a key part of a programme to mitigate comparable effects as anticipated to occur under the Proposed Development, i.e., the loss of FLL used by qualifying species. Cleeve Hill is located adjacent to The Swale SPA, which supports a very similar assemblage of species to the Mersey Estuary SPA. Effects arising from the Cleeve Hill development and the Proposed Development, i.e. loss of FLL due to the development of a solar farm, are also the same. As such, the Proposed Development is directly comparable to Cleeve Hill.

2.7 Use of Cell 3 as a Mitigation Area for the Proposed Development

2.7.1 Existing mitigation measures within Cell 3 for FWF include a series of scrapes, a bund in the south-east and two excavated areas in the south-east and south, with grazed (unspecified) grassland being the main habitat type. These are illustrated in **Figure 2**. Current levels of usage have been established through extensive baseline data gathering, and it is considered that measures implemented for FWF mitigation are operating as required pursuant to Condition 34 of the FWF planning conditions. Subsequently consideration of the use of Cell 3 for mitigation is based on robust data and a clear understanding of existing measures, including any potential for improvement.

2.7.2 To fully understand the existing habitats on Cell 3 and establish the potential for the creation of optimum habitats, Ground Investigation (GI) works have been undertaken by the Applicant.

2.7.3 Details of GI works are presented in **Annex 3.** The GI concludes that optimal wet grassland and scrapes could only be provided in Cell 3 if the cell is re-engineered to retain water, and that a source of water is made available to manage water levels favourably. Current ground conditions and elevations preclude any additional water retention measures or wet grassland creation as the surface layers of the cell comprise sandy deposits which do not readily retain water. The GI has identified layers of low permeability material at depths of approximately 0.8m below ground level, where perched water has been recorded. As such it is evident that, with appropriate engineering and management, there are substantial opportunities to create higher quality habitat within Cell 3 than currently does or could exist, and for which there is no current mechanism of delivery.

3 ONBMS OVERVIEW

3.1.1 Measures proposed under the ONBBMS are illustrated in **Figure 3a (Option A)** and **Figure 3b (Option B)**.

3.1.2 To create the NBBMA two options are being proposed. For both options, it would be necessary to re-engineer the soils within Cell 3, excavating soils within the central area of Cell 3 to lower the ground level and expose the low permeability soils buried beneath the existing sandy surface layer.

3.1.3 Option 1 (Figure 3a) would involve placing some of the excavated soils from Cell 3 into the ponds to the north of Cell 3, creating an additional area of grassland. Some of the soils would also be placed around the perimeter of Cell 3 and engineered to direct surface water towards the central area thereby helping to maintain a wet grassland habitat. A new water storage area / pond would be created within the bund to the north of Cell 3 that would act as a reservoir to help manage water levels within the NBBMA.

3.1.4 Option 2 (Figure 3b) would involve retaining all of the excavated soils within Cell 3, placing all of the material around the perimeter of Cell 3, and again directing surface water towards the central area of the cell. The existing ponds would act as a reservoir to help manage water levels within the NBBMA.

3.1.5 Both options would involve a New Zealand Pigmy Weed control strategy.

3.1.6 Two options are presented as there may need to be flexibility on where soils are moved within Cell 3 and how this is undertaken, which would be determined as part of permitting approach discussions with the Environment Agency. Both Options would deliver on the objectives of the NBBMS to mitigate the predicted impacts of the Proposed Development and be additive to measures in place for FWF.

3.1.7 The total area included in the ONBBMS includes Cell 3, the Canal Pools area and additional fields to the northeast of Cell 3, which total 53.31 ha. **Table 3.1** presents the habitat types proposed within the ONBBMS area based on Option 1.

Table 3.1: NBBS Proposed Habitat Components (assuming Option 1). Text in italics identifies habitat features located within the 16.2 ha area identified through Site Investigations as suitable for water storage and therefore could support scrapes and wet grassland (see paragraph 3.1.10).

Habitat	Area (ha)
Existing Scrape (FWF mitigation)	*2.71*
Proposed Additional Scrape	*3.31*
Proposed Island	*0.67*
Existing Drain	0.92
Proposed Water Storage Area	1.06
Proposed Wet Grassland Area	*9.52*
Proposed Grassland	28.44
Raised Bank with Grassland (Canal Pools area)	6.11
Proposed Grassland (Trees to be Removed)	0.57
Total NBBMS Area	**53.31**

3.1.8 In terms of mitigation, the primary aim of the ONBBMS is to deliver mitigation for the loss of land within the entire SADA for SPA species, through the provision of higher quality and managed habitat in the NBBMA. This includes the displacement from Cells 2 (partial) and Cell 5 of foraging curlew, lapwing and golden plover (the FWF mitigation), but also includes mitigation and enhancement for all other SPA species recorded across the entire Order Limits. Habitats within Cell 3 and which are regularly used by SPA qualifying species will be subject to temporary loss whilst capital works are undertaken (see Section 3.2).

3.1.9 Bird-day calculations demonstrate that 63 ha of grassland would be required to support existing levels of use by SPA species (Annex 1); however, this does not account for higher quality wet grassland (i.e. improved habitats[6]).

3.1.10 Under Option 1, The NBBMS provides for a total of 44.64 ha of grassland overall, of which 9.5 ha will be actively managed as wet grassland. Under Option 2, the overall areas are reduced to 38.53 ha of grassland but still includes 9.5 ha of wet grassland. Both Options are considered to provide at least a comparable foraging resource for these species through improved quality and will also be available for the entirety of the non-breeding season (i.e., including passage periods) as a result of the creation of wet grassland areas and the new measures to enable active water management within the cell.

3.1.11 It is anticipated that the NBBMA, with appropriate, large-scale re-engineering to enable control of water levels, and appropriate continued management, will support a higher number and increased diversity of Mersey Estuary SPA species than under current management, and also over a longer time-period of time, than is possible from the mitigation measures provided by FWF mitigation. Wet pasture, in particular, creates conditions what increase the abundance and accessibility of invertebrate species which form the primary food source for most wader species. Such conditions will enable the NBBMA to provide substantially higher resources than is currently the case and is also due to cease in 2042. The modified management regime and improved design of this area will also provide additional benefits to an array of SPA species and likely to breeding waders and extend the management of the NBBMA by 28 years.

3.1.12 The SI, as provided in **Annex 3**, identified moderate to high levels of permeability within the upper metre of made ground, with ground water present at depths of 0.8 to 2.0 m below ground level. Groundwater was perched on a layer of black clay, thought to be deposited within the cells at depth due to the differentiated settlement of finer clay particles compared to the coarser silts and sands. This indicates that re-engineering the cells so the lower permeability clays are closer to the surface could deliver a wet soil at the surface, and therefore wet grassland could be created.

3.1.13 This information has enabled the design to be capable of holding sufficient water such that it would be possible to provide substantial wet grassland areas, along with additional scrapes and associated muddy edge habitats.

3.1.14 Based on the SI works, at least 16.2 ha of Cell 3 is anticipated to be available for use in the creation of wet grassland, existing scrapes and new scrapes with islands, as presented in Table 3.1 and shown on **Figure 3**.

3.1.15 This evidence-based approach is considered to provide the necessary confidence that the proposed works would deliver significant betterment to Cell 3 (as the main part of the NBBMA), and therefore additive mitigation will be achieved.

[6] E.g., see https://defrafarming.blog.gov.uk/manage-lowland-wet-grassland-for-birds/

3.2 Duration and Timing of Works

3.2.1 For the purposes of this ONBBMS, the overall programme for works within the NBBMA is considered on the assumption that Option 1 (removal of the Canal Pools) is implemented. Option 2, should that be taken forward, would require an overall shorter works duration, albeit only marginally.

3.2.2 Works for Option 1 are anticipated to require a maximum of nine months from commencement to completion and may be completed within 6 months. To ensure that habitats within the Site are available for SPA species throughout the construction period, the following approach will be adopted:

(1) There will be no other construction works within Cells 1, 2 or 5 until construction of the NBBMA within Cell 3 and the Canal Pools area are complete and functional.

(2) Works within Cell 3 and the Canal Pools will commence in early March (subject to ground conditions). This will minimise displacement over the construction period to no more than a few months, as work will predominantly be undertaken outside the winter season (i.e., the core non-breeding season for overwintering SPA qualifying species). Commencement in March will also ensure that breeding species are not subject to disturbance. An Ecological Clerk of Works (ECoW) will be engaged to ensure that breeding birds are protected in accordance with relevant legislation (see **Outline Construction Environmental Management Plan [EN010153/DR/7.5]**).

3.2.3 As a primary function of the NBBMA is to provide shallow wetland areas with muddy margins, which will be available for use by waterbirds immediately on completion of construction, it is considered that the NBBMA will be functional for SPA birds immediately on completion of earthworks and removal of any construction compounds etc., located within the NBBMA. As such mitigation would be available in advance of any construction on Cells.

3.3 Main Components of the ONBBMS

3.3.1 The ONBBMS provides mitigation of effects arising from the Proposed Development through:

(1) Provision of habitat which ensures at least current levels of on-site resources are available for curlew, lapwing and golden plover and all other Mersey Estuary SPA species, through the delivery of higher quality foraging habitats (particularly wet grassland and scrapes);

(2) Extending the seasonal availability of existing mitigation in the NBBMA to include the autumn passage and spring passage periods for waterfowl and waders. This will be possible by reducing soil permeability and providing using water from a dedicated water source;

(3) Extending conservation management of the NBBMA by an anticipated 28 years (this assumes a 40-year period of operation of the Proposed Development from 2030, with the FWF decommissioning required in 2042); and

(4) On-going dynamic management of all mitigation for the Proposed Development and FWF.

3.3.2 The ONBBMS provides additional benefits (enhancements) for Mersey Estuary SPA species through:

(1) Provision of foraging habitats for SPA species through the creation of additional scrapes with extensive wet edges;

(2) The inclusion of island features to provide high-tide and safe roosting opportunities for SPA species;

(3) Provide improved foraging opportunities for winter and passage SPA species through control of water levels (i.e., ensuring grassland and scrapes remain wet under normal conditions);

(4) Preventing and/or managing encroachment of NZPW across the wider Frodsham Marsh Area (such as Cell 3 FWF mitigation scrapes and Cell 6);

(5) Re-engineering of soil, with re-seeding of grassland and subsequent control of grazing/mowing regime will remove the existing seedbed and therefore solve on-going issues of ruderal vegetation encroachment;

(6) Removal of a small stand of semi-mature trees adjacent to the Canal Pools, thereby increasing the attractiveness of surrounding habitats to grassland waders (SPA species) and breeding waders through increasing open aspects adjacent to the SPA, and reducing predator opportunities;

(7) Reduced disturbance of SPA species through the removal of uncontrolled recreational fishing of the Canal Pools; and

(8) On-going dynamic management of all enhancement measures within the NBBMA. This will include conservation focussed grazing (or cutting) management across the NBBMA throughout the lifetime of the Proposed Development (with the cessation of the current grazing lease).

3.3.3 The ONBBMS provides beneficial measures for breeding waders of conservation concern through:

(1) Breeding season availability of wet grassland / scrapes, using water from a dedicated water source;

(2) The installation of predator exclusion measures around the perimeter of Cell 3 (e.g. fencing or ditches);

(3) Removal of the stand of semi-mature trees (as above), which will reduce perching and nesting opportunities for avian predators; and

(4) Reduced disturbance of breeding species through the removal of uncontrolled recreational fishing of the Canal Pools (as above).

3.3.4 Whilst not the primary focus of management of the NBBMA, the measures proposed will provide substantial enhancements for a wide range of other faunal species such as, but not limited to, water voles, European eels and amphibians.

3.3.5 The NBBMS will be subject to dynamic conservation focussed management throughout the 40-year operational lifetime of the Proposed Development, and which will be funded accordingly by the Applicant or any subsequent operators.

3.3.6 The following sections detail the management prescriptions for achieving the objectives outlined above, which are summarised as:

Aim 1: Creation of Wetland Habitats, and Enhancement of Grazing Habitats

Aim 2: Removal or Treatment of NZPW and Creation of Additional Grassland

Aim 3: On-going Dynamic Habitat Management

3.3.7 Details of each Aim are presented in Section 4.

4 ONBBMS AIMS AND OBJECTIVES

4.1 Aim 1: Creation of Wetland Habitats, and Enhancement of Grazing Habitats

4.1.1 Cell 3 and the adjacent Canal Pools area will be entirely re-engineered to ensure water can be retained and managed, as follows:

(1) Existing scrapes (provided as part of the FWF mitigation) will be temporarily removed and then re-instated as part of a wider, increased wetland network.

(2) Additional scrapes will be created, substantially increasing the amount of 'muddy edge' to provide foraging habitat for SPA species.

(3) Islands will be created to provide safe roosting locations for SPA species and nesting birds.

(4) The NBBMA will be managed as grassland, with approximately 9.5 ha of managed wet grassland (**Figure 3**). Note this area excludes those marked as scrapes and islands and is provided on an indicative basis; precise water levels (and therefore wet grassland extent) will vary depending on conditions and may be actively managed at different levels through the year to suit species.

(5) The Canal Pools area will be either:

(a) Option 1: removed entirely to provide additional grassland and create a raised water storage area[7] which will be used to manage water levels on Cell 3, or

(b) Option 2: retained but re-engineered and used as a water source to manage water levels on Cell 3 (following the eradication or management of NZPW; see Section 4.2).

(6) The NBBMA will include predator exclusion measures with the aim of assisting breeding wader productivity. This will further prevent human access to the NBBMA.

4.1.2 The above measures are illustrated on **Figure 3**.

Landscaping & Hydrological Management

Creation of Impermeable Substrate

4.1.3 Details are presented in **Annex 3**; however, SI works have confirmed that a low permeability surface of approximately 16.2 ha can be created within Cell 3. Of this, approximately 6.7 ha is proposed to be scrapes and islands (permanent / semi-permanent water features), with the remainder (9.5 ha) managed as wet grassland.

Creation of additional water feature habitats within Cell 3

4.1.4 It is proposed to create the network of water features throughout Cell 3. Water will be diverted from a newly created water storage area on the Canal Pools area into the centre of Cell 3 and onwards to a created network of scrapes, swales, bunds and hollows (as shown in **Figure 3**). Water will move

[7].This is currently anticipated the approximately 14,000m^2, but shallow (i.e.<1m). This equates to just under 10,000m^3 volume, so below the 25,000m^3 required by the Reservoir Act 1975.

through the network and be allowed to be retained within Cell 3 to keep the habitats wetter, for a longer period.

4.1.5 Scrape design criteria are set out in Section 2 of the '*Cell 3 Scrape and Wetland Design'* report (Atmos Consulting, 06 June 2014) and the same approach will be broadly applied for any additive water habitats. The key criteria being the creation of extensive 'edge' features and therefore variable depths would be required.

4.1.6 Existing scrapes, managed as part of the FWF mitigation, occupy an area of approximately 2.71 ha. These locations will be recreated (following re-engineering of the Cell), with an additional 3.31 ha of permanent / semi-permanent scrape. The new water features will also include three shallow domed islands, which will provide roosting and breeding opportunities for SPA and wetland species.

4.1.7 Further details are presented in **Annex 3**.

Creation of Water Source for On-going Management

4.1.8 Water source will depend on the required treatment of NZPW (see Section 4.2). Two options are under consideration:

(1) Removal of the Canal Pools; or

(2) Retention of the Canal Pools

4.1.9 Under Option 1, the Canal Pools will be removed to ensure NZPW is eradicated and will then be replaced by a newly created area of grassland and a water storage area. This will be used to ensure Cell 3 can be optimally managed for key species, through the installation of sluices between the raised Canal Pools area and the Cell bed. NZPW present in the ponds will be treated and buried in accordance with best practice guidance.

4.1.10 Option 2 – retention of the Canal Pools as a water source for Cell 3 following treatment of NZPW and provision for ongoing monitoring and management of NZPW.

Provide improved foraging opportunities for winter and passage SPA birds through control of water levels

4.1.11 Control of water levels will optimize conditions for SPA species; ensuring water can be moved on to the Cell (through water inundation from the created water storage area and sluice gates) in the drier months. This will extend existing resources over the passage period, as well as the winter months. This will require specific active conservation management of the NBBMS area.

Management of Grassland Areas for Golden Plover, Lapwing and Curlew

4.1.12 Areas of conventional (dryer) grassland within Cell 3, on the Canal Pools and on land to the northeast of Cell 3 (see **Figure 3**) will be managed in accordance with the current prescriptions of the FWF Cells 2 and 5 mitigation, i.e., by ensuring a favourable short sward is available in the period October to March (inclusive). Existing grazing management (under the current grazing lease) will be ceased and replaced by conservation focussed grazing (or cutting) management.

4.1.13 An isolated stand of semi mature trees (**Figure 3**) will be removed from the area to the east of the Canal Pools. This will remove opportunities for predators and allow grassland wader species to utilise this area for foraging, which is not currently the case.

Provide opportunities for breeding waders through breeding season retention of wet grassland / scrapes

4.1.14 The ability to release water onto the Cell (through water inundation from the created water storage area) and retain it through the spring and summer months would be highly beneficial to breeding waders, particularly when combined with predator fencing.

4.1.15 Predator fences are known to provide good protection to nesting waders[8].The entire Cell 3 and the Canal Pools area will be surrounded by predator fencing, or other suitable predator exclusion method e.g. provision of perimeter ditches, to prevent predatory species like fox entering the Cell and potentially predating roosting, foraging and/or nesting birds (or eggs/chicks). The precise location of predator fencing / ditches will be determined through further detailed design and in consultation with key stakeholders; however, it is envisaged to encompass the entirely of Cell 3 and the Canal Pools area. Predator fencing / ditches will be subject to on-going checks to ensure integrity is maintained over the entire operational lifetime of the NBBMA.

4.2 Aim 2: Removal and/ On-going Treatment of NZPW and Creation of Additional Grassland

4.2.1 NZPW is an invasive, non-native, largely aquatic Schedule 9 of the WCA (1981) species which has infested some of the Canal Pools (see **Plate 4**). Part of these pools are within the Mersey Estuary Site SSSI, as such, any works to control NZPW at the locality will be detailed in the full NBBMS produced post DCO consent (as the DCO will disapply the need for obtaining a separate SSSI consent under the Wildlife and Countryside Act 1091.

4.2.2 NZPW is notoriously difficult to remove and filling-in of waterbodies is often the only option to facilitate eradication[9]. As such, in-filling is the preferred option. However, if this is not possible then on-going management of NZPW will be undertaken over the lifetime of the Proposed Development and measures implemented under the full NBBMS (40 years).

Option 1: In-filling of the Canal Pools

4.2.3 As part of the ONBBMS, the Canal Ponds may be filled in with excavated materials from landscaping works in Cell 3. This will provide two benefits:

- The eradication of NZPW, thereby preventing further spread to the existing habitats within Cell 3 and wider Frodsham Marsh (Cell 6 in particular), as well as those proposed as part of the NBBMP. Should these water features become infested with NZPW the ornithological value of the entire Frodsham marsh area will be substantially compromised.

- Creation of 6.11ha of additional grassland (on land currently occupied by the Canal Pools), which will be managed for the benefit of golden plover, curlew and lapwing.

4.2.4 The removal of uncontrolled fishing activities from the Canal Pools will additionally serve to reduce or remove existing disturbance from Cell 3, which is considered a benefit of this ONBBMS. It is anticipated that that driven access to the Canal Pools by fisherman will be ceased (i.e., padlock change on the existing gate close to Marsh Farm). Signage and/or fencing may be installed to deter unauthorised access.

[8] https://community.rspb.org.uk/ourwork/b/science/posts/fencing-for-safeguarding-waders [Accessed May 2024].
[9] See https://canalrivertrust.org.uk/things-to-do/canal-and-river-wildlife/canal-and-river-invasive-species/new-zealand-pigmyweed [accessed May 2024]

4.2.5 Once removed water storage area to be created. This will be used as a source of water for the main mitigation areas, within Cell 3.

Option 2: On-going NZPW Management

4.2.6 In the event that Option 1 cannot be pursued, for example due to permitting limitations, the Canal Pools will be retained and used as a source of water for the newly created wet grassland in Cell 3 once NZPW management is implemented and there is no risk of spread.

4.2.7 The preferred approach would be to eradicate NZPWM entirely. An appropriately experienced specialist contractor would be engaged in order to determine the likely most effective approach to eradication and on-going management. Continual management of NZPW across the NBBMA, using best practice measures as identified at the time, will be undertaken for the entire 40-year management period.

4.3 Aim 3: On-going Dynamic Management

4.3.1 On-going conservation management of Cell 3 will be secured through an appropriate legally binding mechanism.

4.3.2 Management measures will remain in place for the lifetime of the Proposed Development. All costs associated with on-going management will be borne by the Applicant.

4.3.3 It is intended that the NBBMA will be managed by an independent, suitably experienced and reputable conservation body and positive initial discussions have been held with RSPB in this regard, with discussions on-going. Management will be separated from that undertaken in the SADA or wider Site (i.e., all areas of the Site excluding the NBBMA). If agreement with a conservation body cannot be reached, suitably qualified and experienced personnel will be employed and / or contracted-to by the Applicant.

4.3.4 Management will require regular visits and dynamic action, based on conditions at the time. As such management will be on-going, requiring regular visits and (where necessary) actions throughout the year. Management actions will include, but not be limited to, control of water levels, livestock grazing (or cutting), island maintenance and the general upkeep of the NBBMA to ensure the Aims and Objectives of the NBBS are met.

4.3.5 Measurable targets will be set to ensure the NBBMA is functioning effectively and reaching the stated aims and objectives. As bird populations fluctuate and are subject to numerous environmental factors which are outside of the control of the Applicant, it is envisaged that measurable targets will be based on extent of habitat area and hydrological function. The inclusion of measurable targets will ensure that the NBBMS Aims and Objectives are clearly met.

4.3.6 Hydrological management of Cell 3 will be necessary to create and maintain a mosaic of dry and wet grassland with shallow areas of surface water, pools and scrapes, so as to ensure good nesting habitat and attractive foraging areas are present throughout the breeding and non-breeding season (including passage periods) for waders and wildfowl. This will be provided broadly as follows:

- Spring: A high-water table is proposed, to ensure the soil is soft enough for breeding wading birds to probe for earthworms and larvae during passage and breeding seasons;
- Early summer: The area of damp ground will be reduced, with some areas of high-water table remaining to provide feeding areas; and,
- Winter/Passage: damp fields with areas of surface flooding to support the desired grassland sward structure.

4.3.7 The re-engineering of Cell 3 (see **Figure 3**) will ensure that at least 16.2 ha of the Cell area is able to hold water and therefore a high water-table can be maintained when there is sufficient water available. The use of water from the Canal Pools (Option 2) or creation of a water storage area (Option 1) will allow water levels in Cell 3 to be actively managed when sufficient rainfall is not available to achieve the desired seasonal water level.

Setting Measurable Targets

4.3.8 Measurable Targets on which to determine the success of the NBBMS and on-going management will be set and agreed with key consultees in the final NBBMS document.

4.3.9 It is likely that targets will include:

- Annual survey of the extent and quality of grassland created, with key attributes for the quality of the grassland being sward height and absence of negative indicator plants. This could include measurement against the favourable condition information criteria set out in Natural England guidance 'Definition of Favourable Conservation Status for Lowland meadow (RP2971)'[10] and 'Common Standards Monitoring Guidance for Lowland Grassland Habitats' (Joint Nature Conservation Committee, 2004[11]); specifically pages 13-20 for MG4 and MG8 communities, which most identify to wet grassland.

- Hydrology will most likely be measured based on the extent to which scrapes hold water, both in terms of duration and depths at critical times of the year (see 4.3.6).

Grassland Management

4.3.10 It is anticipated that grassland will be managed in accordance with RSPB guidance on wet grassland management (Benstead *et al*., 1997)[12].

4.3.11 The main principles of grassland management within Cell 3 are likely to be:

- To maintain a short sward in spring, with grass height in April 3cm or less for 80% of Cell 3;
- To maintain taller grass tussocks for shelter: 10-15cm in April, covering no more than 20% of Cell 3;
- Reduce or remove stocking between April and July to lessen the risk of nest trampling by livestock; and,
- Management by grazing during late summer and autumn to create a short sward height between c.5-10cm from October until March to provide foraging grassland for non-breeding wildfowl and waders and the correct sward height for the following April.

4.3.12 Grazing animals will be used to achieve the desired sward structure, supplemented by mechanical means as required. Cattle are considered the optimal grazing animal for Cell 3, and they are currently being used in Cell 3. The use of more sedate stock, such as suckler cows and their calves, is preferable to yearlings or dry cattle which are likely to cause greater nest losses due to trampling. Alternatively, sheep may be used in conjunction with cattle, if sufficient herd numbers are unavailable locally.

[10] https://publications.naturalengland.org.uk/publication/5879561481617408 [accessed April 2025]

[11] https://data.jncc.gov.uk/data/15a03fed-f306-4f01-9139-4933e814b9ec/CSM-LowlandGrasslandHabitats-2004.pdf [accessed April 2025]

[12] Benstead, P., Drake, M., Jose, P.V., Mountford, O., Newbold, C. & Treweek, J. (1997) The Wet Grassland Guide: Managing floodplain and Coastal Wet Grasslands for Wildlife. RSPB, Sandy.

Grazing measures implemented will be entirely under control of the organisation responsible for the management of the NBBMA.

4.3.13 Provided weather conditions are appropriate for cattle welfare, grazing within Cell 3 during the period April to July should not exceed 0.5 Livestock Units (LSU)/Ha/Year based on **Table 4.1**. Stock shall be turned out onto other fields to settle before being moved into Cell 3 between April and July.

4.3.14 In late summer (August - September) grazing will be increased to 2LSU/ha/year. This increased grazing will reduce the sward height necessary for breeding the following spring. During the non-breeding season swans require short, grazed grassland (5cm-15cm) and waders such as lapwing and golden plover prefer soils with high water tables and sward heights <10cm therefore the sward will be maintained between 5-10cm for wintering wildfowl. This will also encourage grass tussocks and assist with managing rush growth. Where livestock are not available, mechanical grazing would be utilised as an alternative to achieve the same sward height. Precise mechanical methods would be determined by the managing organisation.

Table 4.1: Recommended cattle stocking rates (Nix, 2003).

Animal/Breed	Livestock Units (LSU)/Year/ha
Dairy Cow	1.01
Beef Cow (excl. calf)	0.75
Heifer in calf (rearing)	0.80
Bull	0.65
Other cattle 0–1-year-old	0.34
Other cattle 1-2 years old	0.65
Other cattle 2 years old and over	0.80
Lowland ewes	0.11
Breeding ewe hogs 0.5 to 1 year	0.06
Other sheep, over 1 year	0.08
Store lambs, under 1 year	0.04
Rams	0.08

4.3.15 A summary of the proposed grazing regime is presented in **Table 4.2**.

Table 4.2: Summary of proposed grazing regime in Cell 3.

Grazing Density	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2 LSU/ha/yr	✓	✓						✓	✓	✓	✓	✓
≤0.5 LSU/ha/yr			✓	✓	✓	✓	✓					

Restricted Operations

4.3.16 The following activities will be restricted within the NBBMA (as the Applicant will be in control of the land) to minimise impacts on waterfowl and encourage habitat enhancement:

- Installation of any new drainage systems (other than prescribed herein);
- Application of insecticides, fungicides or molluscicides;
- Application of fertilisers;

- Application of lime or any other substance to alter the soil acidity;
- Supplementary feeding of livestock;
- Burning of vegetation or other materials;
- Ploughing, cultivation or re-seeding;
- Planting of trees;
- Earth movement; and,
- Storage of materials or machinery.

4.3.17 Shooting within the NBBMA will be prohibited at any time of year for the entire operational period of the Proposed Development.

4.3.18 In the event that livestock grazing is not possible, a cutting regime to achieve the same objectives as sensitive grazing will be adopted.

5 MONITORING AND REVIEW

5.1.1 Monitoring of the effectiveness of the implementation of the NBBMS would commence at a time as agreed as part of a steering group which will comprise key stakeholders including, but not limited to, Natural England, CWACC, RSPB and the Applicant, and will be undertaken for the 40-year duration of the operational period of the Proposed Development. The purpose of monitoring will be to provide evidence of compliance with the corresponding planning condition.

5.1.2 A separate dynamic management system will be implemented by the independent management body responsible for the NBBMS (see Section 4.3). This will allow the NBBMS to be adjusted so as to ensure the implementation of the agreed Aims of the NBBMS.

5.1.3 Clear and measurable targets will be set to include regular measures being made of sward height (to assume effectiveness of grazing/cutting regimes), extent of water and time of year when the habitats (like scrapes) are wet, which will assess the effectiveness of the water inundation (sluice) system from the water storage area (see Section 4.3).

5.1.4 Compliance monitoring, to demonstrate compliance with corresponding planning condition(s), will be undertaken annually for years 1 to 5 (following completion of the works on the NBBMA), then repeated at year 10 and each five-year period thereafter.

5.1.5 The final NBBMS will include agreed periodic reviews and reporting to relevant bodies including Natural England and CWACC.

Figure 1: Site Location and Cell Numbers

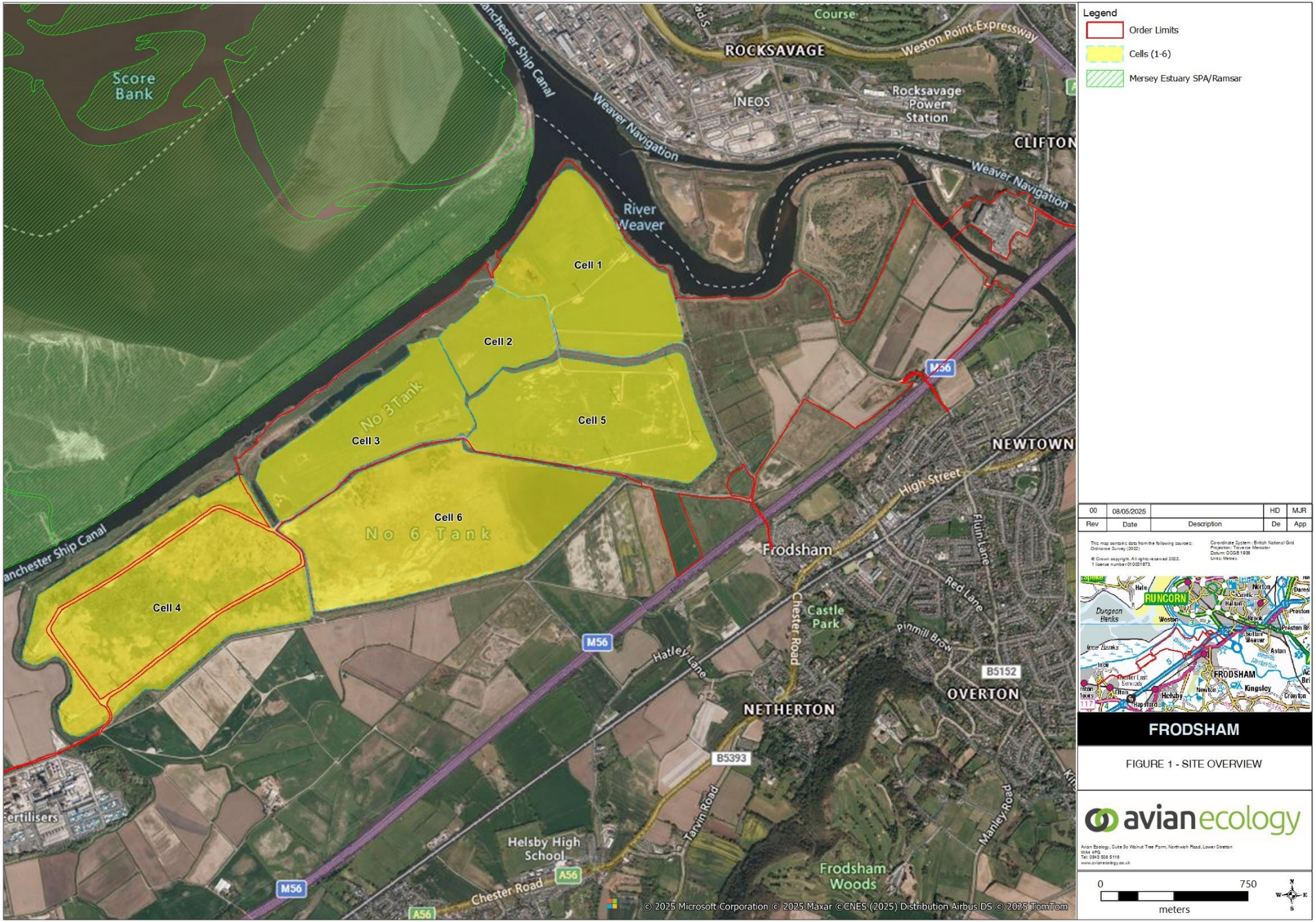


Figure 2: Existing Management Prescriptions

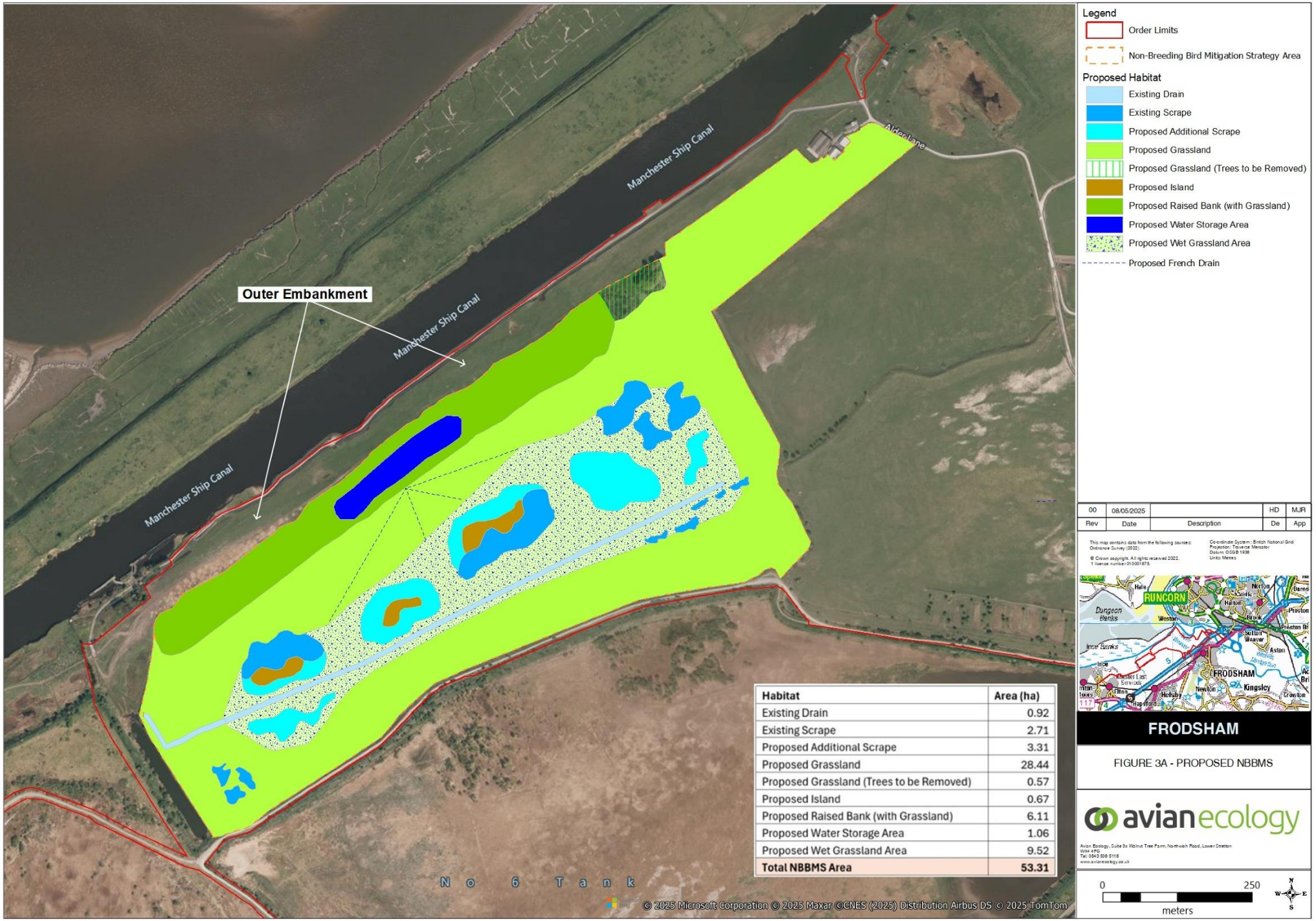
FRODSHAM

FIGURE 2 - EXISTING MANAGEMENT PRESCRIPTIONS

avian ecology

Avian Ecology, Suite 3a Walnut Tree Farm, Northwich Road, Lower Stretton WA4 4PG
Tel: 0843 508 5116
www.avianecology.co.uk

Figure 3a: NBBMS Overview – Option A



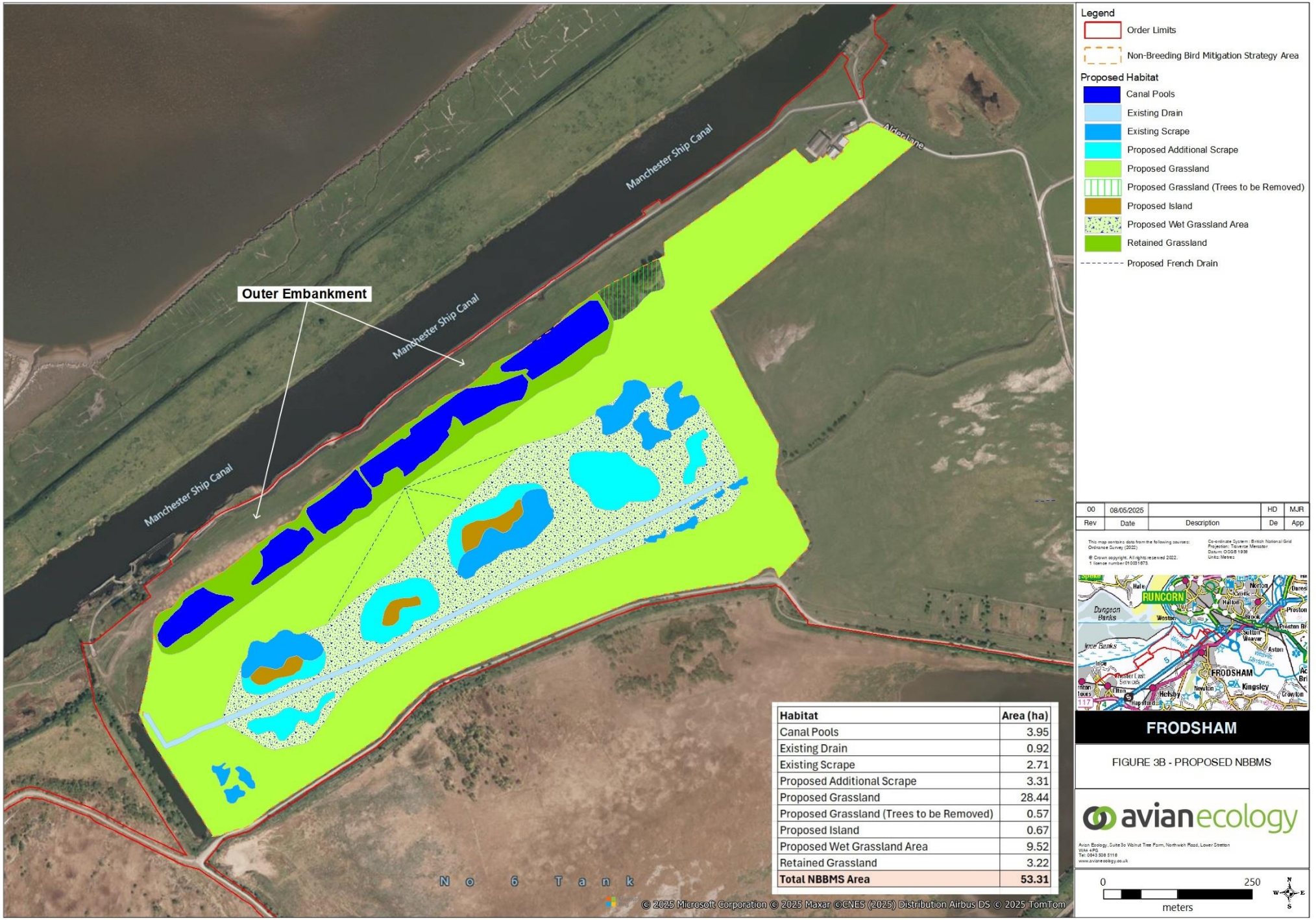
Habitat	Area (ha)
Existing Drain	0.92
Existing Scrape	2.71
Proposed Additional Scrape	3.31
Proposed Grassland	28.44
Proposed Grassland (Trees to be Removed)	0.57
Proposed Island	0.67
Proposed Raised Bank (with Grassland)	6.11
Proposed Water Storage Area	1.06
Proposed Wet Grassland Area	9.52
Total NBBMS Area	**53.31**

FRODSHAM

FIGURE 3A - PROPOSED NBBMS

avianecology

Figure 3b: NBBMS Overview – Option B



Habitat	Area (ha)
Canal Pools	3.95
Existing Drain	0.92
Existing Scrape	2.71
Proposed Additional Scrape	3.31
Proposed Grassland	28.44
Proposed Grassland (Trees to be Removed)	0.57
Proposed Island	0.67
Proposed Wet Grassland Area	9.52
Retained Grassland	3.22
Total NBBMS Area	**53.31**

ANNEX 1 – SPA SPECIES REQUIRED MITIGATION HABITAT CALCULATIONS ('CLEEVE HILL APPROACH')

Note: *At Cleeve Hill approach, the required area of habitat needed to fully mitigate loss of onsite fields for lapwing and golden plover was combined, given the species will readily forage together in tight flocks. This approach was confirmed with one of the authors of the article which documented bird days/ha. As such, the same combination is used for the Proposed Development, with requirements for lapwing and golden plover treated together and the results are shown below.*

See: Cleve Hill Solar Park Environmental Statement Volume 4 - Technical Appendix A9.1 Ornithology Technical Appendix (November 2018); and

Cleve Hill Solar Park Record of the Habitats Regulations Assessment undertaken under Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (May 2020)

Table A1.1. bird-day calculations for the three years of surveys completed within the Site boundary.

Year 1				
	Bird Days/winter. Current use of Site		**Bird days supported by each ha (taken from literature)**	**Area of Mitigation Needed (ha)**
GP	272.5714286		1560	0.174725275
L.	6511.428571		1000	6.511428571
Combined L. & GP	6784		2560	**2.65**
CU	2756		1000	2.756
L./GP + CU				**5.406**
Year 2				
	Bird Days/winter. Current use of Site		**Bird days supported by each ha (taken from literature)**	**Area of Mitigation Needed (ha)**
GP	34232.14286		1560	21.94368132
L.	82309.28571		1000	82.30928571
Combined L. & GP	116541.4286		2560	**45.52399554**
CU	13571.14286		1000	13.57114286
L./GP + CU				**59.09513839**
Year 3				
	Bird Days/winter. Current use of Site		**Bird days supported by each ha (taken from literature)**	**Area of Mitigation Needed (ha)**
GP	39494		1560	25.31666667
L.	107986.6667		1000	107.9866667
Combined L. & GP	147480.6667		2560	**57.60963542**
CU	5460		1000	5.46

L./GP + CU				**63.06963542**

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Appendix C – Condition Assessment Sheets

Condition Sheet: DITCH Habitat Type			
Habitat Type			
Watercourses - Ditches			
Habitat Description			
See the Statutory Biodiversity Metric User Guide.			
On-site or off-site, site name and location		**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
A	The ditch is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.		
B	A range of emergent, submerged and floating-leaved plants are present. As a guide >10 species of emergent, floating or submerged plants present in a 20 m ditch length.		
C	There is less than 10% cover of filamentous algae and or duckweed *Lemna* spp. (these are signs of eutrophication).		
D	A fringe of aquatic marginal vegetation is present along more than 75% of the ditch.		
E	Physical damage is evident along less than 5% of the ditch, with examples of damage including: excessive poaching, damage from machinery use or storage, or any other damaging management activities.		
F	Sufficient water levels are maintained - as a guide a minimum summer depth of approximately 50 cm in minor ditches and 1 m in main drains.		
G	Less than 10% of the ditch is heavily shaded.		
H	There is an absence of non-native plant and animal species[1].		
	Number of criteria passed		

Condition Assessment Result (out of 8 criteria)	Condition Assessment Score	Score Achieved ×/✓
Passes 8 criteria	Good (3)	
Passes 6 or 7 criteria	Moderate (2)	
Passes 5 or fewer criteria	Poor (1)	

Suggested enhancement interventions to improve condition score

Footnotes

Footnote 1 – This includes any species listed on the Water Framework Directive UKTAG GB High Impact Species List: Water Framework Directive (WFD) UKTAG (2021) *Classification of aquatic alien species according to their level of impact* [online]. Available from:
UKTAG classification of alien species working paper v8.pdf (wfduk.org)

• Frequently occurring non-native plant species include water fern *Azolla filiculoides* , Australian swamp stonecrop *Crassula helmsii* , parrot's feather *Myriophyllum aquaticum* , floating pennywort *Hydrocotyle ranunculoides* , Japanese knotweed *Reynoutria japonica* and giant hogweed *Heracleum mantegazzianum* (on the bank).

• Frequently occurring non-native animals include signal crayfish *Pacifastacus leniusculus* , zebra mussel *Dreissena polymorpha* , killer shrimp *Dikerogammarus villosus* , demon shrimp *Dikerogammarus haemobaphes* , and carp *Cyprinus carpio* .

Condition Sheet: GRASSLAND Habitat Type (low distinctiveness)			
UK Habitat Classification (UKHab) Habitat Type			
Grassland - Modified grassland			
On-site or off-site, site name and location		**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	
Habitat Description			
ukhab – UK Habitat Classification			

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
A	There are 6-8 vascular plant species per m^2 present, including at least 2 forbs (these may include those listed in Footnote 1). **Note - this criterion is essential for achieving Moderate or Good condition.** Where the vascular plant species present are characteristic of medium, high or very high distinctiveness grassland, or there are 9 or more of these characteristic species per m^2 (excluding those listed in Footnote 1), please review the full UKHab description to assess whether the grassland should instead be classified as a higher distinctiveness grassland. Where a grassland is classed as medium, high, or very high distinctiveness, please use the relevant condition sheet.		
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for vertebrates and invertebrates to live and breed.		
C	Any scrub present accounts for less than 20% of the total grassland area. (Some scattered scrub such as bramble *Rubus fruticosus* agg. may be present). Note - patches of scrub with continuous (more than 90%) cover should be classified as the relevant scrub habitat type.		
D	Physical damage is evident in less than 5% of total grassland area. Examples of physical damage include excessive poaching, damage from machinery use or storage, erosion caused by high levels of access, or any other damaging management activities.		
E	Cover of bare ground is between 1% and 10%, including localised areas (for example, a concentration of rabbit warrens)[2].		
F	Cover of bracken *Pteridium aquilinum* is less than 20%.		
G	There is an absence of invasive non-native plant species[3] (as listed on Schedule 9 of WCA[4]).		
		Essential criterion achieved (Yes or No)	
		Number of criteria passed	

Condition Assessment Result (out of 7 criteria)	Condition Assessment Score	Score Achieved ×/✓
Passes 6 or 7 criteria including passing essential criterion A	Good (3)	
Passes 4 or 5 criteria including passing essential criterion A	Moderate (2)	
Passes 3 or fewer criteria; OR Passes 4 - 6 criteria (excluding criterion A)	Poor (1)	

Suggested enhancement interventions to improve condition score

Footnotes

Footnote 1 – Creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, curled dock *Rumex crispus*, broad-leaved dock *Rumex obtusifolius*, common nettle *Urtica dioica*, creeping buttercup *Ranunculus repens*, greater plantain *Plantago major*, white clover *Trifolium repens* and cow parsley *Anthriscus sylvestris*.

Footnote 2 – For example, this could include small, scattered areas of bare ground allowing establishment of new species, or localised patches where not exceeding 10% cover.

Footnote 3 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement.

Footnote 4 – Wildlife and Countryside Act 1981 (as amended).

Condition Sheet: GRASSLAND Habitat Type (medium, high and very high distinctiveness)

UK Habitat Classification (UKHab) Habitat Types

Grassland - Lowland calcareous grassland
Grassland - Lowland dry acid grassland
Grassland - Lowland meadows
Grassland - Other lowland acid grassland
Grassland - Other neutral grassland
Grassland - Tall herb communities (H6430) [Not to be confused with the Tall forbs secondary code – see UKHab guidance for details.]
Grassland - Upland acid grassland
Grassland - Upland calcareous grassland
Grassland - Upland hay meadows
Sparsely vegetated land - Calaminarian grassland

On-site or off-site, site name and location		**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

Habitat Description

ukhab – UK Habitat Classification			

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
A	The parcel represents a good example of its habitat type, with a consistently high proportion of characteristic indicator species present relevant to the specific habitat type (and relative to Footnote 3 suboptimal species which may be listed in the UKHab description).[1] **Note - this criterion is essential for achieving Moderate or Good condition for non-acid grassland types only.**		
B	Sward height is varied (at least 20% of the sward is less than 7 cm and at least 20% is more than 7 cm) creating microclimates which provide opportunities for insects, birds and small mammals to live and breed.		
C	Cover of bare ground is between 1% and 5%, including localised areas, for example, rabbit warrens[2].		
D	Cover of bracken *Pteridium aquilinum* is less than 20% and cover of scrub (including bramble *Rubus fruticosus* agg.) is less than 5%.		
E	Combined cover of species indicative of suboptimal condition[3] and physical damage (such as excessive poaching, damage from machinery use or storage, damaging levels of access, or any other damaging management activities) accounts for less than 5% of total area. If any invasive non-native plant species[4] (as listed on Schedule 9 of WCA[5]) are present, this criterion is automatically failed.		
	Additional Criterion - must be assessed for all non-acid grassland types		
F	There are 10 or more vascular plant species per m^2 present, including forbs that are characteristic of the habitat type (species referenced in Footnote 3 and 5 cannot contribute towards this count). **Note - this criterion is essential for achieving Good condition for non-acid grassland types only.**		
	Essential criterion for Good condition achieved (for non-acid grassland) (Yes or No)		
	Number of criteria passed		

Condition Assessment Result	Condition Assessment Score	Score Achieved ×/✓
Acid grassland types (Result out of 5 criteria)		
Passes 5 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	
Passes 2 or fewer criteria	Poor (1)	
Non-acid grassland types (Result out of 6 criteria)		
Passes 5 or 6 criteria, including essential criterion A and additional criterion F.	Good (3)	
Passes 3 - 5 criteria, including essential criterion A.	Moderate (2)	
Passes 2 or fewer criteria; OR Passes 3 or 4 criteria excluding criterion A and F.	Poor (1)	

Suggested enhancement interventions to improve condition score

Notes

Footnote 1 - Professional judgement should be used alongside the UKHab description.

Footnote 2 – For example, this could include small, scattered areas of bare ground allowing for plant colonisation, or localised patches not exceeding 5% cover.

Footnote 3 - Species indicative of suboptimal condition for this habitat type include: creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, curled dock *Rumex crispus*, broad-leaved dock *Rumex obtusifolius*, common nettle *Urtica dioica*, creeping buttercup *Ranunculus repens*, greater plantain *Plantago major*, white clover *Trifolium repens* and cow parsley *Anthriscus sylvestris*. There may be additional relevant species local to the region and or site.

Footnote 4 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, by applying professional judgement.

Footnote 5 – Wildlife and Countryside Act 1981 (as amended).

Condition sheet: HEDGEROW Habitat Types

Habitat Type

Native hedgerow
Native hedgerow - associated with bank or ditch
Native hedgerow with trees
Native hedgerow with trees - associated with bank or ditch
Species-rich native hedgerow
Species-rich native hedgerow - associated with bank or ditch
Species-rich native hedgerow with trees
Species-rich native hedgerow with trees - associated with bank or ditch

Habitat Description

ukhab – UK Habitat Classification

On-site or off-site, site name and location		**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

Condition Assessment Details

A series of ten attributes, representing key physical characteristics are used for this assessment. Each attribute is assigned to one of five functional groups (A – E) and the condition of a hedgerow is assessed according to the number of attributes from these functional groups which pass or fail the 'favourable condition' criteria.

This assessment is based on the Hedgerow Survey Handbook[1] and Favourable Conservation Status document[2]. For further clarification please refer to the Hedgerow Survey Handbook.

Best practice would be to record the species, age, spacing and other key information about all trees present along a hedgerow within the 'Habitat Description' box, as well as other key features of the hedgerow.

Hedgerow favourable condition attributes

Attributes and functional groupings (A, B, C, D and E)		Criteria - the minimum requirements for 'favourable condition'	Criteria description	Criterion passed (Yes or No)	Notes (such as justification)
Core groups - applicable to all hedgerow types					
A1.	Height	>1.5 m average along length	The average height of woody growth estimated from base of stem to the top of the shoots, excluding any bank beneath the hedgerow, any gaps or isolated trees. Newly laid or coppiced hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice). A newly planted hedgerow does not pass this criterion (unless it is >1.5 m height).		
A2.	Width	>1.5 m average along length	The average width of woody growth estimated at the widest point of the canopy, excluding gaps and isolated trees. Outgrowths (such as blackthorn *Prunus spinosa* suckers) are only included in the width estimate when they are >0.5 m in height. Laid, coppiced, cut and newly planted hedgerows are indicative of good management and pass this criterion for up to a maximum of four years (if undertaken according to good practice).		
B1.	Gap - hedge base	Gap between ground and base of canopy <0.5 m for >90% of length	This is the vertical 'gappiness' of the woody component of the hedgerow, and its distance from the ground to the lowest leafy growth. Certain exceptions to this criterion are acceptable (see page 65 of the Hedgerow Survey Handbook).		
B2.	Gap - hedge canopy continuity	Gaps make up <10% of total length; and No canopy gaps >5 m	This is the horizontal 'gappiness' of the woody component of the hedgerow. Gaps are complete breaks in the woody canopy (no matter how small). Access points and gates contribute to the overall 'gappiness' but are not subject to the >5 m criterion (as this is the typical size of a gate).		
C1.	Undisturbed ground and perennial vegetation	>1 m width of undisturbed ground with perennial herbaceous vegetation for >90% of length: · Measured from outer edge of hedgerow; and · Is present on one side of the hedgerow (at least).	This is the level of disturbance (excluding wildlife disturbance) at the base of the hedgerow. Undisturbed ground is present for at least 90% of the hedgerow length, greater than 1 m in width and must be present along at least one side of the hedgerow. This criterion recognises the value of the hedgerow base as a boundary habitat with the capacity to support a wide range of species. Cultivation, heavily trodden footpaths, poached ground etc. can limit available habitat niches.		
C2.	Nutrient-enriched perennial vegetation	Plant species indicative of nutrient enrichment of soils dominate <20% cover of the area of undisturbed ground.	The indicator species used are nettles *Urtica* spp., cleavers *Galium aparine* and docks *Rumex* spp. Their presence, either singly or together, does not exceed the 20% cover threshold.		
D1.	Invasive and neophyte species	>90% of the hedgerow and undisturbed ground is free of invasive non-native plant species (including those listed on Schedule 9 of WCA[3]) and recently introduced species.	Recently introduced species refer to plants that have naturalised in the UK since AD 1500 (neophytes). Archaeophytes count as natives. For information on archaeophytes and neophytes see the JNCC website[4], as well as the BSBI website[5] where the 'Online Atlas of the British and Irish Flora'[6] contains an up-to-date list of the status of species. For information on invasive non-native species see the GB Non-Native Secretariat website[7].		
D2.	Current damage	>90% of the hedgerow or undisturbed ground is free of damage caused by human activities.	This criterion addresses damaging activities that may have led to or lead to deterioration in other attributes. This could include evidence of pollution, piles of manure or rubble, or inappropriate management practices (for example, excessive hedgerow cutting).		
Additional group - applicable to hedgerows with trees only					
E1.	Tree class	There is more than one age-class (or morphology) of tree present (for example: young, mature, veteran and or ancient[8]), and there is on average at least one mature, ancient or veteran tree present per 20 - 50m of hedgerow.	This criterion addresses if there are a range of age-classes or morphologies which allow for replacement of trees and provide opportunities for different species.		
E2.	Tree health	At least 95% of hedgerow trees are in a healthy condition (excluding veteran features valuable for wildlife). There is little or no evidence of an adverse impact on tree health by damage from livestock or wild animals, pests or diseases, or human activity.	This criterion identifies if the trees are subject to damage which compromises the survival and health of the individual specimens.		

The hedgerow condition assessment generates a weighting (score) ranging from 1 - 3, which is used within the Statutory Biodiversity Metric. The scores for each are set out in the tables below.

Condition categories for hedgerows without trees

Category	Category Requirements	Metric Score
Good	No more than 2 failures in total; **AND** No more than 1 failure in any functional group.	3
Moderate	No more than 4 failures in total; **AND** Does not fail both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and C2 = Moderate condition).	2
Poor	Fails a total of more than 4 attributes; **OR** Fails both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and B2 = Poor condition).	1
	Score achieved:	

Condition categories for hedgerows with trees

Category	Category Requirements	Metric score
Good	No more than 2 failures in total; **AND** No more than 1 failure in any functional group.	3
Moderate	No more than 5 failures in total; **AND** Does not fail both attributes in more than one functional group (for example, fails attributes A1, A2, B1, C2 and E1 = Moderate condition).	2
Poor	Fails a total of more than 5 attributes; **OR** Fails both attributes in more than one functional group (for example, fails attributes A1, A2, B1 and B2 = Poor condition).	1
	Score achieved:	

Suggested enhancement interventions to improve condition score

Footnotes

Footnote 1 – DEFRA (2007) *Hedgerow Survey Handbook. A standard procedure for local surveys in the UK.* [online] Available on:
layout (hedgelink.org.uk)
Footnote 2 – STALEY, J.T. ET AL. (2020) *Definition of Favourable Conservation Status for Hedgerows.* [online] Available on:
Definition of Favourable Conservation Status for Hedgerows - RP2943 (naturalengland.org.uk)
Footnote 3 – Wildlife and Countryside Act 1981 (as amended).
Footnote 4 – CHEFFINGS, C. M. et al. (2005) *The Vascular Plant Red Data List for Great Britain.* Species Status 7: 1-116. [online] Available on:
The Vascular Plant Red Data List for Great Britain (Species Status No. 7) | JNCC Resource Hub
Footnote 5 – BOTANICAL SOCIETY OF BRITAIN AND IRELAND (BSBI). *Definitions: wild, native or alien?* [online] Available on:
Definitions: wild, native or alien? – Botanical Society of Britain & Ireland (bsbi.org)
Footnote 6 – BSBI and Biological Records Centre (BRC) (2022) *Online Atlas of the British and Irish Flora.* [online] Available on:
Acknowledgements | Online Atlas of the British and Irish Flora (brc.ac.uk)
Footnote 7 – GB NON-NATIVE SPECIES SECRETARIAT (GBNNSS) (2022) Available on:
Home » NNSS (nonnativespecies.org)
Footnote 8 – See gov.uk standing advice on ancient and veteran trees. Available from:
Keepers of time: ancient and native woodland and trees policy in England (publishing.service.gov.uk)
and
Ancient woodland, ancient trees and veteran trees: advice for making planning decisions - GOV.UK (www.gov.uk)

Condition Sheet: POND Habitat Type			
Habitat Type			
Lakes - Ponds (priority habitat) **Lakes - Ponds (non-priority habitat)** **Lakes - Temporary lakes ponds and pools (H3170)** [Use this condition sheet for Temporary ponds and pools, use Lake condition sheet for Temporary lakes] **Lakes - Ornamental lake or pond** [Use this condition sheet for Ornamental ponds, use Lake condition sheet for Ornamental lakes]			
Habitat Description			
ukhab – UK Habitat Classification			
On-site or off-site, site name and location		**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	Criterion passed (Yes or No)	Notes (such as justification)
Core Criteria - applicable to all ponds (woodland[1] and non-woodland):			
A	The pond is of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution. Turbidity is acceptable if the pond is grazed by livestock.		
B	There is semi-natural habitat (moderate distinctiveness or above) completely surrounding the pond, for at least 10 m from the pond edge for its entire perimeter.		
C	Less than 10% of the water surface is covered with duckweed *Lemna* spp. or filamentous algae.		
D	The pond is not artificially connected to other waterbodies, such as agricultural ditches or artificial pipework.		
E	Pond water levels can fluctuate naturally throughout the year. No obvious artificial dams[2], pumps or pipework.		
F	There is an absence of listed non-native plant and animal species[3].		
G	The pond is not artificially stocked with fish. If the pond naturally contains fish, it is a native fish assemblage at low densities.		
Additional Criteria - must be assessed for all non-woodland ponds:			
H	Emergent, submerged or floating plants (excluding duckweed)[4] cover at least 50% of the pond area which is less than 3 m deep.		
I	The pond surface is no more than 50% shaded by adjacent trees and scrub.		
	Number of criteria passed		

Condition Assessment Result	Condition Assessment Score	Score Achieved ×/✓
Results for woodland ponds which require assessment of 7 core criteria		
Passes 7 criteria	Good (3)	
Passes 5 or 6 criteria	Moderate (2)	
Passes 4 or fewer criteria	Poor (1)	
Results for non-woodland ponds which require assessment of 9 criteria		
Passes 9 criteria	Good (3)	
Passes 6 to 8 criteria	Moderate (2)	
Passes 5 or fewer criteria	Poor (1)	

Suggested enhancement interventions to improve condition score

Footnote 1 - A woodland pond will be surrounded on all sides by woodland habitat.

Footnote 2 – This excludes natural dams such as those created by Eurasian beaver *Castor fiber*.

Footnote 3 - Any species included on the Water Framework Directive (WFD) UKTAG GB High Impact Species List should be absent: WFD UKTAG (2021) *Classification of aquatic alien species according to their level of impact* [online]. Available from:

UKTAG classification of alien species working paper v8.pdf (wfduk.org)

• Frequently occurring non-native plant species include water fern *Azolla filiculoides*, Australian swamp stonecrop *Crassula helmsii*, parrot's feather *Myriophyllum aquaticum*, floating pennywort *Hydrocotyle ranunculoides* and Japanese knotweed *Reynoutria japonica*, giant hogweed *Heracleum mantegazzianum* (on the bank).
• Frequently occurring non-native animals include signal crayfish *Pacifastacus leniusculus*, zebra mussels *Dreissena polymorpha*, killer shrimp *Dikerogammarus villosus*, demon shrimp *Dikerogammarus haemobaphes*, carp *Cyprinus carpio*.

Footnote 4 - If the pond is seasonal (as in, it dries out in most summers) then emergent species alone are likely to be found.

Condition Sheet: SCRUB Habitat Type

Habitat Types

Heathland and shrub - Blackthorn scrub
Heathland and shrub - Gorse scrub
Heathland and shrub - Hawthorn scrub
Heathland and shrub - Hazel scrub
Heathland and shrub - Mixed scrub
Heathland and shrub - Dunes with sea buckthorn (H2160)
Heathland and shrub - Willow scrub

Habitat Description

For Dunes with sea buckthorn see:	Dunes with sea-buckthorn (Dunes with Hippophae rhamnoides) - Special Areas of Conservation (jncc.gov.uk)		
For other scrub types see:	ukhab – UK Habitat Classification		
On-site or off-site, site name and location		**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
A	The parcel represents a good example of its habitat type - the appearance and composition of the vegetation closely matches its UKHab description (where in its natural range).[1] - At least 80% of scrub is native, - There are at least three native woody species[2], - No single species comprises more than 75% of the cover (except hazel *Corylus avellana* , common juniper *Juniperus communis* , sea buckthorn *Hippophae rhamnoides* (only in its restricted native range), or box *Buxus sempervirens* , which can be up to 100% cover).		
B	Seedlings, saplings, young shrubs and mature (or ancient or veteran[3]) shrubs are all present.		
C	There is an absence of invasive non-native plant species[4] (as listed on Schedule 9 of WCA[5]) and species indicative of suboptimal condition[6] make up less than 5% of ground cover.		
D	The scrub has a well-developed edge with scattered scrub and tall grassland and or forbs present between the scrub and adjacent habitat.		
E	There are clearings, glades or rides present within the scrub, providing sheltered edges.		
		Number of criteria passed	

Condition Assessment Result (out of 5 criteria)	**Condition Assessment Score**	**Score Achieved ×/✓**
Passes 5 criteria	Good (3)	
Passes 3 or 4 criteria	Moderate (2)	
Passes 2 or fewer criteria	Poor (1)	

Suggested enhancement interventions to improve condition score

Footnotes

Footnote 1 – Professional judgement should be used alongside the UKHab description.

Footnote 2 – Native woody species as defined and listed in the Hedgerow Survey Handbook: DEFRA (2007) *Hedgerow Survey Handbook: A standard procedure for local surveys in the UK.* 2nd ed. [online]. Defra, London. PB1195. Available from: Hedgerow Survey Handbook (publishing.service.gov.uk).

Footnote 3 – See gov.uk standing advice on ancient and veteran species. Available from:

Keepers of time: ancient and native woodland and trees policy in England (publishing.service.gov.uk)	and
Ancient woodland, ancient trees and veteran trees: advice for making planning decisions - GOV.UK (www.gov.uk)	

Footnote 4 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement.

Footnote 5 – Wildlife and Countryside Act 1981 (as amended).

Footnote 6 – Species indicative of suboptimal condition for this habitat type may include: non-native conifers, tree-of-heaven *Alianthus altissima* , holm oak *Quercus ilex* , European turkey oak *Quercus cerris* , cherry laurel *Prunus laurocerasus* , snowberry *Symphoricarpos* spp., shallon *Gaultheria shallon* , American skunk cabbage *Lysichiton americanus* , buddleia *Buddleja* spp., cotoneaster *Cotoneaster* spp., Spanish bluebell *Hyacinthoides hispanica* and hybrid bluebells *Hyacinthoides x massartiana* . There may be additional relevant species local to the region and or site.

Condition Sheet: WETLAND Habitat Type

Habitat Types

Grassland - Floodplain wetland mosaic and CFGM - See the Statutory Biodiversity Metric User Guide.
Wetland - Blanket bog
Wetland - Depression on peat substrates (H7150)
Wetland - Fens (upland and lowland)
Wetland - Lowland raised bog
Wetland - Oceanic valley mire [1] (D2.1)
Wetland - Purple moor grass and rush pastures
Wetland - Reedbeds
Wetland - Transition mires and quaking bogs (H7140)

Habitat Description

For Oceanic valley mires - see EUNIS

See the Statutory Biodiversity Metric User Guide for Floodplain wetland mosaic (FWM) and coastal and floodplain grazing marsh (CFGM). For CFGM also see the below:

Coastal and floodplain grazing marsh UK BAP Priority Habitat description

Priority Habitat Inventory (England) - data.gov.uk

All other wetland habitats - see UK Habitat Classification (UKHab):

UKHab

On-site or off-site, site name and location		**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

	Condition Assessment Criteria	**Criterion passed (Yes or No)**	**Notes (such as justification)**
Core Criteria - must be assessed for **all wetland habitat types**:			
A	The water table is at, or near the surface throughout the year - this could be open water or saturation of soil at the surface. There is no artificial drainage, unless specifically to maintain water levels as specified above. **Note - this criterion is essential for achieving Good condition.**		
B	The parcel represents a good example of its specific habitat type - the appearance and composition of the vegetation closely matches its UKHab description, with vascular and non-vascular characteristic indicator species consistently present.[1]		
C	The water supplies (groundwater, surface water and or rainwater) to the wetland are of good water quality, with clear water (low turbidity) indicating no obvious signs of pollution.		
D	Cover of scrub and scattered trees are less than 10%.		
E	Cover of bare ground is less than 5%.		
F	There is an absence of invasive non-native plant species[2] (as listed on Schedule 9 of WCA[3]) and species indicative of suboptimal condition[4] make up less than 5% of ground cover.		
Additional Criterion - must be assessed for **Fen and Purple moor grass and rush pasture** habitats only:			
G	No more than 25% of the habitat area has a continuous cover of litter (such as dead vegetation) preventing regeneration.		
Additional Criterion - must be assessed for **Bog** habitats only:			
H	Sphagnum moss *Sphagnum* spp. and cottongrasses *Eriophorum* spp. are at least Frequent[5]. Cover of ericaceous dwarf shrubs[6] is less than 75%.		
Additional Criterion - must be assessed for **Reedbed** habitats only:			
I	The reedbed has a diverse structure with between 60% and 80% reeds *Phragmites australis*. Other areas may include open water (at least 10%), species-rich fen and or wet woodland.		
Additional Criterion - must be assessed for **Floodplain wetland mosaic and CFGM** only:			
J	All ditches recorded within the habitat achieve Good condition as assessed using the Ditch condition sheet.		
	Essential criterion achieved (required for Good condition) Yes or No:		
	Number of criteria passed		

Condition Assessment Result	**Condition Assessment Score**	**Score Achieved ×/✓**
Results for habitats requiring assessment of 6 criteria (Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1)):		
•Passes 5 or 6 core criteria, including criterion A.	Good (3)	
•Passes 3 or 4 core criteria; OR •Passes 5 core criteria but fails criterion A.	Moderate (2)	
•Passes 2 or fewer core criteria.	Poor (1)	
Results for habitats requiring assessment of 7 criteria - core criteria and additional criterion specified for habitat type - all habitat types except Depression on peat substrates (H7150) and Oceanic valley mire [1] (D2.1):		
•Passes 5 or 6 core criteria including criterion A; AND •Passes additional criterion G, H, I or J (choose the one specified for the habitat type).	Good (3)	
•Passes 4 or 5 of 7 criteria; OR •Passes 6 of 7 criteria but fails criterion A or additional criterion G, H, I or J (choose the one specified for the habitat type).	Moderate (2)	
•Passes 3 or fewer criteria.	Poor (1)	

Suggested enhancement interventions to improve condition score

Footnotes

Footnote 1 – Professional judgement should be used alongside the UKHab description.

Footnote 2 – Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly, applying a buffer zone around the invasive non-native species with a size relative to its risk of spread into adjacent habitat, using professional judgement.

Footnote 3 – Wildlife and Countryside Act 1981 (as amended).

Footnote 4 – Species indicative of suboptimal condition for this habitat type include: creeping thistle *Cirsium arvense*, spear thistle *Cirsium vulgare*, common nettle *Urtica dioica*, docks *Rumex* spp., and common ragwort *Jacobaea vulgaris*. There may be additional relevant species local to the region and or site.

Footnote 5 – According to the relative abundance DAFOR scale – Dominant, Abundant, Frequent, Occasional or Rare.

Footnote 6 – Ericaceous dwarf shrubs include: crowberry *Empetrum nigrum*, cowberry *Vaccinium vitis-idaea*, bilberry *Vaccinium myrtillus*, cranberry *Vaccinium oxycoccos*, heather *Calluna vulgaris*, cross-leaved heath *Erica tetralix*, and bell heather *Erica cinerea*. There may be additional relevant species local to the region and or site.

Footnote 7 – For fens, specify what fen type is present using base-status and trophic status - alkaline, neutral, or acidic; eutrophic, mesotrophic or oligotrophic.

Condition Sheet: WOODLAND Habitat Type

UK Habitat Classification (UKHab) Habitat Types

Woodland and forest - Lowland beech and yew woodland
Woodland and forest - Lowland mixed deciduous woodland
Woodland and forest - Native pine woodlands
Woodland and forest - Other coniferous woodland
Woodland and forest - Other Scot's pine woodland
Woodland and forest - Other woodland; broadleaved
Woodland and forest - Other woodland; mixed
Woodland and forest - Upland birchwoods
Woodland and forest - Upland mixed ashwoods
Woodland and forest - Upland oakwood
Woodland and forest - Wet woodland

Habitat Description

ukhab – UK Habitat Classification

This condition sheet is based on the England Woodland Biodiversity Group (EWBG) Woodland Condition Survey Method, available here:
Woodland Wildlife Toolkit (sylva.org.uk)

IMPORTANT: This biodiversity metric woodland condition assessment must be used to assess woodland being input into the biodiversity metric. The outputs of this condition assessment are not equivalent to, nor are they comparable with the scores from the EWBG condition assessment, because the EWBG assessment has been adapted for the biodiversity metric, including the removal of EWBG Indicator 7 (Proportion of favourable land cover around woodland) and Indicator 14 (Size of woodland), and minor changes to other indicators.

On-site or off-site, site name and location		**Survey date and Surveyor name**	
Limitations (if applicable)		**Survey reference (if relating to a wider survey)**	
Grid reference		**Habitat parcel reference**	

Condition Assessment Criteria

	Indicator	Good (3 points)	Moderate (2 points)	Poor (1 point)	Score per indicator	Notes (such as justification)
A	**Age distribution of trees**	Three age-classes[1] present.	Two age-classes[1] present.	One age-class[1] present.		
B	**Wild, domestic and feral herbivore damage**	No significant browsing damage evident in woodland[2].	Evidence of significant browsing pressure is present in less than 40% of whole woodland[2].	Evidence of significant browsing pressure is present in 40% or more of whole woodland[2].		
C	**Invasive plant species**	No invasive species[3] present in woodland.	Rhododendron *Rhododendron ponticum* or cherry laurel *Prunus laurocerasus* not present, and other invasive species[3] <10% cover.	Rhododendron or cherry laurel present, or other invasive species[3] ≥10% cover.		
D	**Number of native tree species**	Five or more native tree or shrub species[4] found across woodland parcel.	Three to four native tree or shrub species[4] found across woodland parcel.	Two or less native tree or shrub species[4] across woodland parcel.		
E	**Cover of native tree and shrub species**	>80% of canopy trees and >80% of understory shrubs are native[5].	50 - 80% of canopy trees and 50 - 80% of understory shrubs are native[5].	<50% of canopy trees and <50% of understory shrubs are native[5].		
F	**Open space within woodland**	10 - 20% of woodland has areas of temporary open space[6]. Unless woodland is <10ha, in which case 0 - 20% temporary open space is permitted[7].	21 - 40% of woodland has areas of temporary open space[6].	<10% or >40% of woodland has areas of temporary open space[6]. But if woodland <10ha has <10% temporary open space, please see Good category[7].		
G	**Woodland regeneration**	All three classes present in woodland[8]; trees 4 - 7 cm Diameter at Breast Height (DBH), saplings and seedlings or advanced coppice regrowth.	One or two classes only present in woodland[8].	No classes or coppice regrowth present in woodland[8].		
H	**Tree health**	Tree mortality 10% or less, no pests or diseases and no crown dieback[9].	11% to 25% tree mortality and or crown dieback or low-risk pest or disease present[9].	Greater than 25% tree mortality and or any high-risk pest or disease present[9].		
I	**Vegetation and ground flora**	Recognisable NVC plant community[10] at ground layer present, strongly characterised by ancient woodland flora specialists.	Recognisable woodland NVC plant community[10] at ground layer present.	No recognisable woodland NVC plant community[10] at ground layer present.		
J	**Woodland vertical structure**	Three or more storeys across all survey plots, or a complex woodland[11].	Two storeys across all survey plots[11].	One or less storey across all survey plots[11].		
K	**Veteran trees**	Two or more veteran trees[12] per hectare.	One veteran tree[12] per hectare.	No veteran trees[12] present in woodland.		
L	**Amount of deadwood**	50% of all survey plots within the woodland parcel have deadwood, such as standing and fallen deadwood, large dead branches and or stems, branch stubs and stumps, or an abundance of small cavities[13].	Between 25% and 50% of all survey plots within the woodland parcel have deadwood, such as standing and fallen deadwood, large dead branches and or stems, stubs and stumps, or an abundance of small cavities[13].	Less than 25% of all survey plots within the woodland parcel have deadwood, such as standing and fallen deadwood, large dead branches and or stems, stubs and stumps, or an abundance of small cavities[13].		
M	**Woodland disturbance**	No nutrient enrichment or damaged ground evident[14].	Less than 1 hectare in total of nutrient enrichment across woodland area, and or less than 20% of woodland area has damaged ground[14].	1 hectare or more of nutrient enrichment, and or 20% or more of woodland area has damaged ground[14].		
				Total Score (out of a possible 39)		

Condition Assessment Result	Condition Assessment Score	Result Achieved
Total score >32 (33 to 39)	Good (3)	
Total score 26 to 32	Moderate (2)	
Total score <26 (13 to 25)	Poor (1)	

Suggested enhancement interventions to improve condition score

Footnotes

Footnotes below refer to the EWBG woodland condition assessment details: EWBG (No date). *Assessing your Woodland's Condition* [online]. Available from:
Woodland Wildlife Toolkit (sylva.org.uk)

The woodland condition assessment survey methodology is outlined in the EWBG toolkit. However the criteria on this sheet are those specific to the Statutory Biodiversity Metric and must be used when assessing woodland condition.

Footnote 1 - See EWBG method INDICATOR 1 for more information. If tree species is not a birch *Betula* sp., cherry *Prunus* sp. or *Sorbus* sp.: 0 – 20 years (Young); 21 - 150 years (Intermediate); and >150 years (Old). For birch, cherry or *Sorbus* species; 0 - 20 years = Young; 21 - 60 years =Intermediate; >60 years = Old. A recognisable age-class should be a consistent recognisable layer across the woodland or stand being assessed. Presence of a few saplings would not indicate that the woodland has an 'age-class' of young trees.

Footnote 2 - See EWBG method INDICATOR 2 for more information. Browsing pressure is considered to be significant where >20% of vegetation visible within each survey plot shows damage from any type of browsing pressure listed.

Footnote 3 - See EWBG method INDICATOR 3 for more information. Assess this for each distinct habitat parcel. If the distribution of invasive non-native species varies across the habitat, split into parcels accordingly.

Check for the presence of all plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), particularly the following invasive non-native species: American skunk cabbage *Lysichiton americanus* ; Himalayan balsam *Impatiens glandulifera* ; Japanese knotweed *Reynoutria japonica* ; cherry laurel *Prunus laurocerasus* ; shallon *Gaultheria shallon* ; snowberry *Symphoricarpos albus* ; variegated yellow archangel *Lamiastrum galeobdolon subsp. argentatum* ; rhododendron *Rhododendron ponticum* ; and tree-of-heaven *Alianthus altissima* .

Footnote 4 - See EWBG method INDICATOR 4 and Table 2 for more information. The number of different native tree or shrub species including young trees and shrubs. A list of commonly found native tree and shrub species is provided in Table 2. Not all species listed are native to all parts of the UK. Note a list of commonly found non-native tree species are also included and should be recorded if present.

Footnote 5 - See EWBG method INDICATOR 5 and for more information. The abundance of native tree species in upper (>5 m) and understorey (up to 5 m) layers including young trees and shrubs.

Footnote 6 - See EWBG method INDICATOR 6 for more information. Open space within woodland in this context is temporary open space in which trees can be expected to regenerate (for example, glades, rides, footpaths, areas of clear-fell). This differs from permanent open space where tree regeneration is not possible or desirable (for example, tarmac, buildings, rivers). Area is at least 10 m wide with less than 20% covered by shrubs or trees.

Footnote 7 – Given the increased ratio of edge habitat to woodland where the woodland is <10ha.

Footnote 8 - See EWBG method INDICATOR 8 for more information. This indicator measures regeneration potential of the woodland by considering three classes: seedlings; saplings; and young trees of 4-7 cm DBH. All three classes would fall in the 'young' category of the 'age distribution of trees' indicator, but the regeneration indicator gathers additional information by considering regeneration potential - if seedlings, saplings and young trees are all present that means natural regeneration processes are happening.

Footnote 9 - See EWBG method INDICATOR 9 for more information and Table 3 for a list of diseases and pests and their risk level.

Footnote 10 - See EWBG method INDICATOR 10 directing to NVC key for more information. The 'UKHab to NVC translation table' in the UK Habitat Classification resources may also be useful to assess this.

Footnote 11 – This criterion looks at structural diversity and is useful to understand in conjunction with the age of trees in a woodland. Vertical structure is defined as the number of canopy storeys present. Possible storey values are: 1) Upper; 2) Complex: recorded when the stand is composed of multiple tree heights that cannot easily be stratified into broad height bands (such as upper, middle or lower); 3) Middle; 4) Lower; and 5) Shrub layer. There might be no storeys where the woodland has been felled. See EWBG INDICATOR 11 for more information.

Footnote 12 - See EWBG method INDICATOR 12 for more information. See gov.uk standing advice on ancient and veteran trees. Available from:

Keepers of time: ancient and native woodland and trees policy in England (publishing.service.gov.uk)
and:
Ancient woodland, ancient trees and veteran trees: advice for making planning decisions - GOV.UK (www.gov.uk)

EWBG INDICATOR 12 is the relevant indicator.

Footnote 13 – See EWBG method INDICATOR 13 for more information. This includes logs, large dead branches on the forest floor and stumps (<1 m tall) >20 cm diameter at narrowest point and >50 cm long. Also includes standing dead trees (>1 m tall) and also deadwood on standing live trees. Diameter is measured at the narrowest point on the stem. Minimum diameter of 20 cm.

Footnote 14 - See EWBG method INDICATOR 15 for more information. Examples of disturbance are: significant nutrient enrichment; soil compaction from trampling, machinery, animal poaching or litter.