Technical Appendix 5-5
Peatland Restoration Plan(PRP)

EIAR – Volume 3

Muingmore Wind Farm

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Peatland Restoration Plan

RWE Renewables Ireland Limited

Prepared by: Ida Bailey

SLR Consulting Limited

No. 50 Stirling Business Centre, Wellgreen, Stirling,
FK8 2DZ

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Executive Summary

The Muingmore Wind Farm Peatland Restoration Plan (PRP) and Habitat Management Plan (HMP – Appendix A) sets out a strategy to achieve a net-zero position for biodiversity and carbon impacts associated with the Proposed Development. The plans align with Irish, EU, and local policy frameworks, including the EU Nature Restoration Law (2024) and the National Peatland Strategy.

Purpose and Scope

The PRP report addresses the ecological and carbon implications of peatland habitats on-site, which include blanket bog (PB3), cutover bog (PB4), scrub (WS1) and Conifer Plantation (WD4) on deep peat. It is important to note that all PB3 and PB4 habitats align with the criteria for Annex I Blanket Bog [7130] – none of which was identified to be active/peat forming and therefore it is not priority status. Given the high carbon storage potential of peat soils, the Proposed Development aims to offset habitat loss and carbon emissions through extensive restoration by rewetting of previously drained and cutover bog habitats. The plan follows four key steps:

- Quantify biodiversity loss and restoration needs through detailed habitat surveys and metrics.
    - Assess carbon balance, including sequestration potential and re-use of excavated peat.
    - Determine restoration feasibility considering hydrology, infrastructure, and ecological constraints.
    - Define restoration areas and management actions in a Habitat Management Plan (HMP).

Key Findings

- Habitat Loss: 30 ha of Annex I blanket bog will be directly or indirectly affected by construction.
- Restoration Requirement: Current plans target ~200 ha, delivering 1:6 compensation (by restoration) ratio, resulting in an overall enhancement of biodiversity.
- Carbon Benefits: Reuse of excavated peat in bog restoration will mitigate the extent of CO_2e emissions released due to the Proposed Project via peat excavation by approximately c. 119.9 tCO_2e overall.
- Feasibility: Restoration of blanket bog is technically viable across most open ground and key-holed forestry areas, using ditch blocking, ground smoothing, scrub clearance, and hag / cutting-face re-profiling.
- Biodiversity Net Gain (BNG) Outcome: Application of the Scottish and Southern Energy (SSE) Biodiversity Metric[1] (see Section 3.4.2.3) indicates that considering all habitat losses and gains, a 32% net gain will be achieved overall, with additional gains for irreplaceable habitats.

[1] https://www.sserenewables.com/sustainability/nature-positive/

HMP

The HMP has the following Goals, and provides implementation and monitoring plans for the protection and restoration of nature and biodiversity on site in line with the mitigation measures set out in Chapter 5 of EIAR and PRP:

1. Minimise, as far as practicable, the removal of peat and bog vegetation from site during construction.
2. Compared to baseline, enhance the condition of peatlands outside afforested areas via restoration for the benefit of associated biodiversity, carbon storage and sequestration, and water management.
3. Eradicate, as far as practicable, invasive alien plant species from the site.
4. Maintain populations of breeding birds and bats, relative to natural variation.
5. Restore the over-run areas 1 and 2 to baseline or better habitat condition following the removal of temporary infrastructure.

The HMP is a live document that will be revised post planning consent to incorporate any relevant planning conditions to facilitate adaptive management of habitat restoration and enhancement work.

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Appendices

Appendix A **A. Habitat Management Plan**
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1.0 Introduction

The purpose of this report is to set out a Peatland Restoration (PRP) and Habitat Management Plan (HMP) that robustly demonstrates how the Proposed Project – as defined in **Chapter 2** of the associated EIAR, can achieve a net-zero position in terms of biodiversity in line with relevant policy and guidance. Net-zero in this context is linked to the impacts identified in **Chapter 5** of the EIAR which identifies the loss of degraded habitat such as cutover bogs (PB4) and lowland blanket bog (PB3) which aligns with Annex I Blanket bog in unfavourable condition and the requirement to restore similarly degraded habitats to a higher ecological condition and favourable conservation status.

This plan covers:

- The Proposed Development Site including:
    - The Main Wind Farm Development Site: part of the Proposed Development Site which includes the proposed wind turbines and associated infrastructure.
    - Three over-run areas along the turbine delivery route (TDR) to the Proposed Development Site, and
    - The Habitat Enhancement Area in the NWQ (HEA), a small separate triangular area to the northwest of the Main Wind Farm Development Site, which will not include any infrastructure related to the Proposed Project other than that to enhance habitat.

Muingmore Wind Farm is a proposed 13 turbine wind farm and associated infrastructure in Ireland (the Proposed Development). All elements are described in **Chapter 2** of this EIAR.

Based on habitat surveys completed, the dominant habitats on the Main Wind Farm Development Site are peatlands including areas planted with conifer plantation and blanket bog. Bog is predominantly degraded blanket bog with priority lowland blanket bog largely limited to the HEA. Other habitats include wet grassland and scrub.

The wider area surrounding the Main Wind Farm Development Site is a mix of blanket bog and degraded (drained) blanket bog which provides largely uninterrupted habitat connectivity to the Wild Nephin National Park, the exceptions are roads and watercourses.

Key terminology includes avoidance, mitigation, compensation and enhancement, these are defined as set out in CIEEM's Key Principals of EcIA[2]:

- Avoidance: Seek options that avoid harm to ecological features (for example, by locating on an alternative site).
- Mitigation Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.
- Compensation[3] Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
- Enhancement Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

[2] https://cieem.net/wp-content/uploads/2018/08/EcIA-Guidelines-v1.3-Sept-2024.pdf

[3] In this context compensation does not relate to compensation for the purposes of article 6 (4) of the Habitats Directive.

1.1 The Carbon Implications of Bog Habitats on Site

Peat is a carbon store and blankets the majority of the Main Wind Farm Development Site at >50cm depth. Even a thin peat layer of 30cm has a carbon store equivalent to tropical rainforest ha/ha [4], and the 2006 IPPC guidance for National Greenhouse Gas Inventories considers organic soils (including peatlands) with a depth of >10cm. As the majority of the Main Wind Farm Development Site is peatland, it therefore contains significant stores of carbon.

As it stands, available national statistics suggest that near natural bog should remove 3.54tCO_2e per hectare from the atmosphere per year. However, as the bog on the Main Wind Farm Development Site is mostly drained (Figure 6) it could be a carbon source. Drained peat and peat planted with commercial forestry are often carbon sources as they dry the peat compared to its natural saturated state permitting oxidation of the stored carbon. Areas of priority Annex 1 bog, particularly those parts in good condition, where no peat extraction has been undertaken such as parts of the HEA may however be carbon sinks.

The construction of the Proposed Development will require some drainage and displacement of peat and peatland including blanket bog.

Therefore, in terms of land use change (not taking into account the carbon benefit of displacing fossil fuel electrical generation with wind), the Proposed Development would likely generate an increase in net greenhouse gas emissions, if it damages bog further, or a net sink, if bog condition is improved enough for peat forming to begin again as is planned via the PRP (see Section 3.5 for more details).

1.2 Level of Ambition

The Proposed Project will focus on peatland restoration in non-afforested areas. In summary, this involves considering restoration of all degraded/ drained peatland within the Main Wind Farm Development Site and HEA that is not currently under conifer plantation.

1.3 Scope

This peatland restoration study is split into four steps:

- **Step 1**: Determine the area of bog restoration required for compensation in terms of biodiversity (to reach at least no net loss for biodiversity), and therefore the potential for enhancement (net biodiversity gain) via restoration of additional areas; and detailed habitat surveys.
- **Step 1a:** Detailed habitat surveys.
- **Step 1b:** Calculation of biodiversity loss.
- **Step 1c:** Calculation of the area of peatland restoration required for biodiversity compensation and enhancement incl. which areas of the Main Wind Farm Development Site will be prioritised for this.
- **Step 2**: Accounting for carbon sequestration and storage by restored bog and re-use of excavated peat.
- **Step 3**: Determine the total area of bog that it is feasible to restore (re-wet) within the open ground on the Main Wind Farm Development Site and HEA, taking into account constraints such as infrastructure and ecological sensitivities.

[4] ICUN Peatland Programme. 2020. Position statement: Peatland and trees: https://www.iucn-uk-peatlandprogramme.org/sites/default/files/header-images/Resources/IUCN%20UK%20PP%20Peatlands%20and%20trees%20position%20statement%202020.pdf

- **Step 4**: Define the area of bog to be restored and provide an associated Habitat Management Plan (HMP).

The methodology and results for these steps are set out in the following Sections.

1.4 Relevant Policy and Legislation

The following policy and legislation is relevant to this report, particularly in relation to biodiversity, Annex 1 habitats, and peatland re-wetting and restoration.

- EU Habitats Directive (Council Directive 92/43/EEC), which aims to ensure the conservation of biodiversity across Europe by safeguarding natural habitats and species, in particular Annex I habitats (as amended).
- The EIA Directive (2011/92/EU) in relation to projects that might significantly affect the environment, including impacts on Annex I habitats (as amended).
- Ireland's national peatland strategy was published in 2015[25].
- The Mayo County Development Plan 2022-2028.
- The EU Nature Restoration Law[31] - approved in June 2024 and has requirements in relation to peat re-wetting.
- Project Ireland 2040: National Planning Framework (First revision – April 2025)[5].

1.5 The Project Team - Statement of Authority

This report was prepared by Ida Bailey, with support from SLR's wider biodiversity, hydrogeology, carbon and GIS teams. Qualifications and experience for key team members are provided below:

1.5.1.1 Ida Bailey, PhD, ACIEEM, CERPIT (Natural Capital)

Ida leads SLR's Nature and Natural Capital team in Europe. She has a PhD., and B.Sc. in biodiversity and natural sciences related fields. She is an Associate member of CIEEM, a certified ecological restoration practitioner in training (CERPIT) with the Society for Ecological Restoration and sits on the panel of academic specialist for the Biodiversity Futures Initiative. She has over 17 years of ecological consultancy and research experience both in the UK and overseas and specialises in innovative, multidisciplinary ecological restoration, nature positive, bio-credit and natural capital projects.

1.5.1.2 Andrew Torsney PhD, MRes, BSc. (Habitats and Ecology)

Andrew is a Technical Director in SLR's Ecology and Biodiversity technical discipline and manages the Irish Ecology team. Andrew has over 12 years' experience within the ecology and environmental sector. He has managed and undertaken ecological assessments at a range of scales including detailed Annex I habitat surveys. Andrew has also conducted research on the implications of habitat classification regarding conservation outcomes of Annex I habitats. Andrew is a technical botanical specialist with extensive planning experience regarding ecological assessments at all scales from local to national.

1.5.1.3 Adrian Cowe, MSc (Hydro-geology)

Adrian is an associate hydrologist. His key areas of experience and interest are in the areas of hydrological, hydrogeological and geological assessment for EIA and FRA, and quantitative water quality assessments. He holds expert knowledge and experience of

[5] https://cdn.npf.ie/wp-content/uploads/National-Planning-Framework-First-Revision-April-2025-1.pdf

surface and ground water sampling methodology, water quality monitoring instrumentation and data analysis. He has worked for a wide range of clients across a number of sectors including power, mining, water utilities and transport.

1.5.1.4 Chris Marshall, PhD, MSc (Peatland restoration)

Chris is a Principal Consultant specialising in peatland risk management, monitoring and restoration design. Chris has extensive experience in the characterization of peatland condition and developing monitoring solutions from the site to the national scale. Chris has spent more than a decade working in academia and industry on a variety of research projects in areas such as hydrocarbon exploration, sedimentology, engineering geology, climate reconstruction, remote sensing and peatland science working collaboratively with Govt, NGO's and private sector clients to deliver peer reviewed publications, reports including as a member of scientific advisory committees.

1.5.1.5 Luke Moseley, MSc. (Carbon)

Luke is an experienced sustainability and carbon management professional with a strong track record in corporate and project-level climate strategy. He has led the management and analysis of sustainability data, authored climate chapters for Environmental Impact Assessments (EIAs), conducted GHG emissions inventories across Scope 1, 2 and 3, and developed a deep working knowledge of relevant policies, frameworks, and regulatory requirements for carbon reduction. With a specialism in land-based emissions, his MSc research focused on the opportunities and challenges of measuring and reporting emissions from land use and land use change.

1.5.1.6 Joe O'Reilly, MSc. (GIS)

Joe is a Senior GIS Analyst with over 6 years of experience in the development and implementation of spatial solutions. His experience includes desk-based assessments of ecosystem services and biodiversity; feasibility studies and opportunity mapping for renewable energy sources requiring the development of a bespoke assessment methodology based on best practice and the aims of the project; the synthesis and analysis of a wide array of social, economic and environmental datasets; and the visualisation of project outputs in dynamic decision-making tools.

2.0 Methods

This peatland restoration study is split into four steps, as detailed in the next sections. It aligns with commitments made in Chapter 5 as part of the ecology impact assessment and RWE's ambitions to have net-zero carbon emissions; and to work towards a nature positive impact[6].

2.1 Step 1: Determine the area of bog restoration required for compensation in terms of biodiversity (to reach at least net zero); and detailed habitat surveys.

To reach no net biodiversity loss in terms of peatlands for the Proposed Development some bog restoration will be required. To give confidence of net zero, a calculated 10% net gain is required. The 10% threshold functions as a precautionary buffer, ensuring that developments deliver genuine, real-world- net gains once uncertainty in the accuracy of the metric is taken into account[7]. The same concept of a buffer beyond estimated net-zero before biodiversity gains can be claimed, is adopted by the ICUN[8].

The first task in this study is to estimate the area of peatland restoration that is needed to reach robustly justifiable net zero impact. This requires firstly to establish a robust definition of bogs and peatlands and the parameters that should be included in biodiversity loss and gain calculations.

Based on our previous experience, for biodiversity the area of restoration should be in the region of 3-to-10-times the area lost. Irish guidance is absent however, more recent UK guidance and legislation such as the Statutory BNG metric and NatureScot policy (see Section 3.4.2.1), supports the higher compensation requirement of around 1:10 or higher. The recently released TII metric[9] was not available in time to inform this project. The TII metric is Ireland specific and broadly based on the Statutory Biodiversity metric. It was released in December 2025. It is not a statutory requirement and was designed for linear infrastructure projects rather than large renewable or blanket bog areas such as the Proposed Development. For these reasons, and as at the time of its release BNG calculations for the Proposed Development were largely complete, we have not used in for our calculations assessment. We do however make reference to it where appropriate.

2.1.1 Defining Bog and Peatlands in Ireland

There are key differences between the definitions of bog (largely vegetation based with some consideration of peat depth) and peatland (based on peat depth/ soil carbon content). These terms are not fully interchangeable. The EU nature restoration law for example considers peatlands even where these have been converted to agriculture and no longer support bog vegetation.

Relevant literature has been relied upon to define the most appropriate definitions of peatlands, bogs and Annex 1 habitats in the context of the Proposed Development. Sources are set out in Table 3-1. These consist of:

- National Peatlands Strategy. 2015. National Parks & Wildlife Service. Dublin[10];

[6] https://www.rwe.com/en/responsibility-and-sustainability/environmental-protection/biodiversity/

[7] https://www.nao.org.uk/wp-content/uploads/2024/05/implementing-statutory-biodiversity-net-gain-summary.pdf

[8] https://iucn.org/sites/default/files/2025-12/the-nature-positive-goal-and-the-mitigation-hierarchy.pdf

[9] https://cdn.tii.ie/publications/GE-ENV-01112-01.pdf

[10] https://www.npws.ie/sites/default/files/publications/pdf/NationalPeatlandsStrategy2015EnglishVers.pdf

- Food and Agriculture Organisation of the United Nations. 2020. Peatland mapping and monitoring, recomendations and techincal overview[11].
- Fossit.2000. A Guide to Habitats in Ireland[12];
- EUR28. 2013. Interpretation Manual of European Habitats[13]; and
- European Parliament. 2024. Regulations of the European Parliament and Council on nature restoration and amending Regulation (EU) 2022/869[14].

2.1.2 Step 1a: Habitat Surveys

The Main Wind Farm Development Site was surveyed classified according to Fossitt (2000)[15] and mapped according to the good-practice measures outlined in Heritage Council guidance (Smith et al., 2011[16]). The locations of any rare, threatened, legally protected or invasive plant species were mapped – with specific reference to any Floral Protection Order species or Schedule III invasive species. Furthermore, each habitat was assessed with reference to Annex I definitions and their supporting diagnostic criteria as set out in the EC (2013[17]) guidelines.

Survey work was undertaken in two phases. The Main Wind Farm Development Site and HEA were surveyed by Dr Alex Fitzgerald (refer to **EIAR Appendix 5-1**), while the three overrun areas were surveyed by Dr Andrew Torsney (refer to **EIAR Appendix 5-6**). Habitat extents were mapped using GIS to calculate the area of each habitat type present.

2.1.2.1 Habitat Condition Assessments – and Biodiversity Net Gain

Subsequent surveys were then undertaken for all Annex I Blanket Bog habitats on site. For the Main Wind Farm Development Site these were undertaken on the 11th and the 14th of November 2024 by SLR's Technical Director Andrew Torsney. The overrun area data was collected between 7th and the 8th of January 2026 also by SLR's Technical Director Andrew Torsney.

All surveys were undertaken in accordance with Irish Wildlife Manual No 128[18] and No.79[19]; full details of the survey methods and results can be found in **EIAR Appendix 5-9.**

The data collected was used to better understand the restoration potential and to facilitate Biodiversity Net Gain (BNG) calculations. As there are no condition assessments for cutover bog published in the IWM[8], TII biodiversity metric [46] condition assessments were not

[11] https://catalogue.unccd.int/1446_fao_peatlands_CA8200EN.pdf

[12] https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf

[13] https://www.mase.gov.it/sites/default/files/archivio/allegati/rete_natura_2000/int_manual_eu28.pdf

[14] https://data.consilium.europa.eu/doc/document/PE-74-2023-INIT/en/pdf

[15] Fossitt, J. A. (2000). *A guide to habitats in Ireland*. Kilkenny: Heritage Council.

[16] Smith, G. F., O'Donoghue, P., O'Hara, K. & Delaney, E. (2011) *Best Practice and Guidance for Habitat Surveying and Mapping*. Kilkenny: The Heritage Council

[17] European Commission (2013) Interpretation Manual of European Union Habitats – EUR28. Brussels: European Commission, DG Environment.

[18] Smith, G.F. & Crowley, W. (2020) The habitats of cutover raised bog. Irish Wildlife Manuals, No. 128. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

[19] Perrin, P.M., Barron, S.J., Roche, J.R. & O'Hanrahan, B. (2014). Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

available at the time, and to facilitate a BNG assessment if desired, habitat condition data were collected at the plots according to the UK Gov. Statutory BNG metric guidance[20].

2.1.2.2 Survey Extent and Effort – Main Wind Farm Development Site

Approximately 185 ha of peatland habitat (PB3 and PB4) were identified within the Main Wind Farm Development Site. In line with Irish Wildlife Manual (IWM) guidance, 16 monitoring plots would have been sufficient at this scale; however, 28 no. 2 × 2 m quadrats were undertaken to provide a more spatially representative and defensible dataset (further details can be found in **Technical Appendix 5-6** specifically **Figure 5-1** of that appendix).

Fourteen plots were located within the proposed development footprint and fourteen outside it, enabling direct comparison between impacted and non-impacted areas. Plot placement reflected seven discrete impact locations, with two plots positioned within each potential impact area and additional plots in surrounding habitat to provide contextual baseline data.

2.1.2.3 Survey Extent and Effort – Overrun Areas

Approximately 14.7 ha of peatland habitat were identified across the overrun areas (Appendix B: **Figure 1**). Based on area thresholds, four quadrats were required.

- Over-run Area 1: 4 quadrats.
- Over-run Area 3: 8 quadrats (increased effort due to mapping under Article 17 data[21]).
- Over-run Area 2: No peatland habitats identified at this location; all of the habitats are mosaics with some peated soil indicators but no peatlands therefore no Annex I peatland habitats. As such no annex I habitat condition assessment required.

2.1.2.4 Condition Assessment Methodology

At each monitoring stop, a 2 × 2 m quadrat was surveyed using vegetative identification techniques. All vascular plant species were recorded (nomenclature following Stace, 4th edition) and percentage cover estimated.

Annex I Blanket Bog [7130] condition assessment criteria were recorded at each quadrat and assessed both within the plot and within a 20 m radius, following IWM methodology.

For the Main Wind Farm Development Site, a parallel condition assessment using the DEFRA biodiversity metric was also completed. Although vegetation composition in places aligned with mosaics of Northern Atlantic wet heath [4010] and European dry heath [4030] on deep peat, Blanket Bog was treated as the primary target habitat given substrate depth and higher conservation value. The management objective is to achieve favourable condition of Blanket Bog over a 35-year period.

Rare or legally protected species (Flora Protection Order 1999) and Red-listed species were specifically considered during surveys and details of the results are also reported below.

[20] July 2024. The Statutory Biodiversity Metric – Technical Anex 1: Condition Assessment Sheets and Methodology (v1.0.2).

[21] NPWS (2019) *Article 17 GIS and Metadata Downloads*. Department of Housing, Local Government and Heritage, Dublin. Available at: NPWS Article 17 GIS and Metadata Downloads (Accessed: 15 August 2026).

2.1.3 Step 1b: Calculation of biodiversity loss

2.1.3.1 Determining Impact and Restoration Buffers

Based on the NatureScot peatland restoration guidance[19] and on the technical expertise of wetland hydrology (see Section 3.3.1).

2.1.4 Step 1c: Calculation of the area of Peatland Restoration Required for Biodiversity Compensation and Enhancement inc. which areas of the site should be prioritised for this.

In Ireland, there is no standard guidance on the area of bog restoration expected to provide compensation for losses of these habitats due to developments such as wind farms. The Ireland Peatland Standard[22] was not considered appropriate as its focus is on voluntary carbon markets rather than planning and development.

To establish what would be reasonable in this instance, we therefore reviewed relevant policy in England and Scotland; specifically, the UK Gov Statutory BNG metric[23], and NatureScot's: Advising on peatland, carbon-rich soils and priority peatland habitats in development management[24].

There are known challenges to these from a wind industry perspective, in particular as they lack the flexibility to account for significant variation in the difficulty and time needed for bog restoration in different contexts. We have therefore additionally reviewed the SSE Biodiversity Tool kit[25], which allows for more flexible specification of the difficulty and timescales expected to be associated with site specific habitat restoration efforts, and literature on bog restoration timescales and success in similar contexts to the Proposed Development Site (ditch blocking, on flat land, at low elevation). See Section 3.4.2.1 for details on the metric selection process and outcome (SSE biodiversity metric).

2.2 Step 2: Determine Carbon Benefit: Accounting for Sequestration by Restored Bog and Re-use of Excavated Peat

In a similar manner to section Step 1c, Ireland does not have standard documentation for bog restoration and re-use of excavated peat. Note that the Peatland Standard for Ireland[26] was published part way through this review being undertaken, however as it largely references international standards that we have taken into consideration, it was not considered separately.

Therefore, we reviewed the standard policy documentation for the UK, and the International Union for Conservation of Nature (IUCN) National Committee UK has published a Peatland Code Standard[27] that we reviewed. The document specifies requirements for the validation and verification of greenhouse gas emissions reduced via peat restoration projects. The carbon units accounted for in the Peatland Code account specifically for both greenhouse

[22] https://peatlandfinance.ie/peatland-standard

[23] https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides

[24] https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management

[25] https://www.sserenewables.com/sustainability/nature-positive/

[26] https://static1.squarespace.com/static/6453c38ea9ef3d5ed400982d/t/67c95dc94920d5365d5ac851/1741249993795/Peatland+Standard_V1.0+Doc+D.pdf

[27] Peatland Code V2.1 - Web Final-Sept 2025.pdf

gas emissions reduction from and sequestered by the restored peatland, excluding those already stored within the peatland, making it a suitable piece of guidance for these calculations.

Additionally, the IUCN has published the Peatland Code Field Protocol[28] which was reviewed. The standard guidance was found to be useful in further determining and validating the emission factors for the pre-restoration and post-restoration condition categories of the Proposed Development.

Finally, we have also reviewed the IUCN's Emission & Carbon Cost Calculator for bogs[29] which was found to be a satisfactory tool for completing the necessary calculations for the peat restoration, using the information from the Peatland Code Standard, Peatland Code Field Protocol and SSE Biodiversity Tool Kit reviewed in step 1c.

2.3 Step 3: Determine the total area that of bog that it is feasible to restore (re-wet) within the open ground on site, taking into account constraints such as infrastructure and ecological sensitivities.

This step was undertaken to determine the area of bog within the open areas of the Main Wind Farm Development Site and HEA (excluding forestry plantations), that it is realistic to restore to a better condition than recorded at baseline (Candidate Areas).

We reviewed the site hydrology including natural and artificial drainage. The Screening Process was prepared which involved reviewing available data against the following criteria within 250m of the Main Wind Farm Development Site and HEA boundary:

- Using the 5m Digital Terrain Model (DTM) data to identify areas where slopes are likely <4° for ideal conditions, below 6° for areas that benefit from restoration options and larger and linear areas greater than 6° which would provide limited restoration value;
- Natural waterbodies for consideration of mitigation requirements against any potential risk of working in the water environment;
- Infrastructure and associated drainage measures;
- Desk-based mapping of ditches and peat cutting faces from current aerial photography and validated it against historical aerial photography back to 1995 to identify features that would benefit from restoration methods; and
- The existing soil and peat data published and gathered during previous investigations to identify areas of peat in excess of 1 m deep.
    - To inform the peatland restoration plan, Candidate Areas were then screeded to determine the most appropriate restoration techniques to be adopted within each.

2.4 Step 4: Define the area of bog to be restored and provide an associated Habitat Management Plan.

We reviewed the outcomes of Steps 1 to 3 and used the information to produce a habitat management plan (HMP). This plan forms **Appendix A** to this document.

[28] FieldProtocol_V2.1_Final Website_0.pdf

[29] Protected - PC Bog Emissions & Carbon Costs Calculator PCv2.2 (Oct 25)_0.xlsx

3.0 Results

3.1 Step 1: Determine the area of bog restoration required for in-setting in terms of biodiversity (to reach at least net zero); and detailed habitat surveys.

3.1.1 Peatlands and Bogs Habitat Definitions

3.1.1.1 Overview

The terms peatlands and bogs are often used interchangeably. There are however important differences, and the definitions vary among associated legislation and guidance which further complicates the picture.

This section clarifies and justifies how we have defined peatlands and bogs habitats in the context of this report. The definitions from the key sources reviewed are provided in Table 3-1. They focus on the natural peatland habitats found on site, specifically blanket bog and wet heath.

Peatlands and Bog: The broad relationship between peatlands and bogs is illustrated in Figure 1. In general, “peatlands” refers to areas with peat/ peaty soils with any type of vegetation, and “bogs” refers to areas of peatland with only bog vegetation growing on it, thereby excluding areas of peatland that have for example been converted for agricultural or forestry use.

Deep Peat: The definitions of both peatlands and bogs can additionally rely on peat-depth depth thresholds for deep and shallow peat. Again, these thresholds vary among guidance documents even within the UK and Ireland. Deep peat definitions, in the context of ecology, range from a minimum depth of 30cm in England to 50cm in other regions e.g. Scotland. In Ireland it ranges from 30 to 50cm (general rule not strict threshold).

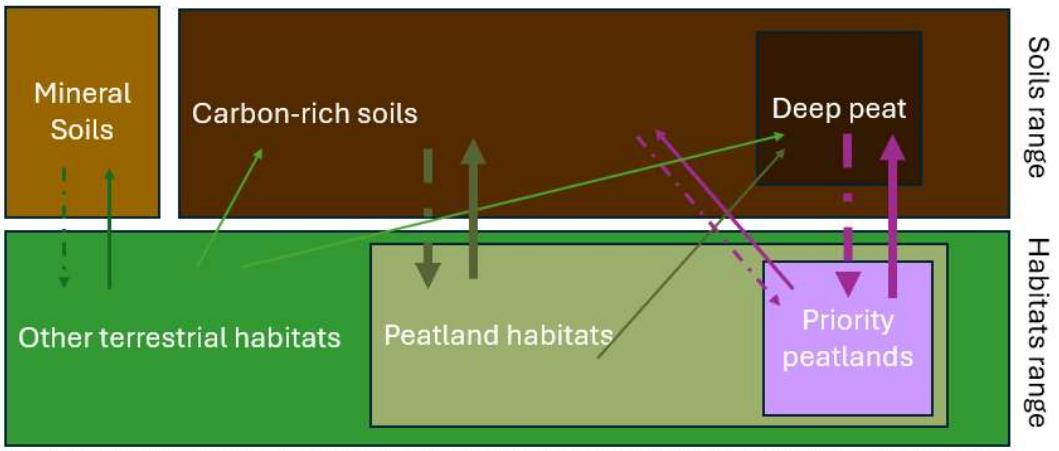

Figure 1: Illustration of Habitat and Soils Relationships

Table 3-1:Definitions of Peatlands and Bogs

Source	Term	Definition
National Peatland Strategy (NPS)[30]	Peat Soils	Soil that contains peat over a depth of at least 45 cm on undrained land and 30 cm on drained land; the depth requirement does not apply in the event that the peat layer is directly over bedrock.
	Active or peat forming	According to the Interpretation Manual of the Habitats Directive, the term Active must be taken to mean still supporting a significant area of vegetation that is normally peat forming.
	Peat	Sedentarily accumulated material consisting of at least 30% (dry mass) of dead organic material.
	Peatland	A geographical area (with or without vegetation) where peat soil occurs naturally. For mapping purposes, a peatland should cover a minimum spatial extent of 1 ha.
	Intact, pristine and virgin peatlands	The terms 'virgin', 'pristine' and 'intact' have been used in several studies in relation to sites that look unmodified, uncut (as visible to the eye) and where no obvious factor is currently degrading the peatland. These terms are best avoided for use of habitat description such as peatlands in an Irish context. Most Irish peatlands are 'humanised' landscapes that have evolved, indeed sometimes originated, in close association with land-use systems. It would be impossible to find an Irish peatland that has never been grazed or used in some way by humans (e.g. burning).
	Near-intact peatland	In this report (NPS), the terms 'near-intact' and 'natural' peatlands are interchangeable and are used to refer to peatlands that are hydrologically and ecologically intact, i.e. in which the eco-hydrology, in the recent past, has not been visibly affected by human activity and therefore includes active or peat-forming areas or is in the process of regenerating such a habitat. A natural peatland thus requires a combination of components to be present in order to carry out all the functions and ecosystem services usually attributed to such ecosystems.
	Priority habitat	A subset of the habitats listed in Annex I of the EU Habitats Directive. These are habitats that are in danger of disappearance and whose natural range mainly falls within the territory of the European Union. These habitats are of the highest conservation status and require measures to ensure that their favourable conservation status is maintained.
FOA[7]	Peatland	land with organic soil >0.1m depth with 12-18% carbon by weight and 20-30% organic matter.
A guide to habitats in Ireland[31]	Bogs	Peat depths can be used to differentiate blanket bog and heath in situations where the vegetation cover has been altered or removed (e.g. overgrazed or burnt). As a general rule, peat depths of greater than 0.5 m are indicative of blanket bog while those of less than 0.5 m are indicative of heath, but there are exceptions.

[30] National Peatlands Strategy. 2015. National Parks & Wildlife Service. Dublin. https://www.npws.ie/sites/default/files/publications/pdf/NationalPeatlandsStrategy2015EnglishVers.pdf

[31] Fossit.2000. https://www.npws.ie/sites/default/files/publications/pdf/A%20Guide%20to%20Habitats%20in%20Ireland%20-%20Fossitt.pdf

Source	Term	Definition
	Upland Blanket bog PB2	Vegetation is typically dominated by Deergrass (*Trichophorum caespitosum*), cottongrasses (*Eriophorum spp.*) and dwarf shrubs. Cover of Sphagnum mosses is usually high in areas of undamaged bog. Peat depths in **excess of 0.5 m** are **usually** indicative of blanket bog. Heath Rush (*Juncus squarrosus*) and Green-ribbed Sedge (*Carex binervis*) may occur in wet heath - HH3[32] but not in upland blanket bog.
	Lowland blanket bog PB3	Peat depths **vary considerably (1.5-7 m)** depending on the underlying topography, and are **usually** intermediate between those of raised bog - PB1 and upland blanket bog - PB2. As is the case with upland blanket bog, only the areas of uncut bog are included in this category; where part of the bog has been removed through turf cutting or any other form of peat extraction, this should be recorded as cutover bog - PB4.
	Cutover bog PB4	This category should be used in situations where part of the original mass of peat has been removed through turf cutting or other forms of peat extraction.
	Wet heath HH3	Heath includes areas where the vegetation is open and there is at least 25% cover of dwarf shrubs, or where mosses dominate in the case of some montane areas. If the underlying soil is peat, peat depths of **less than 0.5 m** are usually, but **not always**, indicative of heath.
Interpretation Manual of European Habitats[33]	Blanket bog – Annex 1	7130 Habitats Directive Annex 1[34] habitat (Priority if active). Extensive bog communities or landscapes on flat or sloping ground with poor surface drainage, in oceanic climates with heavy rainfall, characteristic of western and northern Britain and Ireland. In spite of some lateral water flow, blanket bogs are mostly ombrotrophic[35]. *Sphagna* play an important role in all of them but the cyperaceous component is greater than in raised bogs. The term "active" must be taken to mean still supporting a significant area of vegetation that is normally peat forming. *Note: the above definition does not reference a peat depth threshold*.
	Wet heath	4010 Northern Atlantic wet heaths with Erica tetralix: Humid, peaty or semi-peaty heaths, other than blanket bogs, of the Atlantic and sub-Atlantic domains. 4020 * Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix: Hygrophilous heaths of areas with a temperate oceanic climate, on semi-peaty or dried-out soils, with surface minerals in the case of peaty soils (hydromor), with vegetation of the alliances Genistion micrantho-anglicae and Ulicion minoris.

[32] HH3 = wet heath

[33] EUR28. 2013. Interpretation Manual of European Habitats. https://www.mase.gov.it/sites/default/files/archivio/allegati/rete_natura_2000/int_manual_eu28.pdf

[34] Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, O.J. L206, 22.07.92

[35] Ombrotrophic = rain fed (not groundwater dependant)

Source	Term	Definition
		Note: the above definition does not reference a peat depth threshold. It clarifies that these habits may occur on semi-peat soils rather than being strictly restricted to peat habitats.
EU nature restoration law[36]	Peatland	The EU nature restoration law provides no clear definition of peatland but does refer to the definition in 2006 IPCC[37] guidance for National Greenhouse Gas Inventories. This IPCC guidance states that: "An organic soil is a soil with a high concentration of organic matter (see below). Every soil that is not an organic soil is classified as a mineral soil, following the 2006 IPCC Guidelines (Annex 3A.5, Chapter 3 in Volume 4). The Wetlands Supplement follows the definition of organic soils in the 2006 IPCC Guidelines (Annex 3A.5, Chapter 3 in Volume 4): Organic soils are identified on the basis of criteria 1 and 2, or 1 and 3 listed below (FAO 1998): 1. Thickness of organic horizon greater than or equal to 10 cm. A horizon of less than 20 cm must have 12 percent or more organic carbon when mixed to a depth of 20 cm. 2. Soils that are never saturated with water for more than a few days must contain more than 20 percent organic carbon by weight (i.e., about 35 percent organic matter). 3. Soils are subject to water saturation episodes and has either: a. At least 12 percent organic carbon by weight (i.e., about 20 percent organic matter) if the soil has no clay; or b. At least 18 percent organic carbon by weight (i.e., about 30 percent organic matter) if the soil has 60% or more clay; or c. An intermediate proportional amount of organic carbon for intermediate amounts of clay." The 2006 IPCC Guidelines largely follow the definition of Histosols by the Food and Agriculture Organization (FAO), but have omitted the thickness criterion from the FAO definition to allow for often historically determined, country-specific definitions of organic soils. There are no IPCC definitions for peat and peatland. Definitions of peatland and peat soil differ between countries in relation to the thickness of the peat layer required to be determined as a peatland or a peat soil. In addition, the definition of peat varies among countries and disciplines, especially with respect to the minimum percentage of organic matter the material is required to contain (Joosten and Clarke, 2002). In the Wetlands Supplement the concept of peatland is considered to be included in '(land with) organic soil'.

[36] Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869 https://data.consilium.europa.eu/doc/document/PE-74-2023-INIT/en/pdf

[37] Intergovernmental Pannel on Climate Change

Source	Term	Definition
		It is good practice that, when a country uses another definition of organic soil in accordance with its national circumstances, the concept of organic soil (and its possible subdivisions) applied is clearly defined, and that the definition is applied consistently both across the entire national land area and over time [38].

[38] IPCC. 2013. Supplement to the 2006 IPCC Guidance for National Greenhouse Inventories: Wetlands: https://www.ipcc.ch/site/assets/uploads/2018/03/Wetlands_Supplement_Entire_Report.pdf

3.1.1.2 Definitions in Relation to this Proposed Development

Table 3-1 focuses on definitions of peatlands, bogs and associated terminology from relevant Irish and international legislation and associated guidance. Based on the information in those definitions we have defined peatlands, bogs and deep peat in relation to this project as follows:

Peatland

As the EU Nature Restoration law, via its reference to IPCC definitions of peatlands, supports using national definitions of peatland (Table 3-1)., this report bases its definitions of peatland/ peat soils on the National Peatland Strategy (for text see Table 3-1), as follows:

- Peatlands by this definition have no minimum depth over bedrock and a minimum depth of 30cm-45cm over sediments.

Note that as the Main Wind Farm Development Site and HEA are underlain by bedrock, anywhere that peat of any depth occurs is considered a peatland. The Main Wind Farm Development Site and HEA support peat and are therefore considered a peatland. In addition, at its shallowest the peat recorded is >45cm and therefore is considered peatland even were the peat to be underlain by sub-soil rather than bedrock. In general peat depth is in the range of 2m to 4m and in some places >6m deep.

Bog

Irish habitat classification guidance[26] permits for exceptions to a general rule of thumb of blanket bogs occurring on peat >50cm. In addition the Interpretation Manual of European Habitats, which is the source of definitions for Annex 1 habitats, has no minimum peat depth threshold in relation to bogs with key differences between bog and wet heath being reflected by vegetation composition as well as soil type and depth (Table 3-1). We have therefore taken the approach of not requiring a minimum peat depth for bog habitats as this approach definition is best aligned with definitions of Annex 1 habitats. Shallower areas of peat (<50cm), are classified as wet heath if they supported appropriate plant communities.

In reality, as the peat on the Main Wind Farm Development Site and HEA is a minimum of 50cm both the Irish habitat classification and Annex 1 definitions of bog are met anywhere there is bog vegetation.

- Bog = any depth of peat (but typically >50cm), supporting bog vegetation. Based on the description in Interpretation Manual of European Union Habitats (v., 28)[33] bog habitats (blanket bog, raised bog and lowland bog) are Annex 1 habitats, except perhaps in a few circumstances where they are so badly degraded that they could no longer support Sphagnum species. While the habitat description references other species/ communities/ characteristics that are “often” associated with blanket bogs, Sphagnum spp. are described as “playing an important role in all of them”.
- Priority Annex 1 bog = bog habitat “*supporting a significant area of vegetation that is normally peat forming*”[28, 16]. We have used the NatureScot guidance and the Interpretation Manual of European Union Habitats (v., 28)[39] to determine if habitats qualify as Priority Annex 1 bog[40]. Only those areas achieving near natural condition have been included.

[39] https://eunis.eea.europa.eu/references/2435

[40] https://www.nature.scot/sites/default/files/2023-02/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf

3.2 Step 1a: Detailed habitat surveys

Survey work was undertaken in two phases (see Chapter 5). The main wind farm area was surveyed by Dr Alex Fitzgerald (refer to **EIAR Appendix 5-1**), while the three overrun areas were surveyed by Dr Andrew Torsney (refer to **EIAR Appendix 5-6**). For reference the locations of these areas are shown in Figure 2. Habitat extents were mapped using GIS to calculate the area of each habitat type within the Main Wind Farm Development Site.

Subsequent surveys were then undertaken for all Annex I Blanket Bog habitats on site. For the Main Wind Farm Development Site these were undertaken on the 11th and the 14th of November 2024 by SLR's Technical Director Andrew Torsney. The overrun area data was collected between 7th and the 8th of January 2026 also by SLR's Technical Director Andrew Torsney.

All surveys were undertaken in accordance with Irish Wildlife Manual No 128[41] and No.79[42]; full details of the survey methods and results can be found in **EIAR Appendix 5-9.**

The data collected was used to better understand the restoration potential and to facilitate Biodiversity Net Gain (BNG) calculations. As there are no condition assessments for cutover bog published in the IWM[8], TII biodiversity metric [46] condition assessments were not available at the time, and to facilitate a BNG assessment if desired, habitat condition data were collected at the plots according to the UK Gov. Statutory BNG metric guidance[43].

[41] Smith, G.F. & Crowley, W. (2020) The habitats of cutover raised bog. Irish Wildlife Manuals, No. 128. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

[42] Perrin, P.M., Barron, S.J., Roche, J.R. & O'Hanrahan, B. (2014). Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

[43] July 2024. The Statutory Biodiversity Metric – Technical Anex 1: Condition Assessment Sheets and Methodology (v1.0.2).

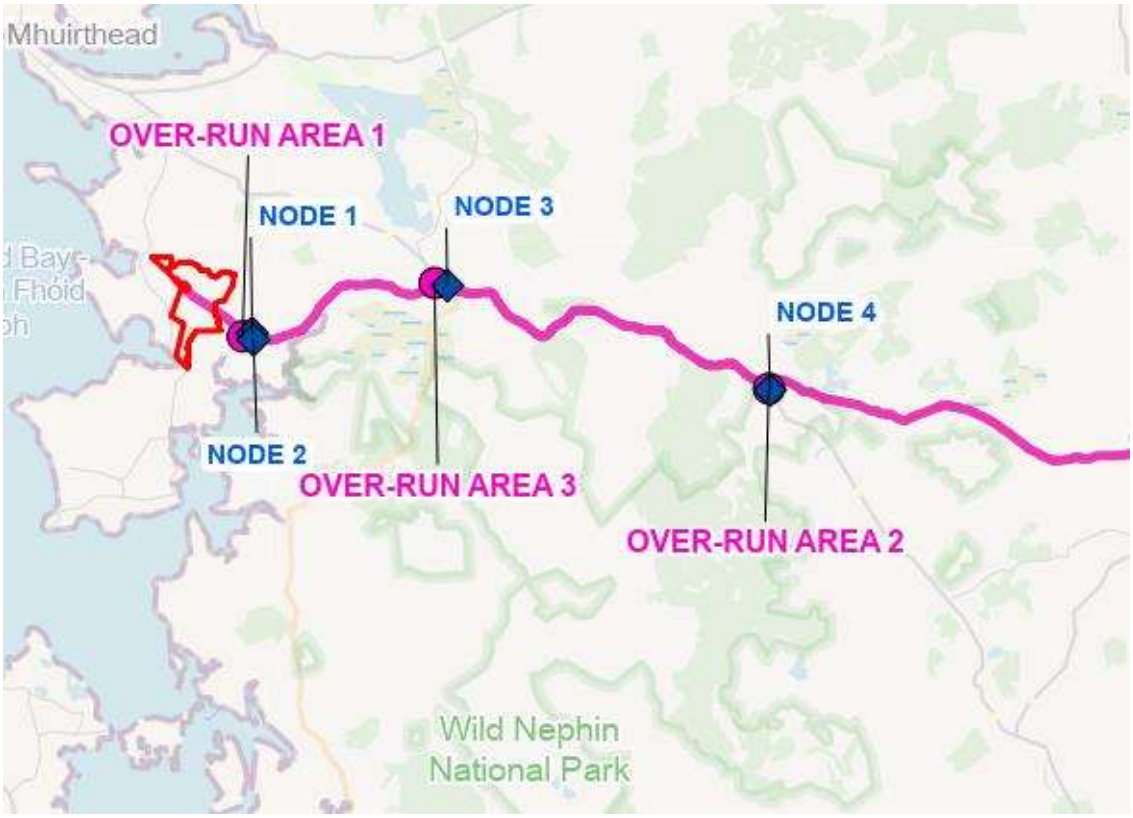

Figure 2: Site Location and over-run areas (see Chapter 2, Figure 2-4a for full details)

3.2.1 Peatland Habitat Types

Most of the open areas were mapped as cutover bog (PB4) according to the Fossitt system (Table 3-2; Drawing 1). Although, the community composition was initially noted to be more consistent with wet heath (HH3) than lowland blanket bog (PB3), on review in light of the drained condition of the area, the vegetation was mapped as PB4 (cutover bog) recognising that due to peat drying it represents highly modified PB3 vegetation that is restorable to good condition bog on re-wetting.

A summary of the habitats on the Main Wind Farm Development Site and HEA including blanket bog and other Annex I habitats is provided in Table 3-2. For ease of comparability, if desired, we have also provided a conversion to the UKHab vegetation classification codes [44]. Drawing 01, shows the distribution of habitats across the site.

The larger polygons of blanket bog within the turbine area are listed in Table 3-1 and separately to give a better understanding of the locations of habitat losses, other polygons are merged based on habitat type and condition.

A summary of the main habitats in the over-run areas is provided at the bottom of Table 3-2.

[44] https://www.ukhab.org/

Table 3-2: Summary of Habitats Recorded On the Main Wind Farm Development Site, HEA and Over Run Areas

Polygon (s)	Fossitt	UKHab (For mosaics the polygon is coded as the dominant habitat)	UKHab Condition[45]	Annex I	Priority Annex I	Total Area (ha)
57, 69	BL3 Buildings and artificial surfaces	U1b Develop land sealed surface	*NA*	No	No	1.25
27, 55	FL2 Acid oligotrophic lakes	R1c Oligotrophic and dystrophic lakes	*Moderate*	3110 3030	No	0.30
31, 60	FL8 Other artificial lakes and ponds	R1g Other standing water	*Moderate*	No	No	0.06
59, 61, 63 - 65	FS1 Reed and large sedge swamps	F2d Aquatic marginal vegetation	*Moderate*	No	No	0.36
67	FW1 Eroding/upland rivers	R2b Other rivers and streams	*Moderate*	No	No	0.37
56	GS3 Dry-humid acid grassland	G1b Upland acid grassland	*Moderate*	No	No	0.17
8-10, 19,24,35,36	GS4 Wet grassland	G3c8 Holcus Juncus Neutral Grassland (15)	*Moderate*	No	No	6.63
2	GS4 Wet grassland GS3 Dry-humid acid grassland	**G3c8 Holcus Juncus Neutral Grassland (15)** G1b Upland acid grassland	*Moderate*	No No	No	0.52
33	GS4 Wet grassland ED3 Recolonising bare ground WS1 Scrub	**G3c8 Holcus Juncus Neutral Grassland (10, 15, 510)** G3c (510) Other neutral grassland H3h Mixed scrub	*Moderate*	No No No	No	2.96
26	GS4 Wet grassland PB4 Cutover bog WS1 Scrub	**G3c8 Holcus Juncus Neutral Grassland (10, 15)** F1a6 Degraded blanket bog H3h Mixed scrub	*Moderate*	No **7130** No	No	2.11

[45] Classifications in italics are desk-based due to access issues the remainder are all field-based.

Polygon (s)	Fossitt	UKHab (For mosaics the polygon is coded as the dominant habitat)	UKHab Condition[45]	Annex I	Priority Annex I	Total Area (ha)
3	GS4 Wet grassland PF2 Poor fen and flush PB4 Cutover bog	**G3c8 Holcus Juncus Neutral Grassland (15)** F2a Lowland fens F1a6 Degraded blanket bog	*Moderate*	No No **7130**	No	0.65
4	GS4 Wet grassland WS1 Scrub	**G3c8 Holcus Juncus Neutral Grassland (10,15)** H3h Mixed scrub	*Moderate*	No No	No	2.05
29	GS4 Wet grassland WS1 Scrub HD1 Dense bracken	**G3c8 Holcus Juncus Neutral Grassland (10,15)** H3h Mixed scrub G1c Bracken	*Moderate*	No No No	No	1.78
18	HD1 Dense bracken WS1 Scrub GS4 Wet grassland	**G1c Bracken (10)** H3h Mixed scrub G3c8 Holcus Juncus Neutral Grassland (15)	*Poor*	No No No	No	1.21
1, 12, 14, 20, 25, 32	PB3 Lowland blanket bog	F1a5 Blanket bog	*Moderate*	**7130**	**Yes[46]**	22.55
37	PB4 Cutover bog	F1a6 Degraded blanket bog	*Poor*	**7130**	No	41.32
38	PB4 Cutover bog	F1a6 Degraded blanket bog	Moderate	**7130**	No	8.19
39	PB4 Cutover bog	F1a6 Degraded blanket bog	*Poor*	**7130**	No	15.51
41	PB4 Cutover bog	F1a6 Degraded blanket bog	*Poor*	**7130**	No	4.70
42	PB4 Cutover bog	F1a6 Degraded blanket bog	*Poor*	**7130**	No	5.88

[46] **PB3 – Priority Annex I status**: Where PB3 occurs in larger areas, is illustrated as Priority Annex I habitat in the Irish landcover database and we have confirmation of peat forming species from field survey this habitat is considered to be Priority Annex I habitat. Note however that the polygons of PB3 within the Main Wind Farm Development Site are not shown on the Irish landcover database, are small and therefore are not considered extensive enough to meet the definition of priority Annex I bog which is: *"still supporting a significant area of vegetation that is normally peat forming"*. The priority Annex I bog area is considered to be restricted to the triangle to the northwest where bog restoration work and no infrastructure is planned.

Polygon (s)	Fossitt	UKHab (For mosaics the polygon is coded as the dominant habitat)	UKHab Condition[45]	Annex I	Priority Annex I	Total Area (ha)
43	PB4 Cutover bog	F1a6 Degraded blanket bog	Moderate	**7130**	No	37.29
44	PB4 Cutover bog	F1a6 Degraded blanket bog	*Moderate*	**7130**	No	3.5
45	PB4 Cutover bog	F1a6 Degraded blanket bog	Poor	**7130**	No	21.35
46	PB4 Cutover bog	F1a6 Degraded blanket bog	Moderate	**7130**	No	30.84
47	PB4 Cutover bog	F1a6 Degraded blanket bog	Poor	**7130**	No	25.67
28, 40	PB4 Cutover bog	F1a6 Degraded blanket bog	*Moderate*	**7130**	No	0.98
50	PB4 Cutover bog WS1 Scrub	**F1a6 Degraded blanket bog (10)** H3h Mixed scrub	Moderate	**7130**	No	38.31
51 – 54, 66	PB4 Cutover bog WS1 Scrub	**F1a6 Degraded blanket bog (10)** H3h Mixed scrub	*Moderate*	**7130**	No	22.03
17,23, 62	PF3 Transition mire and quaking bog	F2c8 Transition mire and quaking bog	*Moderate*	**7140**	No	0.42
5 - 7	WD4 Conifer plantation	W2c Other coniferous woodland	*Poor*	No	No	59.09
16	WD4 Conifer plantation ED3 Recolonising bare ground GS4 Wet grassland	**W2c Other coniferous woodland (510)** G3c (510) Other neutral grassland G3c8 Holcus Juncus Neutral Grassland (15)	*Poor*	No No No	No	110.84
30, 34, 48, 49, 58	WS1 Scrub	**H3h Mixed scrub**	*Moderate*	No	No	4.78
11, 13	WS1 Scrub GS4 Wet grassland	**H3h Mixed scrub** G3c8 Holcus Juncus Neutral Grassland (15)	*Moderate*	No No	No	1.76
15	WS1 Scrub GS4 Wet grassland PB4 Cutover bog	**H3h Mixed scrub** G3c8 Holcus Juncus Neutral Grassland (15) F1a6 Degraded blanket bog	*Moderate*	No No **7130**	No	2.16
Over- run area 1	WS1 Scrub	**H3h Mixed scrub**	*Poor*	No	No	0.56

Polygon (s)	Fossitt	UKHab (For mosaics the polygon is coded as the dominant habitat)	UKHab Condition[45]	Annex I	Priority Annex I	Total Area (ha)
	PB3 Lowland blanket bog	F1a5 Blanket bog	*Good*	Yes	No	4.69
Over-run area 2	BL3 Buildings and artificial surfaces	U1b Develop land sealed surface	*NA*	No	No	0.817
	Mosaic - PB3 Lowland blanket bog/ GS2 - Dry meadows and grassy verges/ WS1 - Scrub	F1a5 Blanket bog	*Poor*	No	No	0.429
	GS2 Dry meadows and grassy verges	G1a Lowland dry acid grassland	*Poor*	No	No	0.089
	FW4 Drainage ditches		*poor*	No	No	0.214
Over-run area 3	PB4 Lowland blanket bog	F1a5 Blanket bog	*Good*	Yes	Yes	0.695

3.2.2 Habitat Condition

This Section refers to results of the survey undertaken using UK Gov. Statutory BNG metric guidance[22]. This method of condition assessment was adopted in this instance as it is the method set out in both the SSE and Statutory BNG metric guidance (see Section 3.4.2.1 for more information on BNG).

Based on the habitat condition report[47], blanket bog habitats on the Main Wind Farm Development Site are in Poor or Moderate Condition.

In addition, all of the blanket bog on the Main Wind Farm Development Site is considered to be drained according to NatureScot peatland condition criteria. Only one area where no habitat loss is expected is considered to be Priority Annex 1 blanket bog habitat, this is within the HEA.

Condition surveys were specifically targeted at bog habitats which are Annex 1 habitats (Table 3-2).

Condition data were not collected for other habitat types. Based on opportunistic field notes and photographs these habitats are considered to be in moderate condition, with the exception of habitats for which a moderate score is not achievable, including areas of bracken, commercial forestry and tracks/ buildings all of which are rated as Poor or condition assessment NA based on the UK Gov. Statutory BNG metric guidance[22].

For ease of reference a summary of the condition assessment results are set out in Table 3-3. Scoring of bog condition is defined as follows:

- Good Condition:
  - Passes 5 or 6 of 6 core criteria, INCLUDING essential core criterion 1; AND
  - Passes additional criterion 7a, 7b, 7c OR 7d where applicable.
  - Moderate Condition:
  - Passes 4 or 5 of 7 criteria; OR
  - Passes 6 of 7 criteria EXCLUDING either essential core criterion 1 or additional criterion 7.
- Poor Condition:
  - Passes 0, 1, 2 or 3 of 7 criteria.

The bog habitat on the Main Wind Farm Development Site passed 4 criteria at most locations, not including essential criterion 1. Most polygons are therefore in moderate condition. However, in a 4/8 polygons (Table 3-3), Sphagnum moss cover is particularly low e.g. 10-15% cover and therefore these polygons do not meet the criteria for frequent Sphagnum moss. These polygons are in poor condition.

Table 3-3: Uk Gov. Statutory BNG metric - Bog Habitat Condition Criteria

No.	Description	Achieved Y/N[48]	Notes
1	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,	N (8/8)	Active drains are present

[47] SLR Consulting. 2024. Habitat Condition Assessment. Muingmore Windfarm. 501.V00727.00008 Rev. 00

[48] (x/x) = number of polygons assessed where this result was true. If not true, then the opposite e.g. No rather than yes was the outcome.

No.	Description	Achieved Y/N[48]	Notes
	unless specifically to maintain water levels as specified above. NB – this criterion is essential for achieving good condition.		
2	The appearance and composition of the vegetation closely matches characteristics of the specific wetland habitat type (see UKHab definition linked above). Indicator species for the specific wetland habitat type 1 are very clearly and easily visible.	Y (8/8)	Typically GB2E according to the IVC classification system - Calluna vulgaris–Eriophorum spp. Which aligns with M17 bog vegetation dominants: cross-leaved heath, hare's-tail bog-cotton, heather, purple moor-grass & bog-mosses (Sphagnum spp.).
3	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.	Y (8/8)	
4	Cover of scrub and scattered trees less than 10%.	N (8/8)	
5	Cover of bare ground less than 5%.	Y (8/8)	
6	There is an absence of invasive non-native species (as listed on Schedule 9 of WCA, 1981) and species indicative of sub-optimal condition1 make up less than 5% of ground cover.	N (8/8)	
7	Sphagnum and cotton grasses are at least frequent. Cover of ericaceous dwarf-shrubs is less than 75%.	Y (4/8)	No = <15% cover of sphagnum

3.2.2.1 Habitat Condition: Over-run areas

3.2.2.2 Area 1

This area is PB3 blanket bog, however Sphagnum moss cover is too low for it to be considered in active condition, it is therefore considered Annex 1 but not priority Annex 1 habitat. Enough habitat condition criteria are met however for it to be considered to be in good condition.

Linear features in this area are fencelines or channels that are very minimal in dimension and are unlikely to be contributing to significant drainage of the area.

3.2.2.3 Area 2

Area 2 is not dominated by peatland or bog habitats. These habitats are a mosaic of disturbed or heavily modified habitats that have mixed sediment types included peated soils but the habitats do not align with peatland habitats. In line with survey notes indicate these habitats are in poor condition.

3.2.2.4 Area 3

Area 3 is largely mapped as cutover bog (PB4), it is de-vegetated (rotivated) and therefore assessed as being in poor condition. Desk study data show it is included in the area mapped under Article 17 as blanket bog, to reflect this in BNG calculations we have used a condition multiplier of three.

3.2.3 Restoration Potential

Drainage is likely responsible for the Main Wind Farm Development Site failing to meet the water table criteria (Criteria 1: Table 3-3) and consequently lower cover of Sphagnum than would be expected in wetter ground conditions. Ditch blocking is anticipated to rectify this. Other failures to meet condition criteria are in relation to cover of invasive species and scrub (Criteria 4 and 6). These can be removed, and re-wetting/ ditch blocking is likely to deter their growth. It is anticipated therefore be reasonably straight forward to get the Main Wind Farm Development Site to a state where it passes six to seven criteria Table 3-3 including critical criteria for the water table and Sphagnum cover and would therefore be in good condition.

An exception is the HEA where the drainage pattern is different. This area is PB3 lowland blanket bog that has been cutover bog rather than being drained by ditches. It is largely revegetated, restoration in this area would require re-profiling of the cutting faces (Section 3.6).

Restoration Potential: Over-run areas

3.2.3.1 Area 1

There is no clear restoration potential beyond reinstatement of any areas that are damaged due to the Proposed Development.

3.2.3.2 Area 2

This area represents a mosaic of grassland, scrub and heath habitats with some wetter areas, on mixed soils. It is heavily influenced by surrounding road infrastructure. Small biodiversity enhancements will be possible via floral enrichment from wildflower seeding and low-density scrub planting during the reinstatement process. Based on typical time to target conditions associated with the SSE metric and the conditions on site, we have assumed that **dry grassland** will reach **moderate compared to the current poor** condition post re-statement.

3.2.3.3 Area 3

It is unclear what restoration will be practical here as the wider area is undergoing a land-management transition. Consequently, we have assumed on a precautionary basis that no restoration will take place within Area 3. Therefore, loss due to the temporary track installed as part of the Project is treated as permanent. This is on a precautionary basis for the purpose of this assessment, even though the track is temporary and will be removed following completion of the construction phase.

3.3 Step 1b: Calculation of Habitat Loss and Restoration Areas

3.3.1 Habitat Loss

These calculations reflect potential loss of peatlands and other habitats. The calculations here are to provide an estimate of the likely extent of bog restoration required to compensate for loss of peatland and other habitats in relation to their biodiversity value and to achieve biodiversity enhancement at a site level.

3.3.1.1 Definitions of direct and indirect loss

Direct loss = habitat will be replaced by infrastructure.

Indirect loss/ degraded = habitat will be retained but is likely to be damaged e.g. by construction activities or degraded e.g. due to changes in hydrology/ drying caused by the construction of nearby infrastructure.

We have assumed that for bog habitats, the habitats will remain as the same habitat type rather than being lost or transitioning to another habitat type (e.g. from blanket bog to dry heath). As the majority of the Main Wind Farm Development Site is already highly drained blanket bog we consider this to be a realistic assumption. The condition may however be reduced due to drainage features associated with the infrastructure. Other habitats will return to their baseline condition following reinstatement works.

Condition is quantified as described in Section 3.2.2.

3.3.1.2 Impact Buffers

Where infrastructure requires excavations or loading of the peatland surface (e.g. with floating roads), this is likely to cause changes to the local hydrology, typically dewatering or diverting water from of surrounding peatland areas. The distance that this is likely to extend around the infrastructure needs to be estimated to inform indirect loss calculations.

NatureScot guidance[23] on the buffers of infrastructure state that the same buffers should be used for impact and restoration, it indicates that typically this is 30m but notes that topography, drain size and depth, and the presence of other drainage factors can have an influence (e.g. bulk density of peat and underlying geology). Based on our past experience of other wind farm projects in peatlands, 10m has been acceptable of areas of shallower or degraded peat.

In the case of the Main Wind Farm Development Site however, there are drainage ditches at roughly 5m spacing and peat within these ditches remains very wet. We therefore consider it unlikely that drainage impacts from infrastructure will extend much past 5m in any direction. Based on guidance and professional judgment, a 5m indirect loss buffer is appropriate in this instance.

3.3.1.3 Restoration Buffers

Similarly to the indirect impact buffer, with the exception of the outer most ditches, we consider it unlikely that the benefits of restoration of a single ditch will extend much past 5m in any direction due to the 5m ditch spacing. Based on guidance and professional judgment, a 5m restoration buffer is appropriate in this instance, with 30m applied to the outermost ditches where this lies within the Main Wind Farm Development Site.

In line with NatureScot guidance, re-wetting may not be fully effective within 30m of new and existing infrastructure due to their associated drainage features and that bog in these areas may not be practical. Areas within 30m of proposed infrastructure are therefore excluded from what is considered to be the restorable area. This is precautionary, as in reality, it is likely that these areas would experience some improvement in condition making this a precautionary approach.

An exception is the HEA to the northwest where the drainage pattern is different. This area is modified by cutover. Restoration in this area would require re-profiling of the cutting face to achieve an angle closer to 30 degrees, compacting the peat and stretching the vegetation layer across the face of the reprofiled area, compacting it to ensure a good contact between the roots and peat.

No impacts are anticipated in this area. The restoration buffer we have used reflects guidance on restoration buffers for hag re-profiling which is 30m either side from the cutting face.

3.3.1.4 Approach to Temporary Loss

Within the over-run areas the infrastructure will be temporary, its purpose is to facilitate delivery of materials and parts during construction and it will therefore be redundant post-construction. Note however that over-run Area 3 is to be treated a permanent loss see Section 3.2.3.

BNG guidance[49] advises the following in relation to temporary loss (Box 1). The BNG relevant construction period at Muingmore is expected to last 23 months (ground clearance to reinstatement). This means that even low distinctiveness, poor quality habitats, which have experienced direct-loss such as improved grassland will not have reached their baseline condition and type within the two BNG year exemption window. Areas of temporary loss will therefore be incorporated into BNG in a two stage (time window) process:

Stage 1 - **Baseline to during construction**: Loss (direct and indirect) will be entered into one spreadsheet to estimate losses.

Stage 2 **– End construction to post-restoration**: Habitat creation (reinstatement) and enhancements will be entered into one spreadsheet to estimate gains.

The Biodiversity Unit calculations from these spreadsheets were combined with the results from the Main Wind Farm Development Site and HEA to give an overall biodiversity change estimate for the Proposed Development.

Accounting for temporary losses

You do not need to record a habitat as lost when there are temporary impacts to a habitat and the area can be restored to both:

- *baseline habitat type within two years of the initial impact; and*
- *baseline condition within two years of the initial impact*

You can enter these habitats as 'enhanced' if there is action to enhance the habitat above its baseline type and condition. If you do, you should apply a 1- or 2-year delay in starting habitat creation or enhancement.

Box 1: BNG Guidance Temporary Loss

3.3.1.5 Indirect Loss/ Gain Buffer Assumptions: Over-run Areas

All areas of indirect loss/ gain are bounded by existing infrastructure such as roads.

Damage to habitats within 5m of infrastructure due to plant movements is anticipated both during construction and reinstatement, therefore no meaningful recovery of these areas is anticipated during Stage 1 (see Section 3.3.1.4 for a description of Stages).

See Section 3.4.2.2 for discussion on bog recovery timescales. Note that the areas in question are accessible and flat and are therefore considered to be straight-forward to restore compared to high-altitude or sloping sites, given the proper treatment.

[49] https://assets.publishing.service.gov.uk/media/689c5ee17b2e384441636196/The_Statutory_Biodiversity_Metric_-_User_Guide_-_July_2025.pdf

3.3.1.6 Area 1

This area is predominantly blanket bog in good condition. Although ditches are present, they are well spaced, insubstantial (barely noticeable on the ground) and run diagonally rather than parallel to the proposed temporary track, there is therefore opportunity for dewatering of bog between ditches due to changes in hydrology. Tracks will be floating so no excavation of peat or complete blocking/ diversion of hydrological flow paths is anticipated.

Normally in such circumstances a 30m indirect loss buffer would be appropriate in line with Scottish guidance and underlying evidence. However, as in this case the infrastructure will be temporary (c. 2 years), there will be less time for dewatering impacts to spread beyond the infrastructure and result in material changes to bog condition and vegetation composition. Additional degradation due to plant movements either side of the proposed infrastructure footprint are expected within 5m.

We have therefore used a **5m** indirect loss buffer assuming degradation of condition from good to moderate in Stage 1 and improvement from moderate to good in Stage 2 (see Section 3.3.1.4 for a description of Stages).

As bogs tend to be slow growing/ recovering habitats due both to vegetation species and underlying hydrology, recovery in Stage 2 is anticipated to take **10 years**.

3.3.1.7 Area 2

This area is bounded on all sides by existing roads or tracks. It has mixed soils and a mosaic of habitats as a result presumably of the adjacent road construction. Habitats include scrub, grassland and heath. A watercourse drains through the centre of the area.

Degradation of habitats due to plant movements either side of the proposed infrastructure footprint are expected within **5m**.

We have therefore used a **5m** indirect loss buffer assuming degradation of condition from moderate to poor in Stage 1 and improvement from poor to moderate in Stage 2 (see Section 3.3.1.4 for a description of Stages).

These habitats tend to recover from damage relatively quickly and recovery in Stage 2 is anticipated to take **5 years or under** (standard multipliers used).

3.3.1.8 Area 3

Due to limited restoration potential of the area (see Section 0), for the purpose of the calculations in this document, we have assumed permanent loss of the infrastructure footprint and a 5m buffer.

3.3.1.9 Summary of Terminology Assumptions

- Peatland = minimum peat depth of:
    - where the substrate is granular >45cm deep or >30cm deep where bog is drained, or
    - no minimum depth where peat it is over bedrock.
- Priority peatland = a peatland supporting Priority Annex 1 bog habitat.
- Priority Annex 1 bog = bog habitat "*supporting a significant area of vegetation that is normally peat forming*"[28].

- Indirect loss = temporary loss and recreation of the same habitat, with wetland/ bog habitats permanently degraded to a poorer condition post-restoration due to drainage features.
- Indirect loss buffer on peatlands with drainage ditches at 5m spacing = 5 m.
- Indirect loss buffer on other peatlands with ditches of other spacing = ditch spacing up to a max of 30m (e.g. for peripheral drains).
- Restoration buffers, 5m /or ditch spacing up to 30m, and for wetland habitats where restoration is not possible to within 30m of infrastructure due to drainage impacts.

3.3.1.10 Summary of Blanket Bog Habitat Loss Calculations (Main Wind Farm Development Site & HEA only)

Habitat loss calculations for all habitats are provided in Table 3-2 above. Excluding polygons where bog formed a minority element of mosaics, the total estimated loss of blanket bog is summarised in Table 3-4, 32.78 ha in total of which only 24.36 ha is direct, permanent loss.

Table 3-4: Summary of habitat loss estimate for the Main Wind Farm Development Site & HEA (Fossit habitat classification system)

Habitat	Total Area (ha)	Direct loss (ha)	Indirect & temporary loss (ha)	Total loss (ha)
PB3 (moderate condition)	22.55	0	0	0
BL3	1.25	0.21	0.23	0.43
GS4	16.7	0.17	0.10	0.27
PB4 (moderate condition)	119.11	13.06	6.5	17.66
PB4 (poor condition)	114.43	11.3	3.28	15.12
WD4	169.93	9.79	24.54 (forest to bog)	34.33
WS1	8.7	0.31	0.09	0.4

3.4 Step 1c: Calculation of the area of Peatland Restoration Required for Biodiversity Compensation and Enhancement inc. which areas of the Main Wind Farm Development Site & HEA should be prioritised for this.

This section draws on the bog restoration feasibility study Step 3.

3.4.1 Habitats to be Restored

The type of habitats to be restored will reflect those to be lost during the Proposed Development's construction and will aim to replace habitats lost with similar or higher value habitats. On this basis the HMP (**Appendix A**), is therefore largely focussed on peatland and bog habitats.

3.4.2 Bog Restoration Area Required for Biodiversity Compensation

Following ditch blocking and an associated change in the vegetation within the zone of influence around each ditch blocked (taken to be 5 m to 30m see Section 3.3.1.3), we expect bog habitat to reach good condition.

In keyholed forestry felling areas around turbines we expect forest to bog restoration to be successful but that bog will only reach poor/ moderate condition due to drainage influences from infrastructure and remaining forestry as well as potential issues with forest self-set and regeneration, poor condition has been assumed on a precautionary basis. In most of these keyhole locations ground smoothing will be undertaken making restoration to PB3 practical and success more likely than in the area around proposed turbine 10, where there is no agreement for bog restoration and therefore drained, drier conditions are likely to persist (PB4), and recovery may take significantly longer (we have assumed the default 30+ years, as per multipliers in the BNG metric)

3.4.2.1 The following sections explain the rationale behind the bog enhancement strategy. Approach to Calculation of Required Restoration Area (ha): Metric Selection

There is no standard compensation to restoration ratio for peatland loss set out in Irish guidance, this may be resolved to some extent in future by the recently released ITT metric if it is up-dated to reflect large area projects as well as linear infrastructure.. We have therefore drawn on guidance for similar contexts that is available for Scotland, England, and the SSER biodiversity tool kit (SEE metric) which is becoming increasingly widely accepted in Scotland and is more flexible and design more specifically for large-scale renewables projects than the English statutory metric (statutory metric).

Before choosing a metric as an approach to calculating habitat loss compensation ratios for the Proposed Development it is important to understand the likely difficulty and time to target condition in this context. Multipliers for these are used in both the statutory and SSE metrics. For both metrics the multipliers are the same for the same difficulty to time categories, however the SSE metric permits manual selection of which category is most suitable whereas this is fixed in the statutory metric.

3.4.2.2 Literature on Bog Restoration Timescales and Success

3.4.2.3 Time to Target Condition

Mounting evidence from Scottish sites indicates that the transition from moderate to good condition blanket bog via drain blocking is likely to be in the region of 5 - 15 years (Statutory metric multipliers = 0.837 to 0.586). For example, at Forsinard Flows Reserve Sphagnum cover increased from around 5% to around 20% in 14 years (1997 to 2011 (RSPB 2012)) following tree felling and ditch blocking. A broader study based on five sites in the Peak District National Park echoes this and indicates that the majority of bog condition indicators have reached levels expected of restored bog in 5-10 years[50] (Figure 3).

This study states that "*at timescales of around a decade these systems achieve a new steady state for most ecosystem functions.*"

We have therefore used a time to target condition multiplier that reflects a 10 year restoration timescale (multiplier = 0.700).

[50] Alderson, D.M., et.al. 2019. Trajectories of ecosystem change in restored blanket peatlands. Science of the Total Environment 665 (785-796).

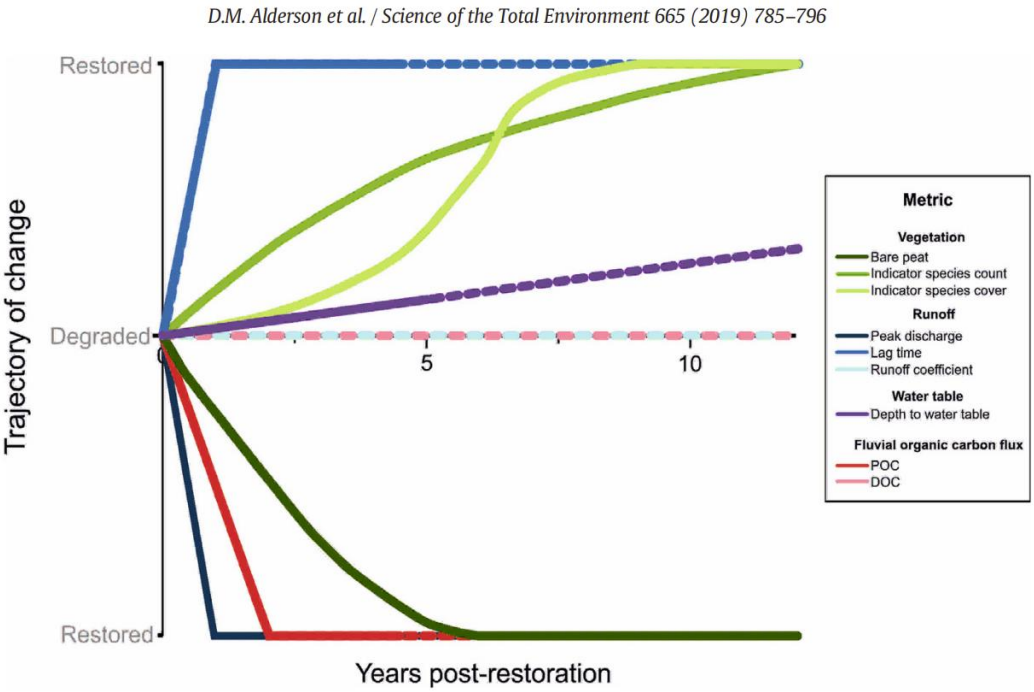

Figure 3: Bog restoration time scales. *Taken from Alderson et. al. 2019: Conceptual model of trajectory of change of key metrics representing ecosystem services in response to restoration. The extremes of the y axis represent a restored ecosystem.*

3.4.2.4 Difficulty of Restoration

The difficulty of habitat enhancement multiplier represents the risk of enhancement work failing to achieve the desired outcome based on a range of variables that influence restoration success including for example hydrological regimes, soil nutrients, and sources of biological material, and on-going management needs etc. We take the 0.33 high difficulty multiplier included in the Statutory Metric to infer that the two thirds of the restoration area is expected to fail to attain the desired condition within the relevant time to target condition.

The difficulty of peatland restoration varies greatly depending on the situation and restoration methods required, from more challenging areas being for example large expanses of bare peat at high altitude, on sloping ground; to more straightforward projects such as those involving ditch blocking at lower to moderate altitude on flat to gently sloping ground. The Statutory Metric does not distinguish between these.

The literature however suggests that bog-restoration via ditch blocking has a relatively high success rate where implemented following best-practice guidance (RSPB 2012). In addition, evidence complied by Artz et. al. 2018[51], indicates that rewetting (reflecting drain and gully block activities) across 15 sites extended to slightly beyond the area treated in the first year, with success stabilising at around 60% in the longer term (Figure 4).

[51] Artz, R. R.E., et. al. 2018. Peatland restoration – a comparative analysis of the costs and merits of different restoration methods. Climate x change: Scotland centre of expertise connecting climate change and policy. https://www.climatexchange.org.uk/wp-content/uploads/2023/09/peatland-restoration-methods-a-comparative-analysis.pdf

A multiplier for moderate difficulty of 0.67 is therefore more realistic in this instance, where ditch blocking is proposed on flat to gently sloping land, than the 0.33 multiplier would be.

We have therefore used a difficulty multiplier that reflects moderate difficulty (multiplier = 0.67).

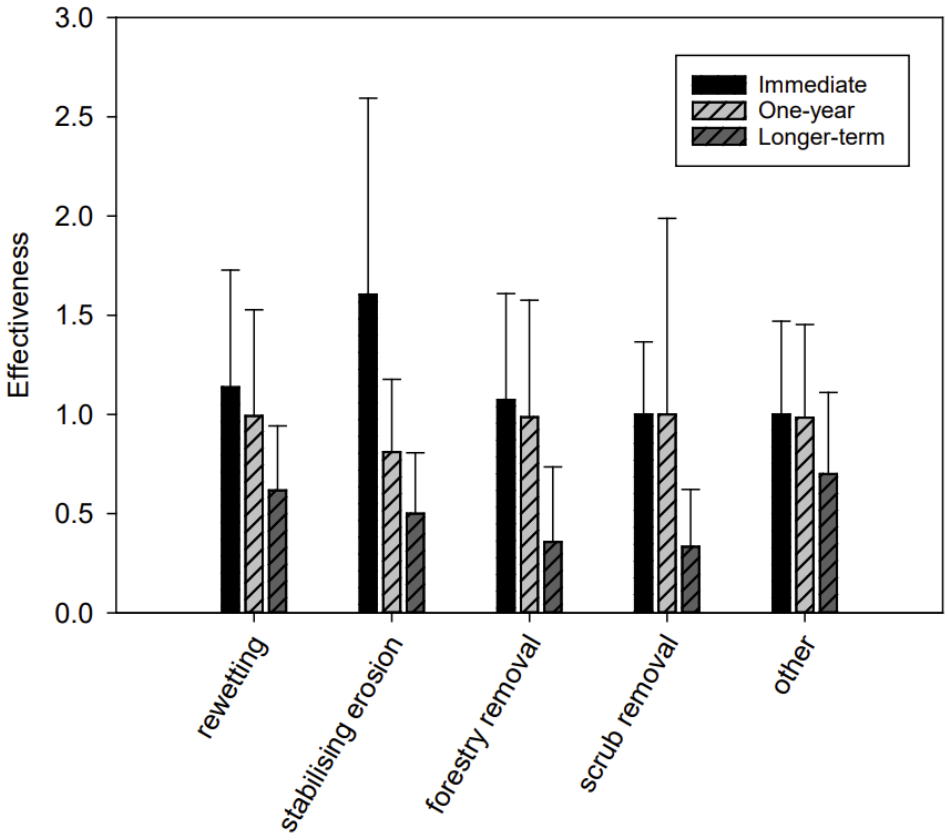

Figure 4: Bog restoration success. *Taken from Artz et. al. 2018: Perceived effectiveness of the restoration intervention types, based on 19 completed responses.* Effectiveness for rewetting = proportion of the intended area rewetted.

3.4.2.5 Bog Condition Enhancement & Forest to Bog Assumptions

Where cutover bog PB4 is to be rewetted by ditch blocking including replacing lost peat by infilling ditches with excavated peat, this has been entered into the metric as enhancement from PB4 to PB3 (lowland blanket bog). This in addition to condition enhancement from baseline to good condition. In both cases adjusting the area considered to exclude the 30m buffer of infrastructure which may not fully rewet.

Where forest will be felled but will not be replaced with infrastructure, in most locations ground smoothing will be undertaken. Here the end habitat is anticipated to be PB3. However, in the land-holding around T10 where ground smoothing will not be undertaken, the end habitat is anticipated to be PB4 as ditches and areas where peat has been removed will be left untreated. In this area recovery to bog habitat even in poor condition is expected to be slow and we have implemented the automatic time to target condition of 30+ years (as per default BNG metric time to target condition multipliers).

3.4.2.6 Metric and Policy Compensation and Calculations Comparison

3.4.2.7 Scottish Guidance

Scottish guidance[19] requires a blanket **1: 10.0** ratio of bog habitat loss to restoration, plus a 10% gain.

3.4.2.8 English Guidance

The application of Statutory BNG metric is mandatory for development projects such as wind farms in England. It is designed to calculate the value of habitats and to assess BNG for developments. Habitat value is based on its area * distinctiveness * condition and measured in biodiversity units (BU). The metric then uses two main multipliers to assess the area of habitat restoration required to compensate for any BU lost during construction. These multipliers relate to:

- The length of time a habitat is expected to take to reach the habitat type and condition desired relative to baseline (time to target condition); and
- How difficult it is to achieve successful restoration, e.g. risk of complete or partial restoration failure (difficulty of creation/enhancement).

The statutory metric assumes that c., 2/3rds of the bog restoration effort will fail (multiplier of 0.33) and that the time to target condition is in excess of 30 years for enhancement from poor or moderate to good condition (multiplier of 0.32) or 20 years for enhancement from poor to good condition (multiplier of 0.49).

Natural blanket bog is considered to be very-high distinctiveness (score = 8) and be an irreplaceable habitat for which bespoke compensation is required and BNG calculations cannot be undertaken if loss of these is involved. Degraded/ cut-over bog is considered high distinctiveness (6).

Statutory Metric Calculation = ((post-management: distinctiveness * condition * area) - (baseline: distinctiveness * condition * area)) * (difficulty of restoration e.g. 0.33 * time to target condition e.g. 0.32).

Using these multipliers and assuming that the area of bog lost is in the same condition as restoration area baseline, a restoration ratio of **1: 4.7** (enhancement from poor to good condition (time multiplier = 0.32)), **1: 6.2** (enhancement from poor to moderate condition (time multiplier = 0.49)) to **1: 18.9** (enhanced moderate to good condition (time multiplier = 0.32)), is required to reach a roughly net neutral position. Note this this only achieves net zero and in reality, a 10% gain is required based on the precautionary principle.

3.4.2.9 SSER Biodiversity Tool Kit (SSE metric)

The SSE metric is essentially a version of the statutory metric that has been modified by SSE to better reflect up-land areas and the renewables sector, this makes sense as the statutory metric was largely designed around the built environment sector in lowland England. Realistically, habitat distinctiveness, and creation and enhancement difficulty and timelines can be quite different between these different settings. Both metrics use the same multipliers e.g. 30+ year to target condition = 0.32.

Like the statutory metric, the SSE metric also differentiates between natural blanket bog (distinctiveness 8) and cut-over bog distinctiveness (6).

The SSE metric reflects this context dependence of habitats by permitting for adjustments for the difficulty of restoration and time to target condition multipliers, based on scientific evidence and professional judgement, these are fixed in the Statutory metric.

In addition, the SSE metric permits calculations involving blanket bog loss so long as it does not meet SSE's definition of irreplaceable habitat, which effectively requires the bog to be in priority Annex 1 condition (for more detail see Section 0).

Like the statutory metric the SSE metric requires bespoke compensation for loss of irreplaceable habitats.

3.4.2.10 Transport Infrastructure Ireland Biodiversity Metric Tool for Road, Greenway and Light Rail Projects: User Guide Document

This tool was released in December 2025[52], it is Ireland specific however its focus is on linear infrastructure projects. For this reason and as at the time of its release BNG calculations for the Proposed Development were largely complete, we have not used in in the assessment of the Proposed Development. We do however make reference to it where appropriate.

3.4.2.11 Summary

The use of a metric has merit in providing consistency and a well-recognised (in the GB and Ireland) standard approach to determining compensation requirements. Based on the above, it is considered that the Statutory metric calculation approach would not provide an accurate reflection of likely restoration conditions at the Proposed Development in particular as it will not permit calculations involving bog habits. Therefore, a more flexible metric like the SSE Metric is more appropriate in this case both for undertaking this calculation and in reflecting the project setting in its design.

Our approach to selecting the SSE metric rather than the statutory metric reflects the theme of proportionality in EIA as per CIEEM guidance[53], as well as good scientific practice in examining the appropriateness of model (metric) parameters for individual use cases.

At the Proposed Development the literature indicates that combining a '10 years to target' condition multiplier (0.7), with a moderate difficulty of habitat enhancement (0.67) multiplier.

Using these multipliers and assuming that the area of bog lost is in the same distinctiveness and condition as the restoration area baseline and is enhanced to better condition rather than an more distinctive bog habitat, a restoration ratio of **1:1.1** (enhancement from poor to good condition), **1:2.1** (enhancement from poor to moderate condition) to **1:4.26** (enhanced moderate to good condition), is required to reach a roughly net neutral position. Note this only achieves net zero and in reality 10% gain is required based on the precautionary principle. As the majority of bog at the Proposed Development is in moderate condition a c.10% gain would require a ratio of around **1:8**.

In this instance however, the potential to block and infill ditches additionally permits that it is realistic to assume PB4 bog (high distinctiveness) will be enhanced to PB3 bog (very high distinctiveness. Assuming enhancement from moderate condition PB4 to Good condition PB3 over 10 years a 10% gain will be achieved with a restoration ration of **1:3**.

As bog habitat loss is anticipated to be in the region of 30ha, this will require up to 99 ha to reach a 10% gain.

This assumes that restoration is from moderate to good condition. However as in some areas, restoration from poor to good condition is likely possible and here the area required will likely be slightly lower. See section 3.7.1 for BNG calculations and results.

[52] https://cdn.tii.ie/publications/GE-ENV-01112-01.pdf

[53] "The evaluation of significant effects should always be based on the best available scientific evidence proportionate to the severity of those effects"

Post-enhancement monitoring will be carried out to confirm the effectiveness of the bog restoration measures.

3.5 Step 2: Determine Carbon Balance: Accounting for Sequestration by Restored Bog and Re-use of Excavated Peat

3.5.1 Overview

The IUCN's Emission & Carbon Cost Calculator was completed with the required information from the SSE Biodiversity Tool Kit spreadsheet created for the Proposed Development, the Peatland Code and the Peatland Code Field Protocol. The SSE Biodiversity tool kit provided the area for each assessment unit of peatland that is to be restored. The Peatland Code and the Peatland Code Field Protocol provided the necessary carbon emission factors for pre-restoration and post-restoration condition categories, as well as the information to validate the correct pre-restoration and post-restoration categories.

Using this information, the emission reduction for each area unit was calculated. These were then cumulated into a final high claimable emission output for the project, assuming a total project length of 35 years. A low claimable emission output for the Proposed Development was also calculated, accounting for a risk buffer contribution of 5% and final carbon costs of circa 10,000 tCO2e for the Proposed Development.

3.5.1.1 Carbon sequestration via bog restoration

It is assumed that all areas will be rewetted and that the Proposed Project lifetime will be 35 years. 200 hectares of the Main Wind Farm Development Site and HEA will be rewetted via the following, details are provided in the HMP:

- Ditches blocking and in-filling within open habitats c. 162 ha (to reach good condition in 10 years).
- Ground smoothing in key-holed and other areas of forest felling c. 20.25ha (to reach poor condition in 10 years).
- Forest to bog in key-holed and other areas of forest felling near T10 c. 4.29ha (to re-ach poor condition in 10 years).
- Reprofiling of cutting faces in areas of peat extraction c. 14ha (to reach good condi-tion in 10 years).
- High level estimate:
- Gross emission estimate: 988.6 tCO_2e per year
- 35 years of sequestration = 34,603 tCO_2e
- **Low level estimate** (5% risk buffer per year and 10,000 tCO_2e carbon costs):
- Net emission estimate: 939.2 tCO_2e per year
- 35 years of sequestration – 10,000 tCO_2e carbon costs = 22,872 tCO_2e

3.5.2 Avoided Emissions via Excavated Peat Re-Use

3.5.2.1 Capacity for peat re-use on site

Within the peatland restoration area, there is a total drainage ditch length of 98 km (Figure 6). Survey data indicate ditches are typically 1 m in depth and 1.5 m wide resulting. Excluding lengths that are within 30 m of watercourses from those that are suitable for back filling leaves c. 80 km.

3.5.2.2 Peat excavation volumes and excesses

By keeping the excavation of peat on the Main Wind Farm Development Site as low as practical (125,180m^3), it has been practical to find ways to re-use all excavated peat on site (see **Technical Appendix 6.3**), with 107,080m^3 that may otherwise have been disposed of offsite potentially leading to oxidation and carbon emissions, being used for in-filling ditches.

Reuse of excavated peat in bog restoration therefore will mitigate the extent of CO_2e emissions released due to the project via peat excavation by approximately c. 119.9 tCO_2e for the project overall. This figure assumes a depth of 1m, does not take into account the emissions associated with excavation and transport and is based on a middle value of higher and lower estimates calculated in line with the methodology presented under Section 3.5.1.1.

3.6 Step 3: Determine the total area of bog that it is feasible to restore (re-wet) within the open ground on the Main Wind Farm Development Site & HEA, taking into account constraints such as infrastructure and ecological sensitivities.

3.6.1 Hydrology & Hydrogeology Setting and Screening

The Main Wind Farm Development Site is drained by three watercourse catchments:

- Doolough Stream to the northwest, which ultimately discharges to Blacksod Bay;
- Tristia to the east, which ultimately discharges to Tullaghan Bay; and
- An Ráith to the south, which ultimately discharges to Blacksod Bay.

Both the Tristia and An Ráith watercourses were classified by the Environment Protection Agency (EPA) as Good in the most recent (2019-2024 cycle) classification, whilst the Doolough Stream was classified as Poor, due to invertebrate status / potential with reported pressures from agriculture and peat extraction.

The hydrology of the Main Wind Farm Development Site has been altered significantly by an extensive network of drainage ditches across the entirety of the Main Wind Farm Development Site as illustrated in Photograph 1 and Photograph 2.

The HEA has historically been used for peat extraction and whilst vegetation has returned to the flat surfaces, the vertical cut faces are bare peat as illustrated in Photograph 3

Photograph 1: Aerial Photograph Illustrating Extent of Drainage Network Across Site

Photograph 2: Typical Ditch

Photograph 3: Peat Excavation Face

Historically ditches were installed by the landowner with the intention to lower groundwater levels in the peat soils to drain to watercourses in order to improve productivity of the soils for agriculture. These ditches provide the Proposed Project with an opportunity for ditch blocking and peatland re-wetting. Surface runoff from precipitation is routed via the network of drainage ditches to watercourses and infiltration to the soils to maintain high groundwater levels is hindered. This routing of runoff to watercourses, which would otherwise have infiltrated to the peat, results in a more flashy flow regime in watercourses where river levels rise and fall faster in response to precipitation events.

The degraded peatland habitats observed across the Main Wind Farm Development Site and HEA are a result of this lowering of groundwater levels and intervention presents opportunities to prevent further drying out of soils and to raise the groundwater levels within the peat, improving habitats and regulating flow to the water environment to offer improvements in water quality and flow through use of peatland habitat restoration methods.

Geological Survey Ireland (GSI) describe the bedrock that underlies the Main Wind Farm Development Site and HEA as foliated orthogneisses (**EIAR Figure 6-3**) derived from a sequence of trondhjemitic, granodioritic and granitic igneous precursors with localised migmatisation and potassium metasomatism. All are deformed to a variable degree, and metamorphosed and intruded by several ages.

The GSI record the foliated orthogneiss bedrock unit as a poor aquifer (**EIAR Figure 7-4**) which is generally unproductive except for local zones. The GSI report blanket peat lying directly on top of the bedrock. The low permeable nature of the bedrock beneath the Main Wind Farm Development Site and HEA is ideal for maintaining high groundwater levels and is not a constraint for peatland restoration.

The Environment Protection Agency (EPA) classify the ground waterbody at the Main Wind Farm Development Site (ground waterbody ID: Belmullet, **EIAR Figure 7-6**) as Good within their 2019-2024 cycle.

3.6.1.1 Screening Results

From review of the geology, hydrogeology, peat and drainage data for the Main Wind Farm Development Site the ditch network suitable for blocking is extensive (Figure 6), and the only constraints on site are:

- Larger slopes greater than 6°, which, where present, are generally associated with the banks of watercourses (Figure 5);
- Areas less than 1 m of peat depth (Figure 7);
- It is intended only keyhole felling is competed in the areas of forestry, the areas of forestry are not considered an ideal candidate for potential restoration whilst commercial forestry remains in place.
- Proposed infrastructure where a 30 m bog restoration effectiveness buffer has been assumed (Figure 8);
- Watercourses where a 30m buffer is not currently assumed to be necessary but may be required if during implementation, mitigation designed to protect the watercourse from bog-rewetting activities is not considered sufficient, based on live evidence at the time (Figure 8).

It is noted that some small, isolated areas of slopes greater than 6° exist on site as a result of the manmade features on site, however because of their isolated nature surrounded by flat topography they are not considered a constraint.

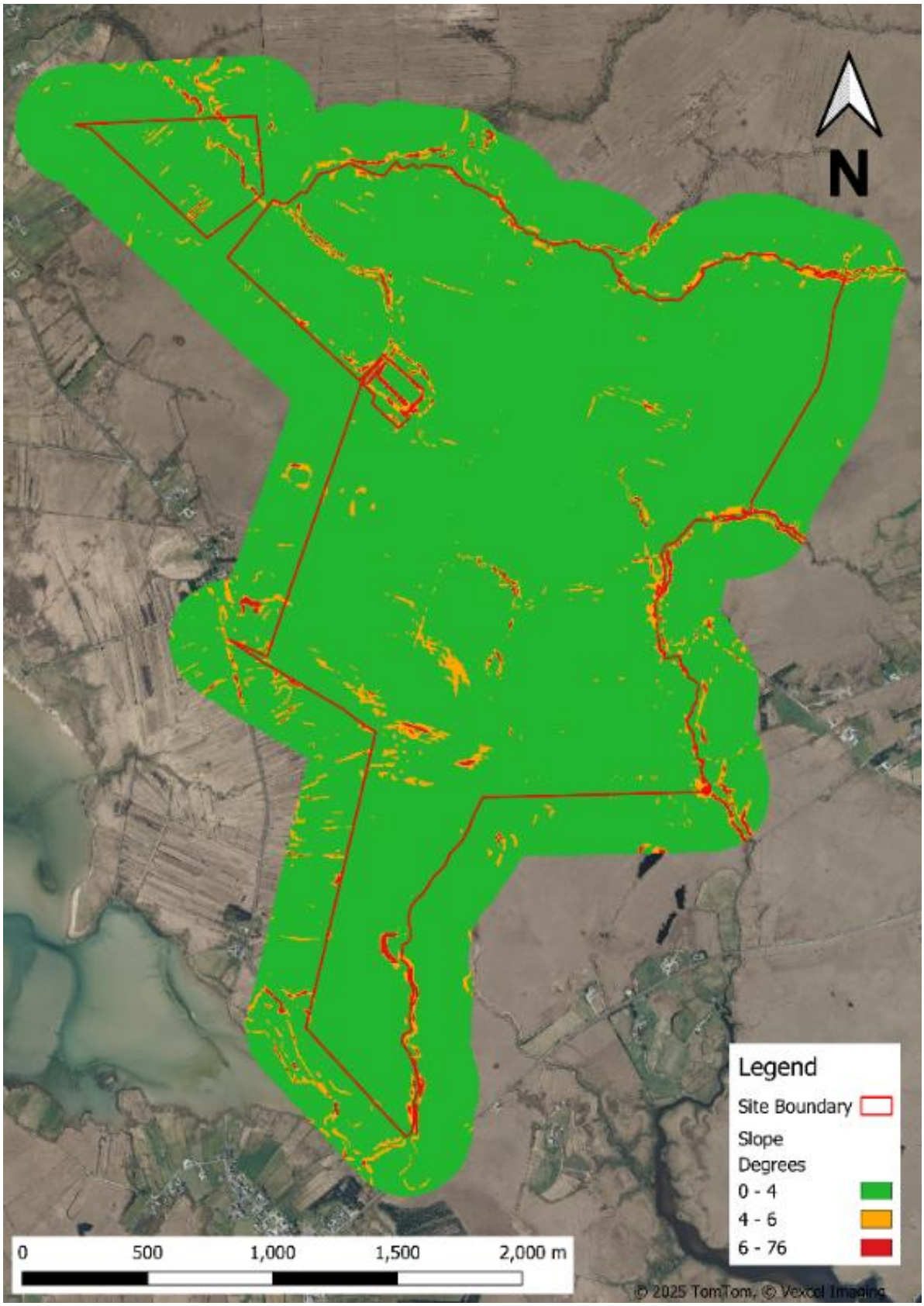

Figure 5: Slope (Site = Main Wind Farm Development Site & HEA)

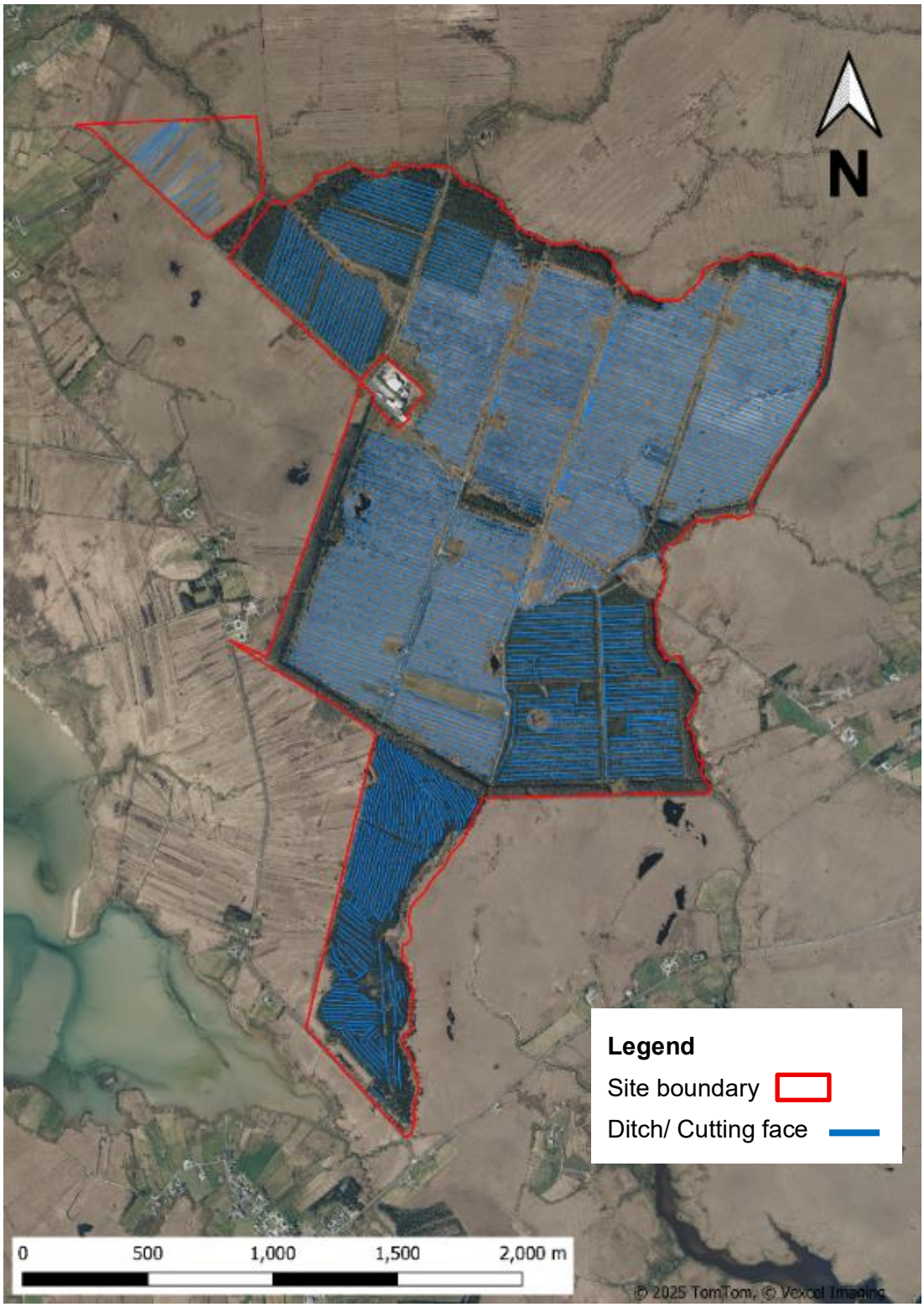

Figure 6: Ditches and Cutting faces (Site = Main Wind Farm Development Site & HEA)

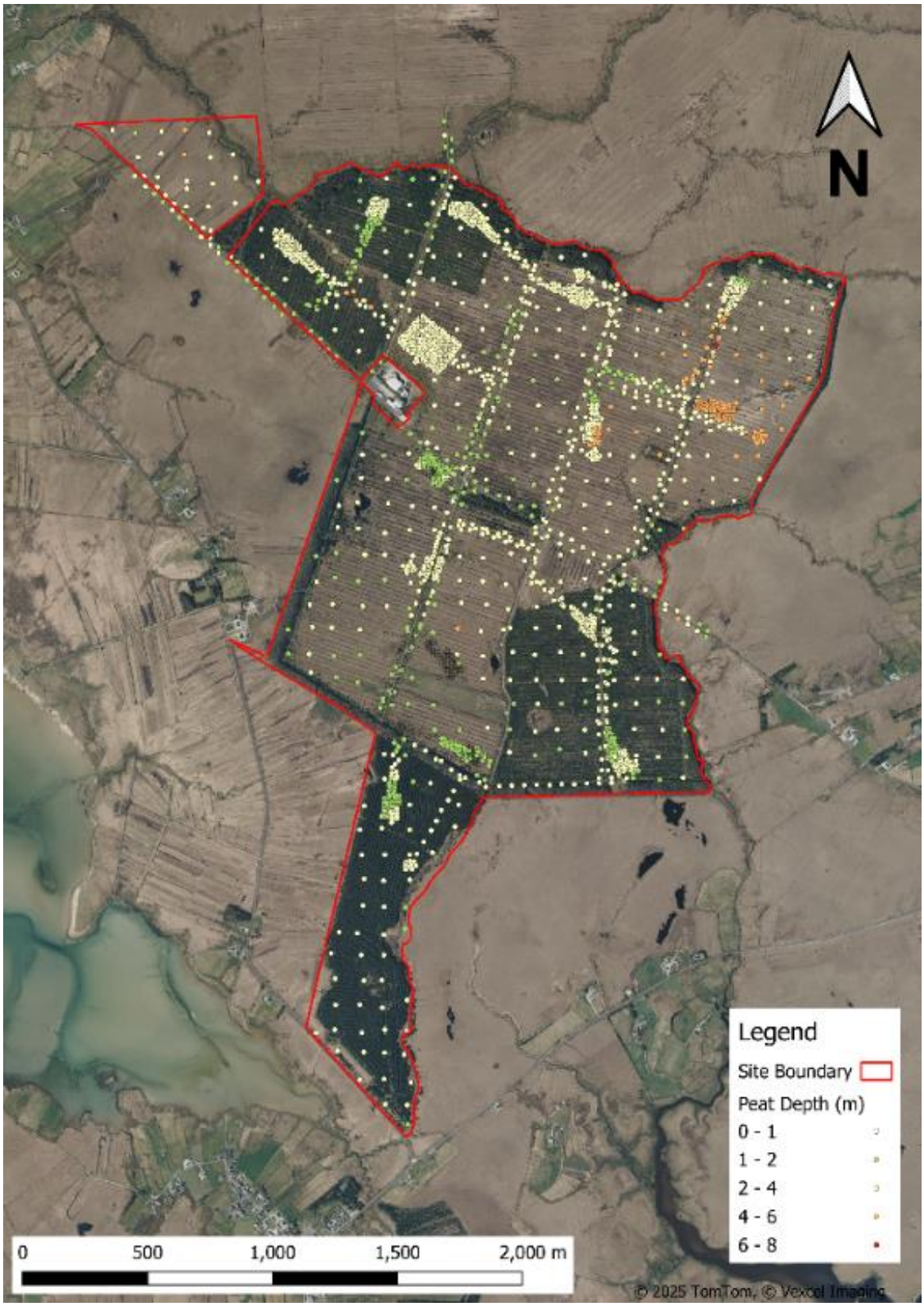

Figure 7: Peat Depth Data (Site = Main Wind Farm Development Site & HEA)

Potential Candidate Areas for the restoration of peatlands within the Main Wind Farm Development Site and HEA are illustrated in Figure 8.

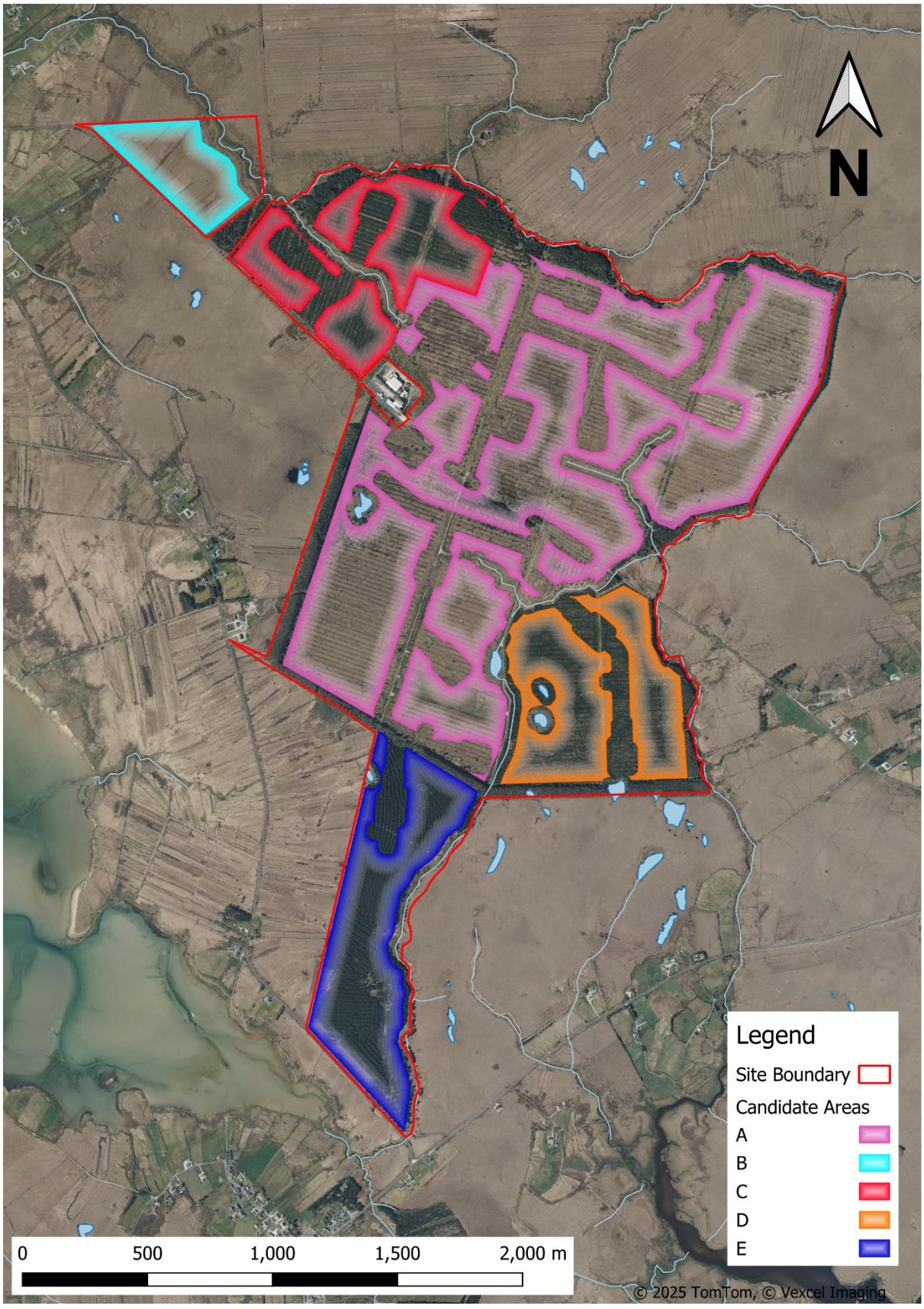

Figure 8: Potential Restoration Candidate Areas (Site = Main Wind Farm Development Site & HEA.)

This Figure shows a 30m buffer of infrastructure where re-wetting is less likely to be effective and a 30m restoration buffer of watercourses where infilling will not be undertaken but it has been assumed for purposes of this document that ditch blocking will be undertaken.

3.6.2 Infrastructure Constraints

Based on Nature Scot bog restoration guidance[19] to determine the distance for new and existing infrastructure where bog restoration may not be fully effective a 30m buffer was considered appropriate to reflect the distance into the bog over which the infrastructure associated drainage may limit re-wetting effectiveness.

No bog restoration will be undertaken in the land-holding around T10, in accordance with landowner agreements.

3.6.3 Ornithological Considerations

Peatland restoration at the Main Wind Farm Development Site will involve blocking the ditches with the aim of returning the water table to within 10cm of the peat surface enabling the growth of peat forming/ carbon sequestering species. This will enhance the condition of the bog habitats on the Main Wind Farm Development Site and make them more favourable for associated species of fauna including bird species that favour bog habitats such as waders where vegetation is shorter; and Hen Harrier, Merlin and their prey species such as meadow pipit where taller dwarf-shrubs and Molinia dominate.

However, based on the findings of the ornithological surveys carried out at the Main Wind Farm Development Site, it is unlikely that significant numbers of high collision risk bird species would be attracted into the Main Wind Farm Development Site (**See Chapter 5: Biodiversity** of the EIAR for more details).

In addition, the operational turbines will act as a continuous source of disturbance. As such, any displacement effects on birds are likely to persist once the habitat enhancements have taken effect.

Therefore, the improvements to habitat quality will not attract birds back to the area in a way that would significantly increase collision risk (See **Technical Appendix 5-8 Avian Collision Risk Model** report in Volume 3 of the EIAR for more details).

Overall, the ecological and ornithological benefits of rewetting peat include providing additional habitat for open-ground bog species and will outweigh any slight increase in collision risk that improved habitat condition near to turbines may entail which is not likely to be significant in the context of the EIA Regulations.

3.6.4 Potential Restoration Methods

3.6.4.1 Scrub Clearance

Scrub vegetation is present and widespread throughout the Main Wind Farm Development Site. As scrub contributes to drying of peatland, removing it can aid re-wetting and promote growth of Sphagnum mosses. Sphagnum mosses are a critical part of any peatland restoration effort due to their ability to absorb and retain moisture, acidify the surrounding environment and thus, slow plant decay and allow greater carbon storage in the soil. Scrub clearance will therefore be undertaken and included as one element of the HMP.

At the Main Wind Farm Development Site, this will be most effectively achieved by using a brush cutter and chainsaw with vegetation being cut up into smaller, more manageable pieces before being mulched. Sections too large to be cut by a chainsaw will be left on the

bog surface to promote biodeterioration, biofragmentation and ultimately assimilation into the underlying peat.

Scrub clearance is not confined by the buffers associated with proposed infrastructure as it is will not substantially impact the water environment, however it remains subject to ecological constraints including nesting birds, reptiles, etc.

3.6.4.2 Ground/Surface Smoothing

Again, owing to the widespread legacy ditch network that has lowered groundwater levels at the Main Wind Farm Development Site from the ridge/furrow pattern across much of the site, ground/surface smoothing would aid the regeneration of the peatland environment by encouraging water table rebound and vegetation recovery, particularly in areas of keyhole felling. Ground smoothing will be carried out in these keyhole areas.

By manipulating the topography and creating a more uniform surface, it allows the natural hydrological function of the area to be restored and encourage growth of advantageous peat-forming vegetation like Sphagnum mosses. The primary means of ground/surface smoothing are inverting any tree stumps within the candidate areas, ditch blocking, compacting the land with machinery, covering the surface with mulch, and infilling drains.

Ground/surface smoothing is not confined by the buffers associated with proposed infrastructure or the water environment unless combined with ditch blocking, however remain subject to ecological constraints including ground nesting birds, reptiles, etc.

3.6.4.3 Ditch Blocking

This method involves creating a blockage (or dam) within a ditch, preventing the drainage channel acting as a conduit for water flow and draining the peat soils, thus raising the water table. As part of the earthworks associated with the Proposed Development, peat will be excavated during construction of hardstanding and other elements of infrastructure.

There are three approaches for ditch blocking that will be implement on the Main Wind Farm Development Site, generally constrained by the width of the drainage channel:

- Dams (wooden and/or peat) with infilling from excess peat on all ditches;
- Zipping / zippering on ditches <1.5 m wide; and
- Dams (wooden and/or peat) on all ditches.

The management of the peat during excavation and storage will be delivered by the Peat Management Plan (PMP) (**Technical Appendix 6.3** of the EIAR). The excavated peat provides a great opportunity for the improvement of hydrogeology and peatland habitats at the Main Wind Farm Development Site.

At the Main Wind Farm Development Site it is intended that suitable ditches (those not within the buffer of natural watercourses) are entirely backfilled with excavated peat from earthworks within the development area. Due to the length of ditches to be infilled, dams will be placed at routine 10-20m intervals to maximise stability and water retention of the peat within the legacy ditch. Alternating wooden and peat dams will be used at the Main Wind Farm Development Site owing to their greater longevity in the acidic peat environment and very low slopes observed on the Main Wind Farm Development Site whilst providing a resource efficient solution. Peat dams are generally unsuitable where the depth of solid peat at the base of the drain is ≤50cm.

Ditches will have surface vegetation removed from the sides and base of the ditch prior to the emplacement of excavated peat and any vegetation will be placed on any bare peat. Dams will be keyed (extended), into the deep peat at either side of the ditch to provide the

best watertight seal that can be achieved whist ensuring stability. When using peat to form the dam, this will be done up to a maximum ditch width of 1.5m and depth of 1.2m.Dried out or unconsolidated peat will never be used, only highly humified, fully waterlogged peat should be used. As the peat is inserted into the drain, it will be compacted and upon completion the dams top will be extend approximately 30cm above the surface of the bog and covered with a living layer of peatland vegetation.

Ditches will be infilled up to a 30m buffer from proposed watercourses. The end point of the infilling will be secured with a dam to maximise stability.

Should it be impractical to infill the ditches within the Candidate Areas, zipping / zippering and ditch blocking using wooden dams or peat recovered from a small borrow pit near to the planned ditch dam will be used as to raise groundwater levels.

Zipping is a form of re-profiling that is typically used in conjunction with wave damming. Dams are formed every 8 m with the remaining drain line between each dam “zipped”. Unlike other forms of re-profiling, this technique completely in-fills the drain void and therefore natural surface flow path ways are instantly restored. Zipping will be prioritised on ditches <1.5 m wide to reserve peat infilling on ditches wider than 1.5 m in the unlikely event that there is insufficient peat to infill all ditches within the Candidate Area.

Dams without the associated backfilling with peat will follow the same construction methodology and criteria as those ditches for peat infilling however these will retain water behind the dams, with excess water encouraged to spread out over the surface of the peatland. Vegetation within the ditches will be left in place while these dams are put in place and water levels rise.

In terms of re-wetting potential current BNG calculations assume a 30 m buffer from infrastructure for condition enhancement due to its drainage influences, and no buffer from watercourses (assuming ditch blocking but not infilling within the 30m watercourse buffer).

3.6.4.4 Hag Reprofiling

The HEA has historically been used for the removal of peat, with bare faces of peat exposed at the edges of where peat was cut away remaining (Photograph 3). The angle the peat face here is too great for vegetation to establish and reprofiling is needed to achieve an appropriate angle to encourage vegetation to return whilst minimising erosion. Here the layer of live vegetation including its roots will be removed (but retained for later use) back far enough to allow the reprofiled face to maintain an angle of around 30 degrees (typically around 2 m).

The peat face will be reprofiled to 30 degrees and compacted to ensure there are no air pockets or cavities where water could escape. The reserved vegetation will then be stretched out across the reprofiled face. If there is insufficient vegetation to provide a cover of the reprofiled face, then vegetation will be recovered from areas of excavation in the main site or by creating a small borrow pit near the reprofiled area and transferring vegetation from the borrow pit to the reprofiled face, stretching the adjacent vegetation over the borrow pit area to ensure it also has been protected. The layer of vegetation will then be compacted into the peat to ensure a good contact of roots with the underlying peat.

A restoration buffer of 30m should be applied to both sides of the re-profiled hag to estimate the area that will benefit from the restoration work, this equates to 14.7ha.(**Figure 6**).

Note that the cutting faces were mapped remotely (c. 4.61km in total), and should be mapped in the field during post-consent production of the next iteration of the habitat management plan to further refine the estimate of the restorable area.

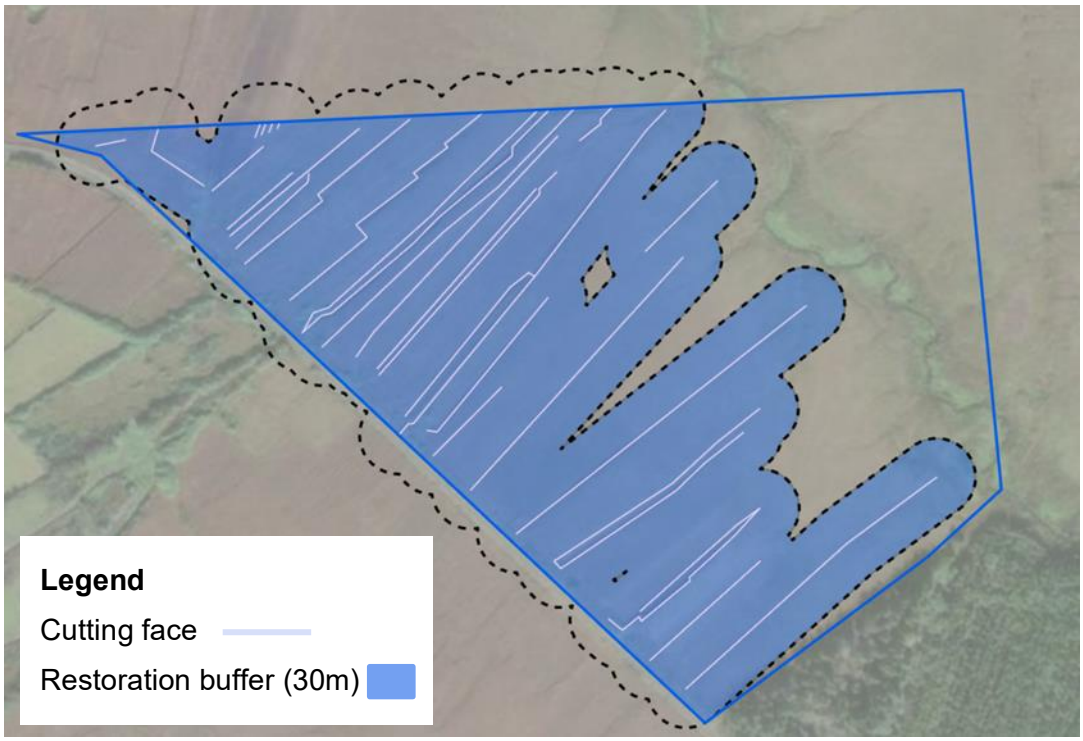

Figure 9: Estimated restorable area via cutting face re-profiling

3.6.5 General feasibility

Regarding topography and peat depths, there are very few constraints on the Main Wind Farm Development Site or HEA for peatland habitat restoration including the re-use of excavated peat from the development. The area within the Main Wind Farm Development Site & HEA is generally flat with very limited areas where slopes are greater than recommended for peatland habitat restoration (slopes greater than 6 degrees), all of which are bound to the larger ditches on site and would not be considered suitable for peatland habitat restoration due to their proximity of natural watercourses regardless. Peat depths across the Main Wind Farm Development Site & HEA and have been surveyed over a series of peat probing exercises, which have confirmed peat depths across the site are almost entirely in excess of 1m and therefore not a constraint for peatland habitat restoration methods including ditch blocking, which is the preferred restoration approach here.

3.6.6 Area available for restoration

All open areas within the Main Wind Farm Development Site & HEA and the key holed areas within forestry are suitable for bog restoration, via:

- Scrub clearance across the entire Main Wind Farm Development Site;
- Ground smoothing within key-holed areas in forestry, except around T10 (Candidate Areas C, D and E);
- Ditch blocking and infilling in open areas within the Main Wind Farm Development Site (Candidate Areas A and B); and
- Cutting-face re-profiling within the HEA , where peat cutting has historically taken place (Candidate Area B).

Details on re-wetting buffers and associated restoration area calculations are provided above.

In line with NatureScot guidance, re-wetting may not be fully effective within 30m of new and existing infrastructure due to their associated drainage features and that meaningful enhancement of bog condition in these areas may not be practical. Therefore, these areas have been excluded from calculations of the restorable area (they are treated as retained, minus any direct loss to infrastructure).

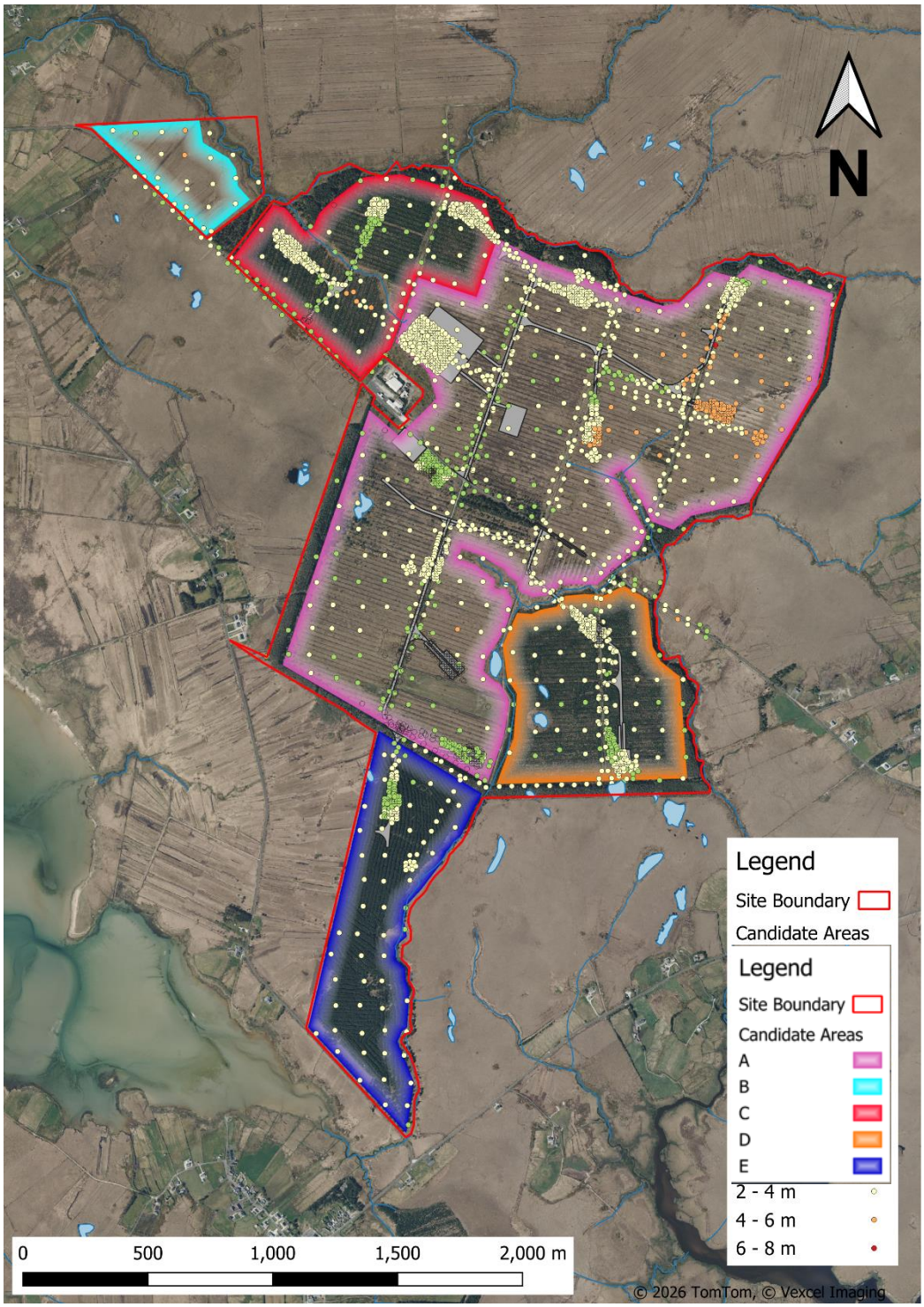

Figure 10: Restoration Feasibility Candidate Areas, and Peat Probe Locations (dots)

3.7 Step 4: Define the area of bog to be restored and provide an associated Habitat Management Plan.

See Section 3.1, which discuss and define the area of bog to be restored. The associated habitat management plan can be found in Appendix A.

3.7.1 SSE Metric – BNG Calculation Methods for Muingmore

3.7.1.1 Approach to Irreplaceable Habitats (active / priority annex 1 bog)

SSE guidance[54] states that: "*Where designated sites, legally protected species or irreplaceable habitats are being negatively affected, project wide claims should not be made, even if these impacts are compensated for. In these situations, projects should aim to achieve net gains in other non-irreplaceable habitats*."

Irreplaceable habitats are noted by SSE to "*include all areas of active blanket bog or raised bog*". Based on the EUNIS definition[55] this would be equivalent to priority Annex 1 bog where "*active*" is taken to mean "*still supporting a significant area of vegetation that is normally peat forming*".

The SSE guidance additionally states that: "*Irreplaceable peatland in Scotland has been considered by SSE as all areas of blanket bog or raised bog where the condition score cannot be increased e.g. good condition, which is assumed to mean 'active' blanket bog/raised bog*." Although this is Scotland specific there is no ecological reason why the same approach should not be applicable in Ireland.

In addition, the TII Irish metric[46] currently only considers bog which is mapped under Article 17 to be irreplaceable habitat.

"*Irreplaceable habitat layers and protected site boundaries are sourced from the National Parks and Wildlife Service (NPWS) data webpage[1] to inform the Options Appraisal process. Irreplaceable habitat layers are sourced from Article 17 spatial data for 2019. These layers comprise Raised bog, blanket bogs, machair, turloughs, limestone pavement and ancient long established woodland*;"

3.7.1.2 Main Site

Within the Main Wind Farm Development Site & HEA, the SSE definition of irreplaceable habitat applies only to larger areas of PB3 Lowland blanket bog not the majority of the site which is drained (PB4).

Note that the polygons of PB3 do exist within the Main Wind Farm Development Site but are small and therefore do not meet the definition of priority annex 1 bog.

The priority Annex 1 bog area associated with the Proposed Development is therefore considered to be restricted to the HEA, where bog restoration work and no infrastructure is planned. This area is also mapped under Article 17 and therefore included in the Favourable Reference Area for blanket bog in Ireland[56].

On this basis the Proposed Development will not have any negative impacts on irreplaceable habitats. Only positive impacts are planned in separate the northwest area (HEA).

3.7.1.3 Over-run Areas

Area 1: This is an area of PB3 blanket bog, however it is not considered to be active due to low cover of Sphagnum moss and is not mapped as Article 17 habitat. It is therefore **not** considered to constitute **irreplaceable habitat**.

Area 2: Is not a bog area and **does not** contain any habitats that are considered to be **irreplaceable habitats**.

[54] https://www.sserenewables.com/media/iz2jbehn/sser-bng-toolkit-user-guide_v2-2.pdf

[55] https://cdr.eionet.europa.eu/help/natura2000/Documents/Int_Manual_EU28.pdf

[56] https://www.npws.ie/sites/default/files/publications/pdf/article-17-report-2025-volume-2.pdf

Area 3: This area currently de-vegetated peatland. It is largely within an area mapped as Article 17 habitat and is therefore in BNG calculations **treated as irreplaceable habitat**.

We have undertaken BNG habitat loss calculations for Area 3 to inform a discussion of what degree of bespoke compensation may be appropriate to compensate for losses in this area.

3.7.1.4 SSER Metric Calculations

All habits anticipated to experience indirect loss were entered to the SSE Metric, as lost and re-created as the same habitat type (Creation).

Within areas of indirect loss, target condition assumptions for bog and wetland habitats as follows, other habitats are assumed to retain their baseline condition:

- If a wetland habitat in an area of indirect loss is in moderate condition at baseline, based on professional judgement we have assumed it will be in poor condition post construction.
- If a wetland habitat in an area of indirect loss is in poor condition at baseline, based on professional judgement we have assumed that while construction may further reduce condition, the habitat will not transition to another habitat type and will therefore be retained in poor condition as there is no lower condition category.

The areas to be included in the metric as areas for bog-restoration/ condition enhancement are discussed in Section 0.

We used the standard time to target condition and difficulty of restoration multipliers for all habitats other than bog where the justification above was used to select 10 years to target condition and moderate difficulty.

- Areas within 30m of infrastructure were excluded from bog enhancement areas.
- Within the approximately 24ha of felling buffer around turbines/ tracks, bog restoration to poor condition is realistic.

3.7.1.5 SSE Metric Results & Summary

Overall we anticipate a 32% gain for non-irreplaceable habitats and an 8% gain for irreplaceable habitats.

Table 3-9 provides a summary of the data for the Main Wind Farm Development Site & HEA entered into the SSE metric using the Fossit Habitat classification system, and its outputs. Similar data for the over-run areas is presented in Table 3-7, Table 3-8 & Table 3-9.

For some habitats, there are multiple rows for that habitat at baseline depending on the expected post-management outcome for that area e.g. loss and creation of a new habitat, or habitat enhancement.

3.7.1.6 Non-Irreplaceable Habitats

Overall, the project will result in a **+ 32%** net gain of **non-irreplaceable habitats**:

- Baseline (development site 2889.9 BU) + (over run areas 130.84) = 3,020.74 BU
- Combined development site and over-run area gain = (987.18 - 16.88) = 970.30 BU
- Combined gain = 32%

3.7.1.7 Irreplaceable Habitats

- Restoration of the HEA adjacent to the Main Wind Farm Development Site is estimated to deliver a gains of 60BU of irreplaceable habitat (lowland blanket bog).

- Proposed work in Over-run Area 3, taking into account the assumptions for this area set out earlier in this document, will result in a loss of 23 BU of irreplaceable habitat.
- Overall, this results in a **gain of 37BU of irreplaceable habitat** (8% gain).

Table 3-5: BNG Summary Main Wind Farm Development Site & HEA (over-run areas not included)

Habitat Type	Baseline Units	Post Development Units	Net Change	% Change in Units
Non-IRR	2889.9	3877.77	+ 987.18	+34%
IRR[57]	396.7	457.37	+ 60.74	+15%

Table 3-6: Over-run BNG summary - Baseline to Post - construction

Habitat Type	Area	Baseline Units	Post Development Units	Net Change	% Change in Units
Non-IRR	1	126.32	103.87	-22.45	-18%
	2	4.16	3.99	-0.17	-4%
	3	0	0	0	0
	Total	**130.48**	**107.86**	**-22.62**	**-17%**
IRR[58]	3	23.23	0	-23.23	-100%

Table 3-7: Over-run BNG summary - Post - construction to Post-reinstatement

Habitat Type	Area	Post Development Units	Post Reinstatement Units	Net Change	% Change in Units
Non-IRR	1	107.11	112.98	5.87	5%
	2	4.16	4.03	-0.13	-3%
	Total	**111.27**	**117.01**	**5.74**	**5%**

Table 3-8: Over-run Areas BNG summary – Total (Combined outcome Table 3-7 & Table 3-8)

Habitat Type	Net Change
Non-IRR	-16.88
IRR[59]	-23.23

The trading rules[60] are included alongside unit change calculations that projects must comply with in order to make BNG claims. In this case, for high distinctiveness habitats the trading rules are met (compensation is like for like or like for better condition). For medium and low distinctiveness these habitats represent an area that would historically have been bog.

[57] Irreplaceable habitats

[58] Irreplaceable habitats

[59] Irreplaceable habitats

[60] Trading rules govern what sort of habitats can be used to compensate for the loss of other habitats. For example, it is not permitted to compensate for loss of small areas of very high distinctiveness habits with larger areas of low distinctiveness habits (this would be an example of trading down).

Therefore, enhancement via trading up to a better distinctiveness habitat via bog restoration is entirely appropriate.

In summary therefore, the approach taken to bog habitat restoration set out in this report (enhancement or creation) with over c. **200 ha**, in compensation for direct and indirect loss of c. **30ha** of bog and additional enhancements. This is equivalent to an overall c. **1:6 compensation ratio.** Note that this compensation/ restoration area also accounts for the loss of 36 ha of other habitats, which are mostly 34 ha of commercial forestry, of which 24.54ha will be lost to bog restoration.

3.7.1.8 Limitations

These calculations were undertaken as far as practical using the site layout and habitat data. Therefore, the following measures will be implemented:

Pre-construction:

- Spot checks will be undertaken to determine any changes in habits since baseline surveys;
- The area where peat cutting face re-profiling in the HEA will have a confirmatory field survey undertaken to confirm the restorable area;
- The baseline situation is up-dated;
- The results will be integrated into the next iteration of the HMP plan.

Post-construction:

- The areas of habitat loss and restoration are captured accurately to take account of design flexibility.
- The BNG calculation is up-dated and integrated into the live version of the HMP.

Table 3-9: Habitat Loss, Enhancement and Creation - SSER Metric Summary for the Development Site and Adjacent Area (Over run areas excluded)

Baseline											Post-construction									Net change in units	
Habitat	Area (ha)	Condition	Connectivity	Strategic significance	IRR Habitat	Distinctiveness	IRR Units	Other habitats Units	Area Retained	Area Removed	Action	Habitat	Area (ha) created or enhanced	Condition	Connectivity	Strategic significance	Distinctiveness	Action difficulty	Time to target condition (years)	IRR Units	Other habitats Units
BL3 Buildings and artificial surfaces	1.25	N/A - Other	Low	Low	No	Very Low	-	0.0	0.8	0.4	Creation	BL3 Buildings and artificial surfaces	20.58	N/A - Other	Low	Low	Very Low	Low	0.0	-	0.0
FL2 Acid oligotrophic lakes	0.3	Moderate	Moderate	Low	No	High	-	4.0	0.3	0.0	NA	FL2 Acid oligotrophic lakes								-	0.0
FL8 Other artificial lakes and ponds	0.06	Moderate	Low	Low	No	Low	-	0.2	0.1	0.0	NA	FL8 Other artificial lakes and ponds								-	0.0
FS1 Reed and large sedge swamps	0.36	Moderate	Low	Low	No	High	-	4.3	0.4	0.0	NA	FS1 Reed and large sedge swamps								-	0.0
GS3 Dry-humid acid grassland	0.17	Moderate	Moderate	Low	No	Very High	-	3.0	0.2	0.0	NA	GS3 Dry-humid acid grassland								-	0.0
GS4 Wet grassland	16.6	Moderate	Low	Low	No	Medium	-	132.8	16.4	0.2	NA	GS4 Wet grassland								-	-1.4
GS4 Wet grassland	0.1	Moderate	Low	Low	No	Medium	-	0.8	0.0	0.1	Creation	GS4 Wet grassland	0.1	Moderate	Low	Low	Medium	Low	7.0	-	-0.8
HD1 Dense bracken	1.21	N/A - Other	Low	Low	No	Low	-	0.0	1.2	0.0	NA	HD1 Dense bracken								-	0.0
PB3 Lowland blanket bog	0.01	Moderate	Moderate	Low	No	Very High	-	0.2	0.0	0.0	NA	PB3 Lowland blanket bog								-	0.0
PB4 Cutover bog	3.82	Poor	Moderate	Low	No	High	-	25.2	0.0	3.8	Creation	PB4 Cutover bog	3.82	Poor	Moderate	Low	High	Medium	12.0	-	-14.2
PB4 Cutover bog	3.2	Moderate	Moderate	Low	No	High	-	42.2	0.0	3.2	Creation	PB4 Cutover bog	3.2	Poor	Moderate	Low	High	Medium	12.0	-	-33.0
PF2 Poor fen and flush	0.42	Moderate	Moderate	Low	No	Very High	-	7.4	0.4	0.0	NA	PF2 Poor fen and flush								-	0.0
WD4 Conifer plantation	135.6	Poor	Low	Low	No	Low	-	271.2	135.6	0.0	NA	WD4 Conifer plantation								-	0.0
PB3 Lowland blanket bog	22.54	Moderate	Moderate	Low	Yes	Very High	396.7	-	22.5	0.0	Enhancement	PB3 Lowland blanket bog	14.7	Good	Moderate	Low	Very High	Medium	10.0	60.7	-
PB4 Cutover bog	80.64	Poor	Moderate	Low	No	High	-	532.2	80.6	0.0	Enhancement	PB3 Lowland blanket bog	80.64	Good	Moderate	Low	Very High	Medium	10.0	-	748.8
PB4 Cutover bog	82.15	Moderate	Moderate	Low	No	High	-	1084.4	82.2	0.0	Enhancement	PB3 Lowland blanket bog	82.15	Good	Moderate	Low	Very High	Medium	10.0	-	508.6
WS1 Scrub	8.67	Moderate	Low	Low	No	Medium	-	69.4	8.7	0.0	NA	WS1 Scrub							5.0	-	0.0
WD4 Conifer plantation	1.64	Poor	Low	Low	No	Low	-	3.3	0.0	1.6	Creation	BL3 Buildings and artificial surfaces	1.64	N/A - Other	Low	Low	Very Low	Low	0.0	-	-3.3
WD4 Conifer plantation	4.29	Poor	Low	Low	No	Low	-	8.6	0.0	4.3	Creation	PB4 Cutover bog	4.29	Poor	Moderate	Low	High	Medium	30+	-	-2.5
WD4 Conifer plantation	6.48	Poor	Low	Low	No	Low	-	13.0	0.0	6.5	Creation	BL3 Buildings and artificial surfaces	6.48	N/A - Other	Low	Low	Very Low	Low	0.0	-	-13.0
WD4 Conifer plantation	20.25	Poor	Low	Low	No	Low	-	40.5	0.0	20.3	Creation	PB3 Lowland blanket bog	20.25	Poor	Moderate	Low	Very High	Medium	12.0	-	37.3
PB4 Cutover bog	1.83	Poor	Moderate	Low	No	High	-	12.1	0.0	1.8	Creation	FL8 Other artificial lakes and ponds	1.83	Poor	Low	Low	Low	Low	1.0	-	-8.5
WS1 Scrub	0.03	Moderate	Low	Low	No	Medium	-	0.2	0.0	0.0	Creation	WS1 Scrub	0.03	Moderate	Low	Low	Medium	Low	7.0	-	-0.1
PB4 Cutover bog	2.58	Moderate	Moderate	Low	No	High	-	34.1	0.0	2.6	Creation	FL8 Other artificial lakes and ponds	2.58	Poor	Low	Low	Low	Low	1.0	-	-29.1
WD4 Conifer plantation	1.67	Poor	Low	Low	No	Low	-	3.3	0.0	1.7	Creation	FL8 Other artificial lakes and ponds	1.67	Poor	Low	Low	Low	Low	1.0	-	-0.1
PB4 Cutover bog	28.15	Poor	Moderate	Low	No	High	-	185.8	18.7	9.5	NA	PB4 Cutover bog								-	-62.7
PB4 Cutover bog	31.2	Moderate	Moderate	Low	No	High	-	411.8	20.7	10.5	NA	PB4 Cutover bog								-	-138.3

Appendix A Habitat Management Plan

RWE Renewables Ireland Limited

SLR Project No.: 501.065301.00001

27 February 2026

Habitat Management Plan

RWE

Prepared by: Ida Bailey

SLR Consulting Limited

No. 50 Stirling Business Centre, Wellgreen, Stirling,
FK8 2DZ

SLR Project No.: 501.065301.00001

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Revision	Date	Prepared By	Checked By	Authorised By
01	4 March 2026	Ida Bailey	Richard Arnold	Richard Arnold
02	19 April 2026	Ida Bailey	Richard Arnold/ Gareth Hughes	Richard Arnold/ Gareth Hughes
	Click to enter a date.			
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Executive Summary

The Habitat Management Plan (HMP) has the following goals, and provides implementation and monitoring plans for the protection and restoration of nature and biodiversity at the Proposed Development in line with the mitigation measures set out in Chapter 5 of the EIAR and the Peatland Restoration Plan (PRP):

1. Minimise, as far as practicable, the removal of peat and bog vegetation from site during construction.
2. Compared to baseline, enhance the condition of peatlands outside afforested areas via restoration for the benefit of associated biodiversity, carbon storage and sequestration, and water management.
3. Eradicate, as far as practicable, invasive alien plant species from the Main Wind Farm Development Site.
4. Maintain populations of breeding birds and bats, relative to natural variation.
5. Restore the over-run areas 1 and 2 to baseline or better habitat condition following the removal of temporary infrastructure.

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Appendix A Figures 01

Acronyms and Abbreviations

HMP	Habitat Management Plan
HMG	Habitat Management Group
PRP	Peatland Restoration Plan

1.0 Introduction

The purpose of this report is to define the goals, objectives, management and monitoring that will achieve the commitments to nature and biodiversity mitigation, compensation and enhancement as set out the Biodiversity Chapter and associated Peatland Restoration Plan (PRP).

1.1 The Proposed Development

The Proposed Development is located in the coastal region of Mayo and will occupy two areas of peatlands and partially forested lands bisected by a local road L-5252 (Figure 01).

The Proposed Development, if consented, comprises of 13 wind turbines, and associated infrastructure.

A single 110kV Grid Connection Route (GCR) is assessed as part of this EIAR but is not the subject of this planning application. This will be the subject of a later application which will require works along public roadways to facilitate a 110kV underground Grid Connection to Bellacorick Substation. This in addition to the Proposed Development is described as the Proposed Project. A full detailed description of the Proposed Project is in **Chapter 2** of this EIAR, with a list of defined terms in **Chapter 1** of this EIAR.

1.2 Document Scope and Purpose

This document provides an overview of the planned habitat management and biodiversity monitoring. It will serve as a live document which will be updated following planning consent as the project moves towards implantation and post-construction monitoring. Any subsequent iterations will consider planning conditions, confirmatory and monitoring survey results that will become available over those timeframes.

This HMP sets out the habitat restoration work that will achieve the level of compensation and enhancement that the project has committed to in the Peatland Restoration Plan, as well as other mitigation and monitoring committed to in Chapter 5 of the EIAR – Biodiversity.

Key terminology includes avoidance, mitigation, compensation and enhancement, these are defined as set out in CIEEM's Key Principals of EcIA[1]:

- Mitigation Negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.
- Compensation[2] Where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
- Enhancement Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

This plan covers:

- The Proposed Development Site including:.
    - The Main Wind Farm Development Site: part of the Proposed Development Site which includes the proposed wind turbines and associated infrastructure.

[1] https://cieem.net/wp-content/uploads/2018/08/EcIA-Guidelines-v1.3-Sept-2024.pdf

[2] In this context compensation does not relate to compensation as defined in article 6.4 of the Habitats Directive.

- Over-run areas one and two along the turbine delivery route (TDR) to the Proposed Development Site, and
- The Habitat Enhancement Area in the NWQ (HEA), a small separate triangular area to the northwest of the Main Wind Farm Development Site, which will not include any infrastructure related to the Proposed Project other than that to enhance habitat.

1.3 The Carbon Implications of Bog Habitats on Site

Muingmore Wind Farm is a proposed 13 turbine site in Ireland. Based on recent habitat surveys (see Chapter 5), the dominant habitat on site is degraded blanket bog, with priority blanket bog also present but largely limited to the HEA, wet grassland, and conifer plantation on peat >50cm deep (Figure 01).

The wider area appears to be a mix of blanket bog and degraded (drained) blanket bog which provides largely uninterrupted habitat connectivity to the Wild Nephin National Park, the interruptions are roads and watercourses.

Peat is a carbon store and blankets the majority of the Main Wind Farm Development Site and HEA at >50cm depth. Even a thin peat layer of 30cm has a carbon store equivalent to tropical rainforest ha/ha [3], and the 2006 IPPC guidance for National Greenhouse Gas Inventories considers organic soils (including peatlands) with a depth of >10cm. As the majority of the Main Wind Farm Development Site and HEA is peatland, it therefore contains significant stores of carbon.

As it stands, available national statistics suggest that near natural bog should remove 3.54tCO2e per hectare from the atmosphere per year. However, as the bog on the Main Wind Farm Development Site is mostly drained (Figure 02.) it could be a carbon source. Drained peat and peat planted with commercial forestry are often carbon sources as they dry the peat compared to its natural saturated state permitting oxidation of the stored carbon. Areas of priority Annex 1 bog, particularly those parts in good condition in the HEA, where no peat extraction has been undertaken may however be carbon sinks.

The construction of the Proposed Development will require some drainage and displacement of peat and peatland including blanket bog.

Therefore, in terms of land use change (not taking into account the carbon benefit of displacing fossil fuel electrical generation with wind), the Proposed Development would likely generate an increase in net greenhouse gas emissions, if it damages bog further, or a potentially a net sink, if bog condition is improved enough for peat forming to begin again as is planned via the PRP.

1.4 The Biodiversity Implications of Bog Habitats on Site

Bog habitats are the habitats on site which are identified as having the highest ecological importance in terms of distinctiveness and extent. In terms of area, the next most dominate habitat is non-native commercial conifer forestry which has low biodiversity value (Figure 01). The bog habitats align with the Annex I criteria for Blanket bogs. In terms of conservation value these areas of bog can be split into broadly three categories:

[3] ICUN Peatland Programme. 2020. Position statement: Peatland and trees: https://www.iucn-uk-peatlandprogramme.org/sites/default/files/header-images/Resources/IUCN%20UK%20PP%20Peatlands%20and%20trees%20position%20statement%202020.pdf

- The majority of the area is PB4 (cutover blanket bog). This area is degraded due to the extensive drainage network in this area, the percentage of sphagnum moss cover is less than 40% within these areas. The low sphagnum cover means that these areas are identified as being in poor-moderate condition and do not meet the criteria for the Priority type of this Annex I habitat; “still supporting a significant area of vegetation that is normally peat forming”.
- There are a few ‘polygons’ of Lowland Blanket Bog (PB3 in the Fossitt classification system) within the Main Wind Farm Development Site. However, these are not shown on the Irish landcover database (Article 17). In addition these areas are small and are therefore not considered extensive enough to meet the definition of priority Annex I Blanket bogs.
- A more extensive area of PB3 exists in the HEA where we have confirmation of peat forming species from field survey. This area is the Priority type of this Annex I habitat. This area is also identified as Priority Annex 1 habitat in the Irish landcover database (Article 17). Peat cutting face reprofiling is planned in this area as part of restoration work.

1.5 Background

In order to compensate for direct and indirect loss of biodiversity and carbon rich soils (peat) as a result of the construction of new infrastructure, the remaining habitats on site will be restored (e.g. drain blocking in bog habitats) or new habitats will be created (e.g. forest conservation bog habitats) to add biodiversity and carbon storage/ sequestration value. This Habitat Management Plan sets out how this will be achieved.

The approach taken to quantification of biodiversity and carbon for loss and gain calculations is set out in the Peatland Restoration Plan.

2.0 Evidence of Technical Competence

The HMP has been written by Ida Bailey, with peatland restoration technical expertise provided by Adrian Cowe, and review by Andrew Torsney. Additional support has been provided by SLR's wider biodiversity, hydrogeology and GIS teams. Bios for key team members are provided below:

Ida Bailey, PhD., ACIEEM, CERPIT

Ida leads SLR's Nature and Natural Capital team in Europe. She has a PhD., and B.Sc. in biodiversity and natural sciences related fields. She is an Associate member of CIEEM, a certified ecological restoration practitioner in training (CERPIT) with the Society for Ecological Restoration and sits on the panel of academic specialist for the Biodiversity Futures Initiative. She has over 17 years of ecological consultancy and research experience both in the UK and overseas and specialises in innovative, multidisciplinary ecological restoration, nature positive, bio-credit and natural capital projects.

The project was led by Ida Bailey, with support from SLR's wider biodiversity, hydrogeology, carbon and GIS teams. Bios for key team members are provided below:

Andrew Torsney PhD, MRes, BSc. (Habitats and Ecology)

Andrew is a Technical Director in SLR's Ecology and Biodiversity technical discipline and manages the Irish Ecology team. Andrew has over 12 years' experience within the ecology and environmental sector. He has managed and undertaken ecological assessments at a range of scales including detailed Annex I habitat surveys. Andrew has also conducted research on the implications of habitat classification regarding conservation outcomes of Annex I habitats. Andrew is a technical botanical specialist with extensive planning experience regarding ecological assessments at all scales from local to national.

Adrian Cowe, MSc (Hydro-geology)

Adrian is an associate hydrologist. His key areas of experience and interest are in the areas of hydrological, hydrogeological and geological assessment for EIA and FRA, and quantitative water quality assessments. He holds expert knowledge and experience of surface and ground water sampling methodology, water quality monitoring instrumentation and data analysis. He has worked for a wide range of clients across a number of sectors including power, mining, water utilities and transport.

Chris Marshall, PhD., MSc (Peatland restoration)

Chris is a Principal Consultant specialising in peatland risk management, monitoring and restoration design. Chris has extensive experience in the characterization of peatland condition and developing monitoring solutions from the site to the national scale. Chris has spent more than a decade working in academia and industry on a variety of research projects in areas such as hydrocarbon exploration, sedimentology, engineering geology, climate reconstruction, remote sensing and peatland science working collaboratively with Govt, NGO's and private sector clients to deliver peer reviewed publications, reports including as a member of scientific advisory committees.

Luke Moseley, Msc. (Carbon)

Luke is an experienced sustainability and carbon management professional with a strong track record in corporate and project-level climate strategy. He has led the management and analysis of sustainability data, authored climate chapters for Environmental Impact Assessments (EIAs), conducted GHG emissions inventories across Scope 1, 2 and 3, and

developed a deep working knowledge of relevant policies, frameworks, and regulatory requirements for carbon reduction. With a specialism in land-based emissions, his MSc research focused on the opportunities and challenges of measuring and reporting emissions from land use and land use change.

Joe O'Reilly, MSc. (GIS)

Joe is a Senior GIS Analyst with over 6 years of experience in the development and implementation of spatial solutions. His experience includes desk-based assessments of ecosystem services and biodiversity; feasibility studies and opportunity mapping for renewable energy sources requiring the development of a bespoke assessment methodology based on best practice and the aims of the project; the synthesis and analysis of a wide array of social, economic and environmental datasets; and the visualisation of project outputs in dynamic decision-making tools.

3.0 Key Stakeholders and Consultees

This HMP is a live document that will be agreed, reviewed and up-dated by key stakeholders working together as a Habitat Management Group (HMG). The group will be led by the wind farm developer/ owner and their ecologist, and the following additional stakeholders as a minimum will be invited to participate:

- The local planning authority; and
- The landowner.

4.0 Targets, Goals and Objectives

4.1 Terminology

The following definitions are taken from the International Standards for Habitat Restoration[4]:

- The **Scope** is the broad geographic or thematic focus of a project.
- The **Vision** is a general summary of the desired condition one is trying to achieve through the work of the project. A good vision is relatively general, visionary (inspiring), and brief.
- The **Targets** identify the native ecosystems to be restored at a site as informed by the reference model, along with any social outcomes or constraints expected of the project.
- **Goals** are formal statements of the medium to long-term desired ecological or social condition, including the level of recovery sought. Goals must be clearly linked to targets, measurable, time-limited, and specific.
- **Objectives** are formal statements of the interim outcomes along the trajectory of recovery. Objectives must be clearly linked to targets and goals, and be measurable, time-limited, and specific.
- **Indicators** are specific, quantifiable measures of attributes that directly connect longer-term goals and shorter-term objectives. Ecological indicators are variables that are measured to assess changes in the physical (e.g., turbidity units), chemical (e.g., nutrient concentration), or biotic (e.g., species abundance) ecosystem attributes as guided by the reference model. Social-ecological or cultural indicators measure changes in human wellbeing such as participation in traditional practices, governance, language and education.

4.2 Scope

The spatial scope of the HMP is all areas within the Main Wind Farm Development Site, the HEA, and over-run areas 1 and 2 (Figure 02), collectively the Habitat Management Area (HMA).

The HMP will be valid for the duration of the wind farm's operation, unless stated otherwise for specific goals or objectives, or unless subsequently agreed via the HMG.

4.3 Vision

To compensate for the loss of blanket-bog and other biodiversity on site due to the construction of the wind farm through restoring the area, volume and condition of remaining peat and peatlands on site for the benefit of biodiversity, carbon storage and sequestration and other associated ecosystem services such as water storage, regulation and filtration; and appropriate management and monitoring of other habitats and biodiversity.

[4] Society For Ecological Restoration. 2019. "International Principles and Standards for the Practice of Ecological Restoration."

4.4 Targets

4.4.1 Target Features

The targets of the HMP have been chosen based on the assessment in the Biodiversity Chapter of the Environmental Impact Assessment Report. They reflect those habitats or species for which impacts are expected to be greatest, and those habitats or species where restoration or conservation efforts offer the greatest, practical opportunity to restore and enhance the biodiversity of the Proposed Development. They are set out in **Table 4-1**.

Table 4-1: HMP Target Features

Target Feature	Rationale
Bog habitats: PB4 Cutover bog and PB3 Lowland blanket bog and peatland habitats typically associated with blanket bog PF3 Transition mire and quaking bog, PF2 Poor fen and flush	• The predominant semi-natural habitat on site is PB4 (cutover bog) in poor to moderate condition due to drainage. • This is a non-priority Annex I habitat. • Without any compensation, mitigation and enhancement measures, there will be a loss of c. 33ha of this habitat due to construction of the wind farm - this would have a significant impact (see Chapter 5)
Other natural/ semi-natural habitats	• Loss of small areas of hedgerows, treelines, grassy verges, wet grassland, and scrub (inc. mosaics) without any compensation, mitigation and enhancement measures would be expected to have a significant impact (see Chapter 5).
Invasive alien plant species	• Without mitigation, the construction of the wind farm has the potential to accelerate the spread of invasive alien plant species such as *Rhododendron ponticum*, e.g. by improving growing conditions via additional drainage and by accidental spreading of seeds and vegetive material e.g. in plant tracks.
Kestrel	• Without mitigation, significant impacts on kestrel are possible due to collision with turbines as Kestrel may move into the newly felled keyholed areas around turbines to forage.
Other birds at risk of collision	• No significant collision mortality for any species is anticipated, • Monitoring for bird collisions will be carried out at the wind farm to verify the effectiveness to account for any changes to species populations, distribution or flight/ migration patterns.
Breeding bird assemblages of open and semi- open/ forest edge habitats	• Habitat loss leading to indirect disturbance / displacement, especially of breeding Eurasian woodcock, yellowhammer, skylark, willow warbler and meadow pipit, could, in the absence of mitigation/ compensation result in significant impacts on populations.
Snipe	• Without mitigation, enhancement or compensation measures, loss of one pair of snipe is anticipated due to habitat loss.
Bats	• Significant collision mortality for some species of bat is anticipated without mitigation.

4.4.2 Goals

The HMP has the following goals:

1. Minimise, as far as practicable, the removal of peat and bog vegetation from site during construction.
2. Compared to baseline, enhance the condition of peatlands outside afforested areas via restoration for the benefit of associated biodiversity, carbon storage and sequestration, and water management.
3. Eradicate, as far as practicable, invasive alien plant species from the site.
4. Maintain populations of breeding birds and bats, relative to natural variation.
5. Restore the over-run areas 1 and 2 to baseline or better habitat condition following the removal of temporary infrastructure.

4.4.3 Objectives

The objectives relating to each of the goals set out in Section 4.4.2 are summarised in Table 2. These objectives will remain in place for the duration of the wind farm's operation, unless otherwise agreed via the HMG.

Where relevant, the objectives include a summary of management requirements to meet them. A high-level summary of relevant indicators is also provided for each. Additional details on management requirement and monitoring are set out in Sections 6.0 and 7.0 respectively.

Justification for the scale of work required to meet Goal 2 which relates to blanket bog restoration is set out in Section 4.5.

Table 4-2: Goals & Objectives

No.	Objective	Relevant targets(s)	Amount/ location	Action	Timing	Indicators
Goal 1: Minimise, as far as practicable, the removal of peat and bog vegetation from Main Wind Farm Development Site during construction						
1.1	As far as practical retain excavated peat on site	Bog habitats	All peat excavated during construction – expected to be 125,180 m^3	Re-use excavated peat for on-site bog restoration and reinstatement work See Peat Management Plan (PMP) Technical Appendix 6-3, for a breakdown of volumes and details of handling requirements.	During construction See note in PMP, Technical Appendix 6-3 for details on timing for storage and re-use	Volume of excavated peat used in bog-restoration is 107,080m^3 or higher. Remaining excavated peat is used in reinstatement. Excavated peat used in peatland reinstatement and bog restoration is placed in conditions that prevent drying and associated carbon loss.
Goal 2: Compared to baseline, enhance the condition of peatlands outside afforested areas via restoration for the benefit of associated biodiversity, carbon storage and sequestration, and water management.						
2.1	Raise the water table in blanket bog habitat	Bog habitats	200 ha: All ditches within open habitats, outside infrastructure buffer areas as mapped on Figure 2 c. 162ha.[5] Keyholed and other areas of forest felling c. 24ha.	Block & infill ditches. Ground-smooth former forestry areas. Re-profile cutting faces. Restore / re-vegetate temporary areas such as the temporary construction compounds.	During or within two years of construction with repair as required for the duration of the HMP.	Water table is within 10cm of the surface on average (with a lower limit of 20cm depth e.g. during dry conditions), within the appropriate buffer distance of all blocked ditches (see peat restoration plan). Bog (inc. PB4, PB3, PF3 and PF2) vegetation in restored areas is in an improved condition compared to baseline data and more similar to that in a control site, as measured using suitable condition criteria.

[5] To be confirmed in post-consent for example depending on the final buffer distances of infrastructure and watercourses agreed on.

No.	Objective	Relevant targets(s)	Amount/ location	Action	Timing	Indicators
			Areas of historic peat extraction (c. 14ha).			Peat/ carbon accumulation as determined by depth measurements and presence of peat forming vegetation.
2.2	Reduce the risk of bog habitat transitioning to woodland and associate peat drying	Bog habitats	Areas where scrub is found within blanket bog habitat	Remove scrub. Pulling or cutting with brash removed from site.	During or within two years of construction with maintenance as required for the duration of the HMP.	Scrub is removed, with follow up-removal of any regenerating scrub if require. Areas identified as scrub removal areas remain scrub free.
Goal 3: Eradicate, as far as practicable, invasive alien plant species from the Main Wind Farm Development Site & HEA						
3.1	Remove and thereby reduce the risk of non-native species (inc., *Gunnera tinctoria, Aluns cordata, Cocosmia sp, Gaultheria mucronata* and *Rhododendron ponticum)* from displacing native species / natural and semi-natural habitats.	Bog habitats Other natural/ semi-natural habitats.	Everywhere they are found to occur on site.	Remove. Pulling or cutting/ digging with brash/ debris including soil potentially contaminated with roots or seed removed from site and disposed of appropriately.	During construction with maintenance as required for the duration of the HMP.	Non-native species are removed from site via appropriate methods. Follow up-treatments are applied as necessary. The site is free from invasive alien plant species.
Goal 4: Maintain populations of breeding birds and bats, relative to natural variation on the Main Wind Farm Development Site & HEA						
4.1a	Safeguard the population of kestrel by managing habitat structure to minimise structural diversity and vegetation height (create uniform short vegetation) in high collision risk areas to reduce suitability as prey habitat and deter foraging.	Kestrel	In keyholed areas of forestry around turbines.	Undertake ground smoothing as already planned for bog restoration in these areas.	See Goal 2.	See Goal 2, and Vegetation is short and uniform.
				Monitor prey abundance and kestrel activity and further manage	As part of wider bird activity and vegetation monitoring – See	Prey abundance is ≤ the density in open habitats elsewhere on site. Kestrel activity ≤ that in open habitats elsewhere on site.

No.	Objective	Relevant targets(s)	Amount/ location	Action	Timing	Indicators
				vegetation if required e.g. via infrequent mowing or strimming.	Goal 2 and Objective 4.2.	Kestrel collision mortality detected is < than expected without mitigation.
4.1b	Enhance nesting opportunities for kestrel	Kestrel	2-3 nest boxes	Mounted 4–6 m above ground, ideally on isolated trees, poles, or suitable structures that offer clear flight access, facing east or southeast, away from high disturbance areas.	Install- pre-construction if locations are not within the construction disturbance zone or within 1 year post construction in other areas. Monitor annually.	Nest boxes are installed. Kestrel use and fledge young from the nest boxes - nest box monitoring.
4.2	Safeguard the population of other birds (other than kestrel), at collision risk	Other birds at risk of collision	Within the site	Undertake bird activity and carcass searching to determine if collision risk and mortality are higher than predicted in the Chapter 5 (EIAR), e.g. due to changes in populations or flight patterns	Years 1, 2 and 3 post construction – continuing if required	Collision mortality detected is ≤ than expected Activity is ≤ to baseline
4.5a	Safeguard populations of breeding bird assemblages of open and semi- open/ forest edge habitats	Breeding bird assemblages : breeding **snipe** and Eurasian woodcock, yellow-hammer, skylark, willow	See Goal 2	Bog restoration is anticipated to increase invertebrate abundance and therefore foraging opportunities for these species. Noting that open ground species like snipe and meadow	See Goal 2	Breeding bird surveys Species diversity and populations are similar to baseline relative to natural regional variation – especially for those species associated of bog habitats.

No.	Objective	Relevant targets(s)	Amount/ location	Action	Timing	Indicators
		warbler and meadow pipit		pipit will likely benefit more than forest edge species like woodcock and willow warbler.		
4.6	Safeguard populations of bats that are at risk of collision mortality from turbines.	Bats at risk of collision: Common, Nathusius' and soprano pipistrelle, and Leisler's bat	Within the Main Wind Farm Development Site	Bat buffers will be implemented to reduce collision risk (key holing around turbines). Bat activity monitoring	Activity years 1, 2 and 3 post construction – continuing if required Carcass searching – if required	Activity levels are similar or< during EIAR surveys. If not, then other mitigation e.g. curtailment and carcass searching has been implemented as appropriate.
Goal 5: Restore the over-run areas 1 and 2 to baseline or better habitat condition following the removal of temporary infrastructure						
5.1	In over-run Area 1: Reinstate blanket bog to good condition in all areas impacted by the development following removal of temporary infrastructure	Bog habitats	Over-run Area 1, all areas impacted by the development	Ground smoothing and re-vegetation	Commencing within 1 year following removal of temporary infrastructure	Bog vegetation in restored areas is in a similar or improved condition compared to baseline data as measured using suitable bog condition criteria.
5.2	In over-run Area 2: Reinstate a mosaic of habitats as observed at baseline favouring those with higher biodiversity value such as dry grassland[6]	Other natural/ semi-natural habitats	Over-run Area 2	Seeding of reinstatement areas with suitable wildflower mix of local (Irish) origin Scrub planting to match the species present at baseline (low density 200 -	Commencing within 1 year following removal of temporary infrastructure	All habitats are reinstated to the same habitat type as baseline during reinstatement Within 10 years all habitats reach the same condition as baseline Within 10 years reinstated dry grassland habitats reach moderate condition, compared to poor condition at baseline via wildflower seeding.

[6] Note that the surrounding roads and substrate make this area largely unsuitable for bog or wetland restoration or creation.

No.	Objective	Relevant targets(s)	Amount/ location	Action	Timing	Indicators
				400 stems per ha in an organic pattern according to ground conditions)		

4.5 Justification for the scale of Bog Restoration (Goal 2)

Full workings and justification for the scale of blanket bog restoration required to result in enhancement of blanket bog biodiversity value compared to baseline are set out in the Peatland Restoration Plan (PRP).

In summary, calculations undertaken using the SSER biodiversity tool kit (SSE metric), indicated that a 32% net gain in habitat value (Biodiversity Net Gain, BNG) on site, can be achieved. This will involve restoration and creation c. **200 ha** of bog habitats in compensation for direct and indirect loss of c. **30 ha** of blanket bog and c. 36ha of other habitats predominantly commercial forestry (34ha). This is over the minimum 10% gain expected as a buffer in biodiversity net gain guidance, to avoid net-loss.

The calculations use time to target condition multiplier for bog restoration of 10 years and a difficulty of restoration multiple of moderate. This is based on the best available evidence for similar restoration projects.

In addition, bog restoration will benefit a range of species including amphibians and birds and bat species that favour these wet open habits, such as snipe, meadow pipit, sky lark and Leisler's bat. Water quality in adjacent watercourses may also be improved for fish and freshwater life as erosion of peat should be reduced, reducing particulate organic carbon in the connected watercourses.

Limitations

The BNG calculations were undertaken using the planning application site layout and habitat data. In addition, while multipliers for time to target condition and difficulty of restoration have been selected based on the best available scientific evidence, it is possible that conditions at the Proposed Development may result in restoration progress in faster, slower, or more or less effective than anticipated.

The following actions will therefore be undertaken:

Pre-construction:

- Habitat surveys are undertaken to determine any changes in habits since baseline,
- The area where peat cutting face re-profiling is proposed to the northwest of the site has a confirmatory field survey undertaken to confirm the restorable area,
- The baseline situation is up-dated.
- The results are integrated into the HMP.

Post-construction:

- The BNG calculation is up-dated and integrated into the habitat management plan.

The effectiveness of the restoration measures will be monitored in accordance with this HMP, and any revisions that are identified as required will be agreed with the HMG.

5.0 Baseline Conditions

Baseline conditions are set out in the EIAR, in particular the following documents:

- Technical Appendix 2-3: Forestry report
- Chapter 5: Biodiversity and associated Appendices:
  - Technical Appendix 5-1: Technical Habitat Report
  - Technical Appendix 5-2: Bird survey report
  - Technical Appendix 5-3: Bat survey report
  - Technical Appendix 5-4: Aquatic survey reports
  - Appendix 5-5: Appendix 5.5: Peatland Restoration (PRP) and Habitat Management Plan (HMP) – this document.
  - Technical Appendix 5-6: Habitat Condition Assessment Report
  - Technical Appendix 5-7: Marsh Fritillary Survey report
  - Technical Appendix 5-8: Avian Collision Risk Model Report
- Chapter 6 and associated Appendices:
  - Technical Appendix 6-2: Peat Landslide Hazard Risk Assessment
  - Technical Appendix 6-3: Peat Management Plan
- Chapter 8: Air Quality and Climate

5.1 Control Area

Ideally, a control plot of good condition blanket bog that the habitats within the bog restoration area that could reasonably be expected to revert to following drain blocking will be identified within the Main Wind Farm Development Site or HEA and monitored to aid in evaluation of bog restoration success and in setting of site-specific vegetation targets for bog habitats (e.g., % cover of sphagnum etc.). If a suitable area cannot be found the bog habitat condition criteria from the Irish Habitats Wildlife Manual or similar will be used instead.

6.0 Implementation Methods

6.1 Bog Restoration Including Re-use of Excavated Peat

6.1.1 Scrub Clearance

Scrub vegetation is present and widespread throughout all the site's Candidate Areas (areas of bog earmarked for restoration), colonising the ground from the areas of commercial forestry. As scrub is of limited conservation value in the context of the Main Wind Farm Development Site and contributes to drying of peatland, removing it is considered desirable to aid peat re-wetting and promote growth of Sphagnum mosses. Sphagnum mosses are a critical part of any peatland restoration effort due to their ability to absorb and retain moisture, acidify the surrounding environment and thus, slow plant decay and allow greater carbon storage in the soil. Therefore, scrub clearance will be undertaken as part of the planned HMP works.

For the Proposed Development, this will be achieved by using a brush cutter and chainsaw and managed by being cut up into smaller, more manageable pieces before being mulched. For sections too large to be cut by a chainsaw, they will be left on the bog surface to promote biodeterioration, biofragmentation and ultimately assimilation into the underlying peat. It is unlikely that other conventional scrub clearance methods, such as hand pulling or herbicide spraying, would achieve an acceptable return on investment at this site.

6.1.1.1 Conifer and Scrub Regeneration Control

It is expected that following ground smoothing and ditch blocking, shrub and conifer regeneration will be reduced due to the higher water table making growing conditions less suitable.

However, due to the presence of conifer plantation and scrub areas within areas adjacent to the peatland restoration area, some conifer and scrub regeneration is expected. Therefore, all regeneration will be monitored, and the removal carried out when required, to maintain open vegetation and avoid the area transitioning to forest/ scrub. The frequency at which regeneration would need to be removed will be subject to the speed of regeneration and will be determined following post-implementation monitoring (Section 7.9.2).

6.1.2 Ground/Surface Smoothing

This method is proposed for areas where felling of conifer plantations is undertaken as part of the works for the Main Wind Farm Development Site. Note however that it will also be considered in areas where the ground is rough due to for example the presence of stumps, ridge and furrow or piles of formally excavated peat which reduce the effectiveness of re-wetting via ditch blocking alone.

Again, owing to the widespread legacy ditch network that has lowered groundwater levels at Muingmore from the ridge/furrow pattern across much of the site, ground/surface smoothing will aid the regeneration of the peatland environment by encouraging water table rebound and vegetation recovery. Additionally, in the areas where conifer plantations have been cultivated, the ridge/furrow pattern across the legacy forestry area will benefit significantly from ground smoothing.

By manipulating the topography and creating a more uniform surface, it allows the natural hydrological function of the area to be restored and encourage growth of advantageous peat-forming vegetation like Sphagnum mosses. The primary means of ground/surface

smoothing that will be implemented are inverting any tree stumps within the candidate areas, ditch blocking, compacting the land with machinery, covering the surface with mulch, and infilling drains.

6.1.2.1 Re-vegetation

Re vegetation is not anticipated to be necessary in open areas of the site where PB4 vegetation will transition naturally to PB3 vegetation as the water-table rises.

In those areas where vegetation is absent or has been removed, for example following tree clearance and ground smoothing, the area will be allowed to revegetate naturally as it is anticipated that there will be a sufficient seed bank available from the large expanse of blanket bog adjacent. In addition, there are likely to be viable heather seeds (and seeds of other Ericoids) within the existing seedbank from before the area was planted with trees. Relatively large heather seed banks can survive beneath conifer plantations for 40 years and under some circumstances for more than 70 years[7].

Restoration projects on other afforested sites have had success without using re-seeding/re-vegetation methods[13], and re-seeding/re-vegetation is only reported to be necessary in restoration of bare peat areas with significant erosion[13].

On the basis of the above, there is a high likelihood that the natural regeneration of bog vegetation will be successful. However, this will be monitored and in the unlikely event that the natural regeneration of bog vegetation does not take place within a reasonable timescale, remedial measures such as seeding or plug planting will be considered in consultation with the HMG and implemented where required.

6.1.3 Ditch Blocking and Re-use of Excavated Peat

This method involves creating a blockage (or dam) within a ditch, preventing the drainage channel acting as a conduit for water flow and draining the peat soils, thus raising the water table. As part of the earthworks associated with the Proposed Development, peat will be excavated from areas of hardstanding.

There are three approaches for ditch blocking that will be implement on the Main Wind Farm Development Site, generally constrained by the width of the drainage channel:

- Dams (wooden and/or peat) with infilling from excess peat on all ditches;
- Zipping / zippering on ditches <1.5 m wide; and
- Dams (wooden and/or peat) on all ditches.

The management of the peat during excavation and storage will be delivered by the Peat Management Plan (PMP) (**Technical Appendix 6-3** of the EIAR). The excavated peat provides a great opportunity for the improvement of hydrogeology and peatland habitats at the Main Wind Farm Development Site.

At the Main Wind Farm Development Site it is intended that suitable ditches (those not within the buffer of natural watercourses) are entirely backfilled with excavated peat from earthworks within the development area. Due to the length of ditches to be infilled, dams will be placed at routine 10-20m intervals to maximise stability and water retention of the peat within the legacy ditch. Alternating wooden and peat dams will be used at the Main Wind

[7] Pywell, R.F., Pakeman, R.J., Allchin, E.A., Bourn, N.A.D., Warman, E.A.., Walker, K.J (2002) The potential for lowland heath regeneration following plantation removal. *Biological Conservation*, Volume 108, Issue 2, pp247-258.

Farm Development Site owing to their greater longevity in the acidic peat environment and very low slopes observed on the Main Wind Farm Development Site whilst providing a resource efficient solution. Peat dams are generally unsuitable where the depth of solid peat at the base of the drain is ≤50cm.

Ditches will have surface vegetation removed from the sides and base of the ditch prior to the emplacement of excavated peat and any vegetation will be placed on any bare peat. Dams will be keyed (extended), into the deep peat at either side of the ditch to provide the best watertight seal that can be achieved whist ensuring stability. When using peat to form the dam, this will be done up to a maximum ditch width of 1.5m and depth of 1.2m. Dried out or unconsolidated peat will never be used, only highly humified, fully waterlogged peat will be used. As the peat is inserted into the drain, it will be compacted and upon completion the dams top will be extend approximately 30cm above the surface of the bog and covered with a living layer of peatland vegetation.

Ditches will be infilled up to a 30m buffer from proposed watercourses. The end point of the infilling will be secured with a dam to maximise stability.

Should it be impractical to infill the ditches within the Candidate Areas, zipping / zippering and ditch blocking using wooden dams or peat recovered from a small borrow pit near to the planned ditch dam will be used as to raise groundwater levels.

Zipping is a form of re-profiling that is typically used in conjunction with wave damming. Dams are formed every 8 m with the remaining drain line between each dam “zipped”. Unlike other forms of re-profiling, this technique completely in-fills the drain void and therefore natural surface flow path ways are instantly restored. Zipping will be prioritised on ditches <1.5 m wide to reserve peat infilling on ditches wider than 1.5 m in the unlikely event that there is insufficient peat to infill all ditches within the Candidate Area.

Dams without the associated backfilling with peat will follow the same construction methodology and criteria as those ditches for peat infilling however these will retain water behind the dams, with excess water encouraged to spread out over the surface of the peatland. Vegetation within the ditches will be left in place while these dams are put in place and water levels rise.

In terms of re-wetting potential current BNG calculations assume a 30 m buffer from infrastructure for condition enhancement due to its drainage influences, and no buffer from watercourses (assuming ditch blocking but not infilling within the 30m watercourse buffer).

6.1.4 Hag Reprofiling

The HEA to northwest of the Main Wind Farm Development Site, has historically been used for the removal of peat, with bare faces of peat exposed at the edges of where peat was cut away remaining. The angle of the peat face here is too great for vegetation to establish and reprofiling is needed to achieve an appropriate angle to encourage vegetation to return whilst minimising erosion. Here, the layer of live vegetation including its roots will be removed back far enough to allow the reprofiled face maintains and angle around 30 degrees (typically around 2 m).

The peat face will be reprofiled to 30 degrees and compacted so there are no air pockets or cavities where water could escape. The reserved vegetation will then be stretched out across the reprofiled face. If there is insufficient vegetation to provide a cover of the reprofiled face then vegetation will be recovered from areas of excavation in the Main Wind Farm Development Site or by creating a small pit near the reprofiled area and transferring vegetation from the pit to the reprofiled face, stretching the adjacent vegetation over the pit area to so it also has been protected. The layer of vegetation will then be compacted into the peat to providing good contact of roots with the underlying peat.

6.2 Kestrel Nestbox Installation and Cleaning

Three kestrel nest boxes will be installed on site to support kestrel breeding opportunities. Boxes will be mounted 4–6 m above ground, on isolated trees, poles, or other suitable structures that offer clear flight access. The entrance will face east or southeast to avoid prevailing winds and excessive rain exposure while providing morning warmth. Boxes will be positioned with an open outlook over existing peatland – or open grassland - away from high disturbance areas and maintained to ensure continued suitability.

At least one nest boxes will be installed pre-construction away from the disturbance zone. The remaining two will be installed at the same time if locations are not within the construction disturbance zone or within 1 year post construction in other areas.

Depending on use (see monitoring Section 7.10.3), by kestrel or other birds such as jackdaw, the boxes will be cleaned out to maintain their suitability for kestrel nesting.

6.3 Fencing

Due to the current lack of grazing pressure at the Main Wind Farm Development Site, fencing will not be required to protect the regenerating habitats within the habitat management area from sheep or native herbivores such as deer. Should livestock grazing be proposed in this area at any point, the potential requirement will be reviewed in consultation with the HMG and included in the HMP if required.

6.4 Temporary Construction Compound Restoration

Only materials arising from the excavations will be utilised as part of the restoration scheme for the Temporary Construction Compound. Based on the existing habitats present across the Main Wind Farm Development Site these materials are very likely to be suitable for blanket bog restoration if they are handled and stored appropriately, and most should contain an existing bog vegetation seedbank. Proposal for blanket bog restoration within these areas will be provided in the HMP, post-construction based on fine-grained observations of the area at that time.

6.5 Invasive Alien Plant Species Control

Invasive species can spread rapidly and form dominant stands that exclude most other plant species, causing large scale ecological damage.

Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species, as amended, together with Commission Implementing Regulation (EU) 2016/1141 and Implementing Regulation (EU) 2019/1262, mandate measures to prevent introduction, monitor and eradicate or control certain non-native invasive species i.e. those identified in the commission implementing regulations, which provide the list of 114 invasive alien species of Union concern. In addition, there are another six implementing regulations[8].

Specific Irish legislation relating to invasive alien species includes:

- S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011, as amended.
- The European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374 of 2024)

[8] https://environment.ec.europa.eu/topics/nature-and-biodiversity/invasive-alien-species_en

The invasive alien plant species recorded at the Main Wind Farm Development Site are:

- Rhododendron (*Rhododendron ponticum*) and *Gunnera tinctoria* (Giant Rhubarb), listed as Invasive Alien Plant Species (IAPS) on,
    - The 3rd Schedule of S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011, and
    - The 1st schedule of The European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374 of 2024)
- Prickly heath (*Gaultheria mucronata*)
    - Not listed in the legalisation above but is on the Amber list of invasive species Ireland9.

Plants of IAPS identified during EIAR baseline surveys and any additional IAPS plants on Site that have established since habitat surveys were undertaken will be removed to prevent further spread that would harm the ecosystem.

6.5.1.1 Methods

Removal will be undertaken following applicable best practice guidance[10,11,]. Due to the small size of the stands, mechanical, non-chemical methods may be sufficient, however if there are more plants by the time removal works are undertaken chemical methods may be necessary. Clearance will be carried out in spring before the plants flower. Biosecurity measures to limit the risk of spread during construction will be set out in the CEMP.

Vegetation monitoring for the HMP will be used to determine the need for additional treatments/ removals.

[9] https://invasivespeciesireland.com/wp-content/uploads/wp-post-to-pdf-enhanced-cache/1/amber-list-recorded-species.pdf

[10] SEPA (2020) *Water Use Supporting Guidance (WAT-SG-18) Control of Plants in or Near to Water*.

[11] Invasive non-native species | Scottish Environment Protection Agency (SEPA) (accessed Sep 2025)

7.0 Outline Monitoring Plan

All monitoring will be undertaken by suitably qualified and experienced technical experts.

7.1 Good Practice Data Collection, Management Analysis & Reporting

This HMP will run for a duration of 35 years, the lifetime of the wind farm. During its lifetime it may pass between multiple ecological constants and site owners etc.

The accuracy of monitoring and therefore the quality of adaptive management decision based on the evidence collected will depend on consistent comparable methodology.

This HMP when refined post-consent, will provide transparent methodology with clear sampling locations, timings and protocols that can without prior experience be accurately replicated by a suitably competent technical expert.

It will also provide a set of standardised data collection forms, database structure, and data analysis protocols and reporting templates.

All data from all years will be collated in a single database held by the Proposed Development operator to permit for continuity and ease of data analysis. This can be made available to which ever consultancy is undertaking monitoring in any given year.

This will mean that year on year data and statistics will be comparable, suitable for detecting change over time and decision useful.

The purpose of the proposed monitoring of bog habitats is to determine whether the restoration work is on track to meeting its targets, goals, and objectives, or needs adjustment. Monitoring will reflect the key ecosystem attributes as summarised in **Table 7-1.**

7.2 Ecosystem Level Considerations

Table 7-1sets out the key areas of ecosystem condition, structure and function that will be considered in habitat restoration projects as set out by the Society for Ecological Restoration[12]. It additionally provides site specific consideration for Muingmore.

Table 7-1: Monitoring Considerations

Attribute	Relevance to The Proposed Development	Monitoring Requirement
Absence of threats	Potential threats include: conifer regeneration, drainage, grazing (currently low), construction work, fire.	Signs of conifer regeneration, fire, ground disturbance and grazing impacts will be recorded during vegetation monitoring.
Physical conditions	Regeneration of target of bog will require removal of overshading conifers and management of water levels within the peat.	Confirm completion of ditch blocking, cutting face re-profiling, felling, and ground smoothing in appropriate locations. Monitor water table levels in peat at both pre-felling and post-restoration stages.
Species composition	Species composition should be similar to areas of existing target habitats within	Information on species composition and how reference and restored areas

[12] https://www.ser.org/general/custom.asp?page=serstandards

Attribute	Relevance to The Proposed Development	Monitoring Requirement
	or adjacent to the peatland restoration area.	compare to each other in terms of blanket bog and heath condition will be made possible via vegetation monitoring.
Structural diversity	As re-establishing habitat matures, different canopy levels should develop (including moss and dwarf shrub layers).	Information on vegetation structure will be recorded during vegetation monitoring.
Ecosystem function	The habitat should be self-perpetuating over time with little or no active management and should start to sequester carbon/ accumulate peat.	A record of management requirements will be kept, this can be used to illustrate declining intervention needs over time. Peat accumulation data or other measures of peatland productivity will be taken to assess if the habitat is healthy enough to sequester carbon.
External exchanges	The habitat should be connected to the wider habitat network e.g. via habitat links, gene flows and landscape flows	This will have largely been achieved via choosing which locations to restore bog in, and enhancing them to a better condition more reflective of the wider bog landscape.

The ecological recovery wheel could be used to visualise and track progress against these criteria over time Diagram 1 1. Resources to support this including blank wheel excel templates, details of the rating system and attributes tables can be found on the SER website: https://www.ser.org/page/Standards-Tool.

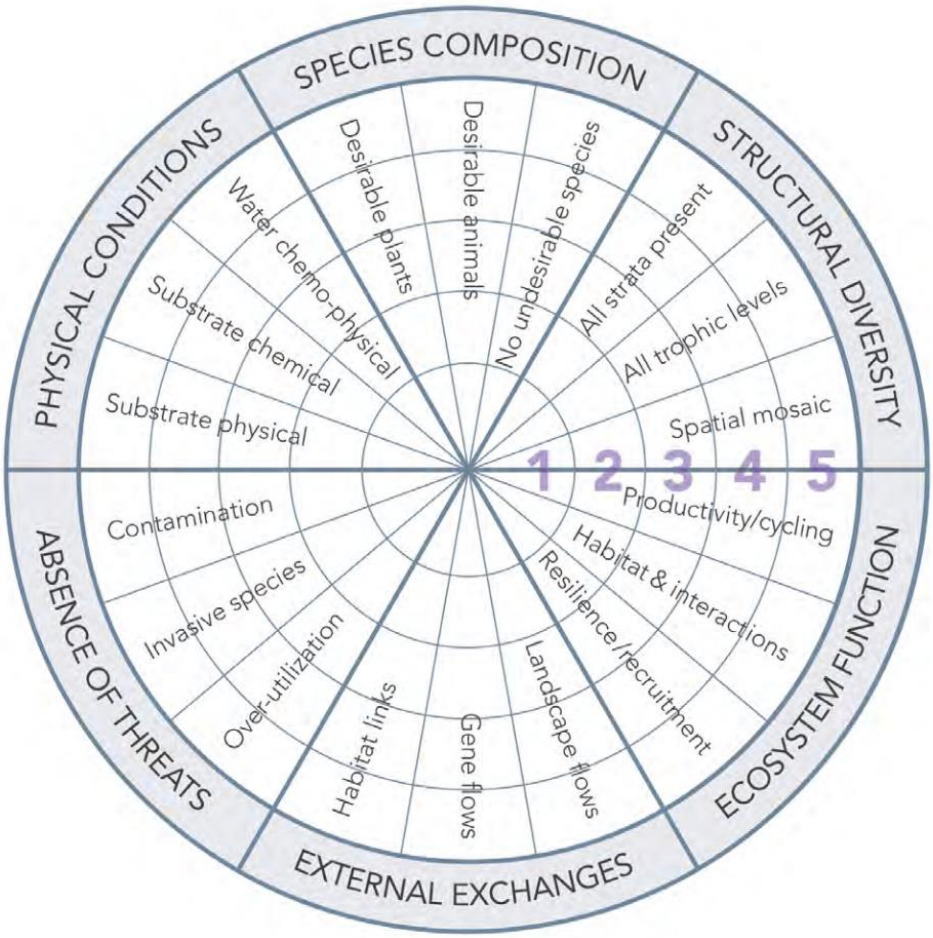


Diagram 1: SER 5 Star Ecological Recovery Wheel[13]

7.3 Indicators

Indicators are specific, quantifiable measures of attributes that directly connect longer-term goals and shorter-term objectives. Ecological indicators are variables that are measured to assess changes in the physical, chemical, or biotic ecosystem attributes as guided by the reference model.

The following indicators are cited in Table 2 as required to monitor progress toward achieving the HMP goals and objectives:

- Bog habitat condition;
- Bog restoration maintenance requirements;
- Vegetation structure;
- Presence of scrub in bog habitats;
- Water table depth;
- Peat accumulation;

[13] https://www.ser.org/page/standardsguidelinesprinciples

- Presence of non-native species;
- Kestrel breeding and nest-box use;
- Kestrel prey abundance;
- Breeding bird diversity and abundance;
- Bird and bat flight activity;
- Bird and bat collision mortality.

7.4 Monitoring Methods Summary

The methods that are proposed to monitor the above indicators set out in following Sections.

Depending on the results of these surveys, additional monitoring approaches will be required to assess progress toward objectives and inform management. For example, if herbivore impacts are highlighted as a potential issue during habitat monitoring, then grazing impact surveys will be implemented alongside other measures such as reduced stocking or fencing as appropriate at the time. Any such measures will be agreed with the HMG as part of the HMP review process (See Table 8-1).

Confirmatory vegetation surveys, bat activity surveys and dipwell monitoring will commence pre-construction to provide an updated baseline.

7.5 Pre-implementation Confirmatory Peatland Surveys & Detailed Bog Restoration Plan

7.5.1 Restoration Planning

Prior to restoration work a more detailed plan of ditch block spacing and locations will be developed including details of which sections will be infilled.

7.5.2 Peat cutting face mapping

A mapping exercise of the peat cutting faces will be undertaken within the HEA. These data will include dimensions of the cutting faces and their hydrological setting. This will highlight any constraints to the proposed restoration measures in the area.

7.6 Ditch Restoration Effectiveness Checks

7.6.1 Ditch blocks

These surveys will provide data in relation to the following indicators:

- Water table

For the bog restoration to be successful the dams of drains that are created during the restoration process need to remain effective. During drain blocking, all of the dam locations will be recorded. In the first two monitoring years, all the dam locations will be checked for signs of effectiveness, damage and requirements for maintenance. In subsequent monitoring years, especially if dam performance has been good with little maintenance requirement, then it may be appropriate to spot check only a proportion of dam locations.

7.6.2 Ground Smoothing

These areas will be checked at least monthly in the first six months and then at a frequency dependant on findings and re-vegetation progress for any signs of erosion to inform the need for surface protection during the revegetation process.

7.6.3 Cutting Face Reprofiling

These areas will be checked at least monthly in the first six months and then at a frequency dependant on findings and re-vegetation progress for any sings of erosion to inform the need for surface protection during the revegetation process, or additional re-profiling effort.

7.7 Water Table Monitoring - Dipwells

These surveys will provide data in relation to the following indicators:

- Water table

Dipwells, or a similar method for monitoring water table levels, will be installed within the bog restoration area during baseline monitoring to provide an overview of water table level fluctuations across the area. Locations will give representative coverage of the bog restoration area and control area, a minimum of twenty monitoring locations will be selected. The locations of these monitoring sites will coincide with some of the vegetation quadrat locations to improve the interpretability of the vegetation data set. The grid reference for each monitoring location will be recorded to allow relocation.

Unless the water table monitoring method selected allows for continuous data logging at set intervals, quarterly monitoring of dipwells will be undertaken in each monitoring year, to measure water levels and assess if they are high enough to promote bog vegetation growth.

Dipwells show the highest water level and lowest water level experienced since the last time the data was recorded. There are two foam balls which are moved by the water level, when a high level is recorded the top foam ball moves up and stays there unless the water level exceeds this measurement, similarly the other foam piece shows the lowest water level recorded. When taking water level data from a dipwell the difference between the distance from the top of the tubes to ground level and the distance from the top of the tubes to water level is calculated to determine the below ground water level.

7.8 Peat Accumulation

A range of approaches to monitoring peatland productivity are available[14], for the purposes of the Proposed Development, the following methods that will be considered in consultation with the HMG, in addition to vegetation surveys include:

- Erosion pins, these are placed in the ground and the distance from the ground surface to the top of the pin is measured[15]; and

[14] Short, R.,Robson, P. (2016) An innovative approach to landscape-scale peatland restoration. CIEEM In-Practice, Issue 93, September 2016

[15] Natural England (2011) A Review of Techniques for Monitoring the Success of Peatland Restoration. Natural England Commissioned Report NECR086.

- Sediment cores, here a core of the soil/ peat will be taken and the distance from the layer containing forestry debris (baseline) to the soil surface measured[16].

A combination of the above methods may provide the most reliable results. Measurements will be taken quarterly in each monitoring year, at the same times as water table monitoring to allow for contraction and expansion of peat through seasonal cycles.

7.9 Bog Habitat Mapping and Condition Monitoring

Botanical monitoring will be undertaken during the optimal survey period for plant species (May – August inclusive). The first year of botanical monitoring will be undertaken during the summer prior to bog-restoration to provide a baseline. Further monitoring (to assess changes to the baseline) would then take place annually in the first three years following restoration, and then again in year five and ten post-restoration, with the need for further monitoring determined in year ten.

These surveys will provide data in relation to the following indicators:

- Habitat extent/ mapping.
- Bog habitat condition.
- Kestrel prey abundance.
- Vegetation structure in relation to foraging habitat suitability for bats and kestrel.

7.9.1.1 Habitat Surveys and Kestrel Prey Abundance

To permit accurate mapping of vegetation cover and change over time, aerial imagery of a suitable resolution will also be obtained, ideally for the same month but at least for the same season, in each monitoring year. Potential sources of imagery include satellite data, and specially commissioned drone.

The methods of botanical monitoring will be refined in the post-consent version of the HMP and will allow for the specific monitoring against the HMP objectives, as well as being based on the standard guidelines set out in 'Best Practice Guidance for Habitat Survey and Mapping' developed by the Heritage Council of Ireland [17]. Habitats will be classified using habitat descriptions and codes published by the Heritage Council in 'A Guide to Habitat Types in Ireland'[18].

To assess the conservation status (condition), of bog habitats a series of 2x2 m plots will be assessed across he proposed bog habitats within the HMA to provide more fine scale evidence of the habitat type. The distribution of plots is yet to be confirmed but will aim to capture the broad variation in conditions across the whole restoration area, a W transect is often suitable in these circumstances. Habitat mapping and quadrata data collection will cover the keyhole areas around turbines to enable data collection in relation to bat and kestrel foraging habitat suitability, and ground smoothing bog-restoration success.

At each of these monitoring plots all species within the plot will be identified and the percentage cover of each species, in particular Sphagnum moss species will be recorded. In

[16] Lucchese, M., Waddington, J. M., Poulin, M., Pouliot, R., Rochefort, L., & Strack, M. (2010) Organic matter accumulation in a restored peatland: evaluating restoration success. Ecological Engineering 36. PP: 482-488.

[17] Smith, George F., et al. "Best practice guidance for habitat survey and mapping." The Heritage Council: Ireland (2011)

[18] Fossitt, J.A., 2000. A guide to habitats in Ireland. Heritage Council/ Chomhairle Oidhreacht

addition, habitat condition criteria will be assessed within each plot and a 20m radius according to the relevant IWM assessment methods. To assess if the goals and objectives of the HMP are being met, the criteria recorded will include:

- Signs of threats such as grazing or ground disturbance or fire;
- Vegetation structure;
- Vegetation species composition;
- Signs of kestrel prey e.g. number of vole latrines;
- Cover/ presence absence of regenerating scrub or invasive alien plant species .

7.9.1.2 Bat and Kestrel habitat management monitoring in keyhole areas

Bat mitigation buffers will be monitored in years 1, 2 and 3 following construction to ensure vegetation clearance and management measures have resulted in the desired habitat conditions. Once these conditions have been achieved, habitats will be maintained in this manner for the duration of the operational phase.

This vegetation monitoring programme will be captured within the wider vegetation and habitat monitoring surveys and will help ensure there are no significant adverse effects on bats.

7.9.2 Scrub monitoring

In addition to recording scrub in the habitat mapping & condition surveys a combined drive over and scrub quadrat survey will be undertaken. Areas of scrub will be roughly mapped during a site drive around.

In areas where scrub removal is planned to enhance bog condition 50 x 50 m quadrats will be set up to capture c. 20% to the total scrub area. Within these the density and height of scrub will be recorded.

Surveys will be undertaken prior to works and subsequently to determine the requirement for follow-up management actions (Table 8-1).

7.9.3 Non-native species (NNIS) surveys

In addition to recording any IAPS during habitat mapping and condition surveys, areas where NNIS have been record historically will be revisited during monitoring surveys (see Table 8-1), and the area and distribution of plants within these carefully documented.

Plans for the removal of these will be written up and implemented (see Section 6.5), subsequent monitoring rounds these areas will be resurveyed to check to any regeneration.

7.10 Birds

7.10.1 Breeding bird diversity and abundance

For comparability, these surveys will reflect the baseline survey methodology.

In designated survey years (see Table 8-1), a total of three survey visits will be conducted in each survey year between April and July. Surveys will be carried out within the Main Wind Farm Development Site & HEA following:

- ,
  The O'Brien and Smith (1992) methodology which is suitable diurnal species and lowland sites[1523].
- Dusk surveys to record crepuscular and nocturnal species, including woodcock and owls. These surveys will be conducted following the methodology outlined by Gilbert et al.*[12]* for Eurasian woodcock and modified for collection of data on other nocturnal species observed.

7.10.2 Flight Activity and Carcass Searching

Based on current best-practice guidelines (SNH, 2009) and in accordance with EC Recommendation (C/2022/3219), a targeted range of flight activity surveys and collision monitoring (carcass searching) will be undertaken during the breeding and non-breeding seasons in years 1, 2 and 3 post construction, to monitor the rate of avian turbine collisions.[19] Six hours of survey per vantage point per month will be carried out for flight activity surveys and one round of carcass searches per turbine per month will be carried out. These surveys will be carried out by qualified ecologists. The results of each year of monitoring will be presented in a report that will be submitted to the competent authority and NPWS. The need for further monitoring thereafter will be agreed with the competent authority and in consultation with the NPWS.

7.10.3 Kestrel Nesting Success

Kestrel next boxes will be monitored for use by kestrel or other species. Monitoring will be timed to capture nest box use and likely fledging success (1-2 survey visits/ monitoring year).

Boxes will be monitored annually inform nestbox cleaning and maintenance needs.

7.11 Bats

7.11.1 Pre-Construction

To confirm the accuracy of the baseline results a year of confirmatory surveys will be undertaken for bats immediately prior to construction within the Main Wind Farm Development Site. This will involve three rounds of static detector surveys (spring, summer and autumn) as per the latest NatureScot (2021) guidance.

The results of these surveys will be used to provide an updated baseline environment, for bats, and will form the basis of the post-construction monitoring programme. For example, in the event of high levels of activity at certain locations across the Main Wind Farm Development Site, post-construction monitoring will be adapted to pay particular attention to this location.

[19] Scottish Natural Heritage. (2009). *Monitoring the impact of onshore wind farms on birds*. SNH Guidance Document. Inverness: Scottish Natural Heritage.

Following this additional year of pre-construction monitoring, the results will be used to assess the precise requirements for post-construction monitoring, including methods, timing and duration.

7.11.2 Post-Construction

7.11.2.1 Activity and fatality monitoring

Post-construction monitoring will be carried out in line with commitments made in respect of the Proposed Project and in accordance with EC Recommendation (C/2022/3219) and will be seen as an opportunity to obtain data on bat/turbine interactions and to allow adaptive management of the proposed mitigation measures.

The post-construction monitoring programme will consist of:

- Static detector surveys: these surveys will allow for a valid comparison of bat activity and Main Wind Farm Development Site usage with pre-construction levels. Following NatureScot (2021) guidance, the surveys are to be conducted during years 1, 2 and 3 post construction to allow for annual variation and cumulative effects. Reports will be submitted to the competent authority and NPWS following each year of surveys. Surveys will follow baseline survey methods, as outlined in NatureScot (2021) guidance. After three years of post-construction surveys, the monitoring programme may be extended or halted based on the results and following agreement with the competent authority and NPWS.
- Fatality monitoring: if this is determined to be required following the additional year of pre-construction monitoring (i.e. due to high levels of bat activity), this will initially be conducted during years 1, 2 and 3 post construction to allow for annual variation and cumulative effects. The comprehensive fatality monitoring programme for birds as described above will be extended and duplicated to bats for the first three years per the post-construction monitoring requirements recommended by NatureScot (2021). After three years of post-construction surveys, the monitoring programme may be extended or halted following agreement with the competent authority and NPWS.

The results of the post-construction monitoring surveys will be used to determine whether further mitigation measures are required.

7.12 External Factors

It is important to note that external factors such as climate change and herbivore and wild bird and bat populations can influence habitat restoration success and species use of the site. Over the lifetime of the Proposed Project it is possible that climate change will affect the habitats on site and in the surrounding area. This will be taken into account during monitoring and reporting and is another reason why a control site in relation to bog restoration is important.

7.13 On-going Management and Maintenance

The requirement for on-going management and maintenance will be determined based on survey results. Requirements may include:

- Repair of dams etc., in the peat restoration areas.

- Scrub control.
- Non-native species control.
- Nest- box maintenance.

8.0 Schedule

An outline timetable for the implementation and monitoring works set out in this HMP is provided in **Table 8-1**.

Table 8-1: Outline Schedule of Works (Required, as needed based on monitoring results)

Task	Pre-construction	Construction	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20	Year 25	Year 30	Year 35
Enabling Tasks													
Form HMP working group (HMG)													
Refine HMP in preparation for implementation													
Capital Works													
Re-use of excavated peat													
Bog restoration													
Temporary construction compound restoration													
Scrub control													
Non-native species control													
Kestrel nest box installation/ cleaning													
Monitoring & Associated Reporting													
Habitat mapping and Condition Surveys													
Dipwells[20]													

[20] Monitoring for baseline will be undertaken pre-bog restoration ideally over two years. Subsequent monitoring will commence post-bog restoration which could be anytime between year 1 and 4.

Task	Pre-construction	Construction	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20	Year 25	Year 30	Year 35
Bog Restoration Checks (Drain Blocking, Ground smoothing, Hag-reprofiling)[13]													
Scrub surveys													
Non-native species surveys													
Kestrel nest-box surveys													
Bird Flight Activity and Carcass Searching													
Bat activity pre-construction													
Bat activity post-construction													
Bat carcass searching													
HMP Review and Adaptation													
HMP review and updates													
Ongoing adaptive management via agreement with HMG													

9.0 Evaluation of Performance against Goals and Objectives

Progress toward achieving the goals and objectives set out in Section 4.0 of this HMP will be evaluated using a traffic light system (see Table 9-1 and Table 9-2 for a template and hypothetical examples).

Evaluation of progress towards the HMP goals and objectives will be undertaken every five years as part of the HMP review/ adaptive management approach. This will be the responsibility of the windfarm operator. All goals and objectives will be considered to apply to the lifetime of the Proposed Development unless otherwise agreed by the HMG or set out in the schedule of works (for outline see Table 8-1).

Table 9-1: Traffic Light System

Met	Goal/ Objective has been met overall e.g., in all management areas or in terms of total figures across the site.
Partially met	Goal/ Objective has been partially met, e.g., it has been met in some areas but not others or progress overall is in the correct direction but has not reached the desired conditions.
Not met	Goal/ Objective has not been met, e.g., the objective has not been achieved in any area or, overall there has been no or negative progress toward meeting desired conditions.
Unclear / No data	Goal/ Objective has not clearly been met, e.g., because there are insufficient data to assess progress.

Table 9-2: Progress against Goals and Objectives Template with Hypothetical Examples

Relevant targets(s)	Amount/ location	Action	Timing	Indicators	Progress (with example classification & text)
Goal 1: Minimize, as far as practicable, the removal of peat and bog vegetation from site during construction					
Objective: 1.1 As far as practical re-wet and retain excavated peat on site					
Bog habitats	All peat excavated during construction – 80,167 m^3	Re-use excavated peat for on-site bog restoration and reinstatement work See Technical Appendix 6.3, for a breakdown of volumes and details of handling requirements.	During construction See note in Technical Appendix 6.3 for details on timing for storage and re-use	Volume of excavated peat used in bog-restoration is 58,000m^3 or higher. Remaining excavated peat is used in reinstatement. Excavated peat used in peatland reinstatement and bog restoration is placed in conditions that prevent drying	e.g. *The estimated volume of peat has been used at the planned locations within the planned timescale*

Relevant targets(s)	Amount/ location	Action	Timing	Indicators	Progress (with example classification & text)
				and associated carbon loss.	
Goal 2: Enhance the condition of remaining peatlands out with afforested areas to result in enhancement of blanket bog biodiversity value compared baseline.					
Objective: 2.1 Raise the water table in blanket bog habitat					
Bog habitats	177 ha: All ditches within open habitats, outwith infrastructure buffer areas as mapped on Figure 02 c. 139ha. Keyholed and other areas of forest felling c. 24ha. Areas of historic peat extraction (c. 14ha).	Block & infill ditches. Ground-smooth former forestry areas. Re-profile cutting faces. Restore / re-vegetate temporary areas such as the temporary construction compound.	During or within two years of construction with repair as required for the duration of the HMP	Water table is within 10cm of the surface on average (with a lower limit of 20cm depth e.g. during dry conditions), within the appropriate buffer distance of all blocked ditches (see peat restoration plan). Bog (inc. PB4, PB3, PF3 and PF2) vegetation in restored areas is in an improved condition compared to baseline data and more similar to that in a control site, as measured using suitable condition criteria. Peat/ carbon accumulation as determined by depth measurements and presence of peat forming vegetation.	*e.g. Ditch blocking ground smoothing and re-profiling were completed on time in most areas except for xxx however bad weather had delayed work and pushed completion back by a season.*
Objective 2.2: Reduce the risk of bog habitat transitioning to woodland and associate peat drying					
Bog habitats	Areas where scrub is found within blanket bog habitat	Remove scrub. Pulling or cutting with brash removed from site.	During or within two years of construction with maintenance as required for the duration of the HMP	Scrub is removed, with follow up-removal of any regenerating scrub if require. Areas identified as scrub removal areas remain scrub free	*e.g. Scrub control has not yet been started due to contractual issues. Completion is now a year overdue.*

Appendix A Figures 01

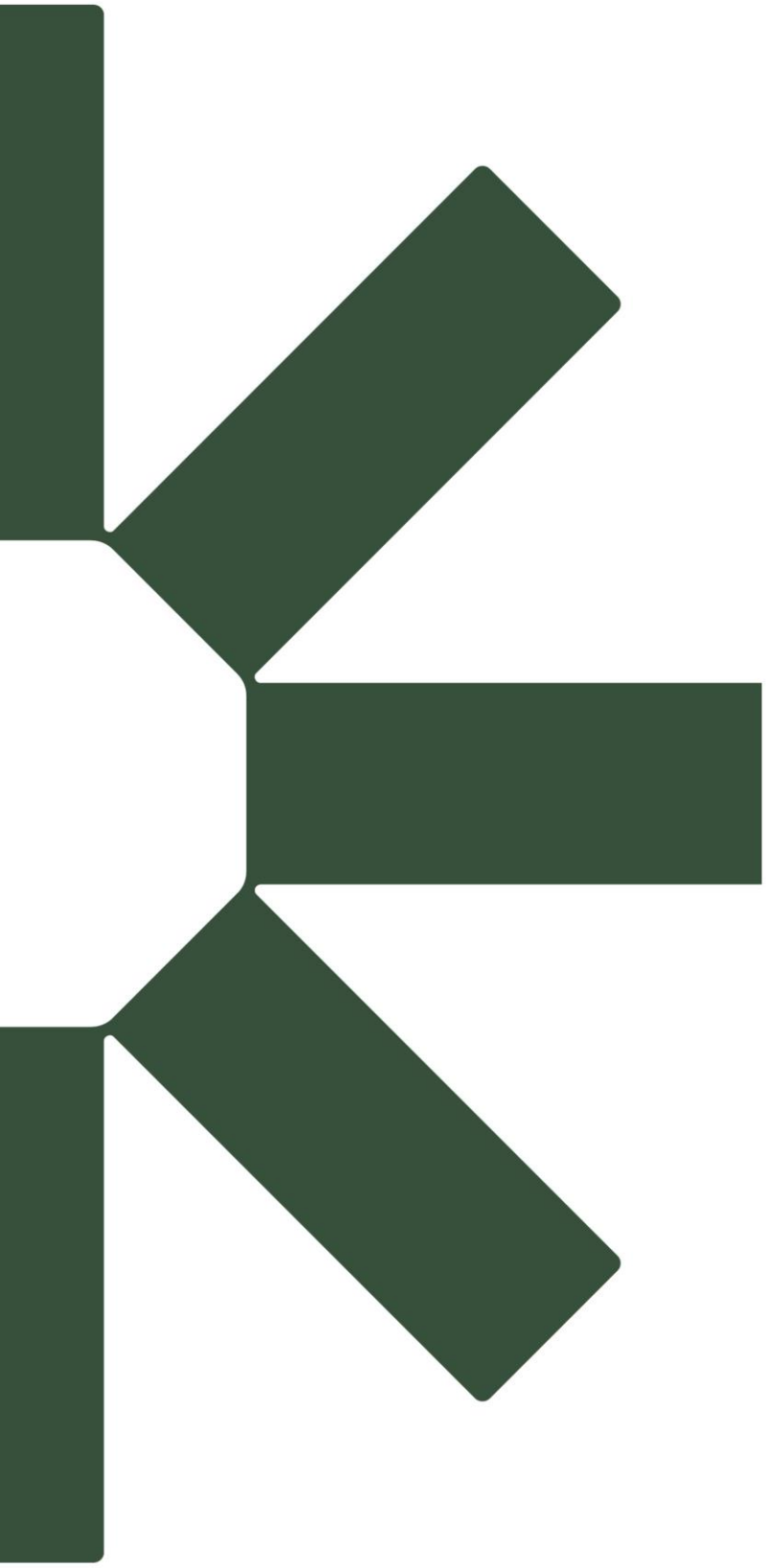
Muingmore Wind Farm

Habitat Management Plan

RWE

SLR Project No.: 501.065301.00001

28 November 2025



Making Sustainability Happen

474000 476000 478000

824000 822000

N

Doolough

Tristia

Gweesalia

Kilometres 0 1 2

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13

1 2 3

TCC1

1 PB3; 2 GS4/GS3; 3 GS4/PF2/HH3; 4 FW1; 5 WD4; 6 WD4; 7 WD4; 8 GS4; 9 GS4; 10 GS4; 11 WS1/GS4; 12 FW1; 13 ED3; 14 ED3; 15 ED3; 16 ED3; 17 BL3; 18 HD1/WS1/GS4; 19 GS4; 20 PB3; 21 WD4; 22 WD4; 23 PF3; 24 GS4; 25 PB3; 26 GS4/HH3/WS1; 27 FL2; 28 PB4; 29 GS4/WS1/HD1; 30 WS1; 31 FL8; 32 PB3; 33 GS4/ED3/WS1; 34 WS1; 35 GS4; 36 GS4; 37 PB4; 38 PB4; 39 PB4; 40 PB4; 41 PB4; 42 PB4; 43 PB4; 44 PB4; 45 PB4; 46 PB4; 47 PB4; 48 WS1; 49 WS1; 50 PB4/WS1; 51 PB4/WS1; 52 PB4/WS1; 53 PB4/WS1; 54 PB4/WS1; 55 FL2; 56 GS3; 57 BL3; 58 WS1; 59 FS1; 60 FL8; 61 FS1; 62 PF3; 63 FS1; 64 FS1; 65 FS1; 66 PB4/WS1; 67 WD4

LEGEND

- Proposed Development Site Boundary
- Proposed Turbine Location
- Proposed Site Access Location
- Proposed Met Mast Location
- Proposed New Access Track
- Proposed Upgraded Access Track
- Proposed Grid Connection Route (Subject to Separate Planning Application)
- Proposed Crane Pad
- Proposed Substation
- Proposed Battery Energy Storage System (BESS) Compound
- Proposed Attenuation Basin

Fossit Habitats (Linear)

- BL3 - Buildings and Artificial Surfaces
- ED3 - Recolonising Bare Ground
- FW1 - Eroding / Upland Rivers

Fossit Habitats (Areas)

- BL3 - Buildings and Artificial Surfaces
- FL2 - Acid Oligotrophic Lake
- FL8 - Other Artifical Lakes and Ponds
- FS1 - Reed and Large Sedge Swamps
- FW1 - Eroding/Upland Rivers
- GS3 - Dry-humid Acid Grassland
- GS4 - Wet Grassland
- GS4/ED3/WS1 - Wet Grassland / Recolonising Bareground / Scrub
- GS4/GS3 - Wet Grassland / Dry-humid Acid Grassland
- GS4/HH3/WS1 - Wet Grassland / Wet Heath / Scrub
- GS4/PF2/HH3 - Wet Grassland / Poor Fen and Flush / Wet Heath
- GS4/WS1 - Wet Grassland / Scrub
- GS4/WS1/HD1 - Wet Grassland / Scrub / Dense Bracken
- HD1/WS1/GS4 - Dense Bracken / Scrub / Wet Grassland
- PB3 - Lowland Blanket Bog
- PB4 - Cutover Bog
- PB4/WS1 - Cutover Bog / Scrub
- PF3 - Transition Mire and Quaking Bog
- WD4 - Conifer Plantation
- WD4/ED3/GS4 - Conifer Plantation / Recolonising Bareground / Wet Grassland
- WS1 - Scrub
- WS1/GS4 - Scrub / Wet Grassland
- WS1/GS4/HH3 - Scrub / Wet Grassland / Wet Heath

RWE

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MUINGMORE WIND FARM

HABITAT MANAGEMENT PLAN

HABITAT FOSSIT PLAN MAIN WIND FARM DEVELOPMENT SITE BOUNDARY

FIGURE 1a

Scale 1:18,000 @ A3

Date APRIL 2026

402.064443.00001.0190.0 Habitat Plan

478000 478250 478500 478750

821750

821500

N

70 WS1

71 PB3

72 PB3

73 WS1

0 50 100

Metres

LEGEND

Proposed Development Site Boundary

Proposed Over-run Area Access Track

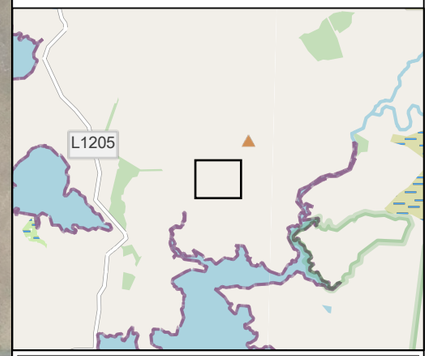
Proposed Turbine Delivery Route (TDR)

Fossitt Habitat Survey Area

Fossit Habitats (Area)

PB3 - Lowland Blanket Bog

WS1 - Scrub



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HABITAT MANAGEMENT PLAN

HABITAT FOSSITT PLAN OVER-RUN AREA 1

FIGURE 1b

Scale 1:3,000 @ A3

Date MAY 2026

402.064443.00001.0192.0 Habitat Plan ORA

497500

497750

819750

819500

81 BL3

86 FW4

85 BL3

83 GS2

84 BL3

82

81 BL3

N

0 50 100

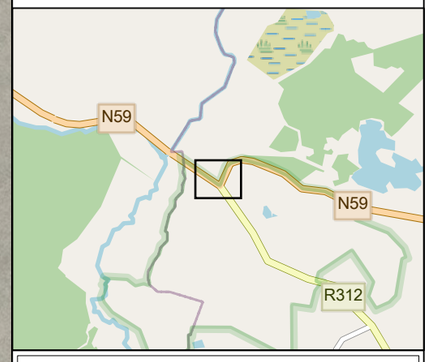
Metres

LEGEND

- Proposed Development Site Boundary
- Proposed Over-run Area Access Track
- Proposed Turbine Delivery Route (TDR)
- Fossitt Habitat Survey Area

Fossit Habitats (Area)

- PB3 / GS2 / WS1- Lowland Blanket Bog / Dry Meadow and Grassy Verge / Scrub
- BL3 - Buildings and Artifical Surfaces
- FW4 - Drainage Ditches
- GS2 - Dry Meadows & Grassy Verges



RWE

SLR

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HABITAT MANAGEMENT PLAN

HABITAT FOSSITT PLAN OVER-RUN AREA 2

FIGURE 1c

Scale 1:2,000 @ A3

Date MAY 2026

402.064443.00001.0192.0 Habitat Plan ORA

474000 475000 476000 477000 478000 479000

824000

823000

822000

N

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13

1 2 3

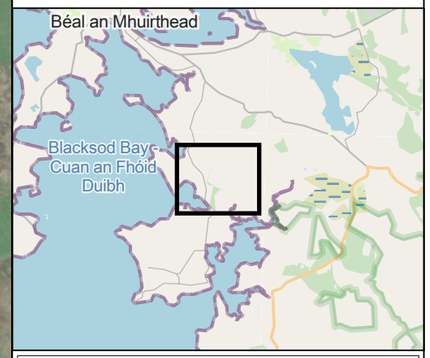
0 0.5 1

Kilometres

LEGEND

- Proposed Development Site Boundary
- Survey Boundary
- Proposed Turbine Location
- Proposed Site Access Location
- Proposed New Access Track
- Proposed Upgraded Access Track
- Proposed Grid Connection Route (Subject to Seperate Planning Application)
- Proposed Crane Pad
- Proposed Substation
- Battery Energy Storage System (BESS) Compound
- Proposed Temporary Construction Compound (TCC)
- Proposed Attenuation Basin
- Combined Infrastructure 30 m Buffer – Rewetting Anticipated to be less Effective due to Infrastructure Drainage Influences
- Ditch Blocking and Infilling
- Watercourse 30 m Buffer - Ditch Blocking Only as Appropriate to Protect the Water Environment
- Ground Smoothing and Bog Creation
- Bog to Forest Transition
- Peat Cuttingface Reprofiling and 30 m Restoration Buffer
- Scrub Clearance
- Gunnera tinctoria
- Rhododendron ponticum

Note:
Vegetation management in keyhole areas around proposed turbines to deter foraging by kestrels.
Three kestrel nest boxes to be installed, locations to be determined.
Over-Run Area 3 is not considered in this assessment.



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MUINGMORE WIND FARM

HABITAT MANAGEMENT PLAN

INTERVENTION LOCATIONS
MAIN WIND FARM DEVELOPMENT SITE BOUNDARY

FIGURE 2a

Scale 1:16,000 @ A3

Date MAY 2026

402.064443.00001.0193.0 HMP

478000
478250
478500
478750
821750
821500
N
LEGEND
Proposed Development Site Boundary
Proposed Over-run Area Access Track
Proposed Turbine Delivery Route (TDR)
L1205
0
50
100
Metres
RWE
SLR
MUINGMORE WIND FARM
HABITAT MANAGEMENT PLAN
INTERVENTION LOCATIONS OVER-RUN AREA 1
FIGURE 2b
Scale 1:3,000 @ A3
Date APRIL 2026
402.064443.00001.0194.0 HMP ORA

497500

497750

819750

819500

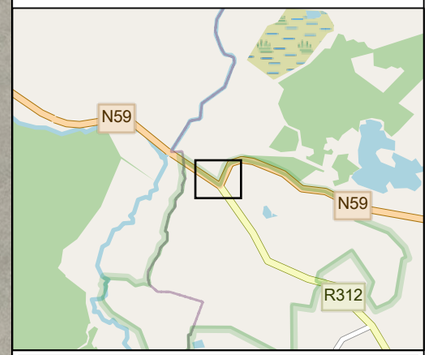
N

LEGEND

Proposed Development Site Boundary

Proposed Over-run Area Access Track

Proposed Turbine Delivery Route (TDR)



0 50 100

Metres

RWE

SLR

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HABITAT MANAGEMENT PLAN

INTERVENTION LOCATIONS OVER-RUN AREA 2

FIGURE 2c

Scale 1:2,000 @ A3

Date APRIL 2026

402.064443.00001.0194.0 HMP ORA

Appendix B Additional Figures

RWE Renewables Ireland Limited

SLR Project No.: 501.065301.00001

27 February 2026

474000 476000 478000

824000 822000

N

Doolough

Tristia

Gweesalia

Kilometres 0 1 2

T1 T2 T3 T4 T5 T6 T7 T8 T9 T10 T11 T12 T13

TCC1

1 2 3

1 PB3; 2 GS4/GS3; 3 GS4/PF2/HH3; 4 FW1; 5 WD4; 6 WD4; 7 WD4; 8 GS4; 9 GS4; 10 GS4; 11 WS1/GS4; 12 PB3; 13 WS1/GS4; 14 PB3; 15 WS1/GS4/HH3; 16 WD4/ED3/GS4; 17 PF3; 18 HD1/WS1/GS4; 19 GS4; 20 PB3; 21 WD4; 22 WD4; 23 PF3; 24 GS4; 25 PB3; 26 GS4/HH3/WS1; 27 FL2; 28 PB4; 29 GS4/WS1/HD1; 30 WS1; 31 FL8; 32 PB3; 33 GS4/ED3/WS1; 34 WS1; 35 GS4; 36 GS4; 37 PB4; 38 PB4; 39 PB4; 40 PB4; 41 PB4; 42 PB4; 43 PB4; 44 PB4; 45 PB4; 46 PB4; 47 PB4; 48 WS1; 49 WS1; 50 PB4/WS1; 51 PB4/WS1; 52 PB4/WS1; 53 PB4/WS1; 54 PB4/WS1; 55 FL2; 56 GS3; 57 BL3; 58 WS1; 59 FS1; 60 FL8; 61 FS1; 62 PF3; 63 FS1; 64 FS1; 65 FS1; 66 PB4/WS1; 67 WD4; 69 BL3; 70 FW1

1 FW1; 2 FW1; 3 FW1; 4 FW1; 5 FW1; 6 FW1; 7 FW1; 8 FW1; 9 FW1; 10 FW1; 11 FW1; 12 FW1; 13 ED3; 14 ED3; 15 ED3; 16 ED3; 17 BL3; 7 BL3; 8 BL3

LEGEND

- Proposed Development Site Boundary
- Proposed Turbine Location
- Proposed Site Access Location
- Proposed Met Mast Location
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- Proposed Upgraded Access Track
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Fossit Habitats (Linear)

- BL3 - Buildings and Artificial Surfaces
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- GS4/HH3/WS1 - Wet Grassland / Wet Heath / Scrub
- GS4/PF2/HH3 - Wet Grassland / Poor Fen and Flush / Wet Heath
- GS4/WS1 - Wet Grassland / Scrub
- GS4/WS1/HD1 - Wet Grassland / Scrub / Dense Bracken
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- WD4/ED3/GS4 - Conifer Plantation / Recolonising Bareground / Wet Grassland
- WS1 - Scrub
- WS1/GS4 - Scrub / Wet Grassland
- WS1/GS4/HH3 - Scrub / Wet Grassland / Wet Heath

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MUINGMORE WIND FARM

PEAT RESTORATION PLAN

HABITAT FOSSIT PLAN
MAIN WIND FARM DEVELOPMENT SITE BOUNDARY

FIGURE 1a

Scale 1:18,000 @ A3

Date APRIL 2026

402.064443.00001.0188.0 Habitat Plan

478000 478250 478500 478750

821750

821500

N

70 WS1

71 PB3

72 PB3

73 WS1

0 50 100

Metres

LEGEND

Proposed Development Site Boundary

Proposed Over-run Area Access Track

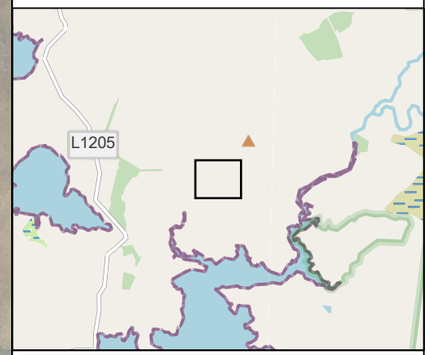
Proposed Turbine Delivery Route (TDR)

Fossitt Habitat Survey Area

Fossit Habitats (Area)

PB3 - Lowland Blanket Bog

WS1 - Scrub



RWE

SLR

MUINGMORE WIND FARM

PEAT RESTORATION PLAN

HABITAT FOSSITT PLAN: OVER-RUN AREA 1

FIGURE 1b

Scale 1:3,000 @ A3

Date MAY 2026

402.064443.00001.0189.0 Habitat Fossitt Map ORA

497500

497750

819750

819500

81 BL3

86 FW4

85 BL3

83 GS2

84 BL3

82

81 BL3

N

0 50 100

Metres

LEGEND

Proposed Development Site Boundary

Proposed Over-run Area Access Track

Proposed Turbine Delivery Route (TDR)

Fossitt Habitat Survey Area

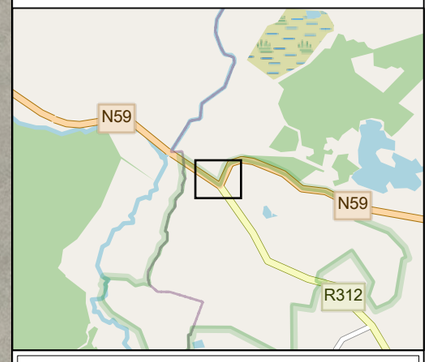
Fossit Habitats (Area)

PB3 / GS2 / WS1- Lowland Blanket Bog / Dry Meadow and Grassy Verge / Scrub

BL3 - Buildings and Artifical Surfaces

FW4 - Drainage Ditches

GS2 - Dry Meadows & Grassy Verges



RWE

SLR

MUINGMORE WIND FARM

PEAT RESTORATION PLAN

HABITAT FOSSITT PLAN: OVER-RUN AREA 2

FIGURE 1c

Scale 1:2,000 @ A3

Date MAY 2026

402.064443.00001.0189.0 Habitat Fossitt Map ORA

485000 485250 485500 485750

823750

823500

N

75
87 GS4
79 FW2
88 GS4
74 PB4
77 PB4
76 BL3
80 GS4
78 PB3
89 WS1

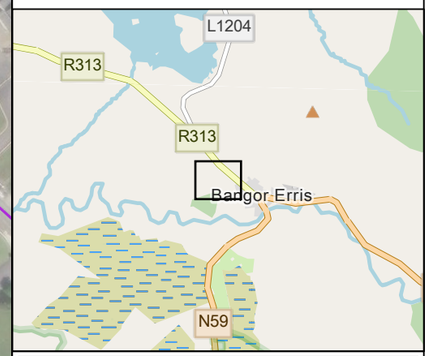
0 50 100
Metres

LEGEND

- Proposed Development Site Boundary
- Proposed Over-run Area Access Track
- Proposed Turbine Delivery Route (TDR)
- Fossitt Habitat Survey Area

Fossit Habitats (Area)

- PB3 / GS2 / WS1- Lowland Blanket Bog / Dry Meadow and Grassy Verge / Scrub
- BL3 - Buildings and Artifical Surfaces
- FW2- Depositing Lowland Rivers
- GS4 - Wet Grassland
- PB3 - Lowland Blanket Bog
- PB4 - Cutover Bog
- WS1 - Scrub



RWE

SLR

MUINGMORE WIND FARM

PEAT RESTORATION PLAN

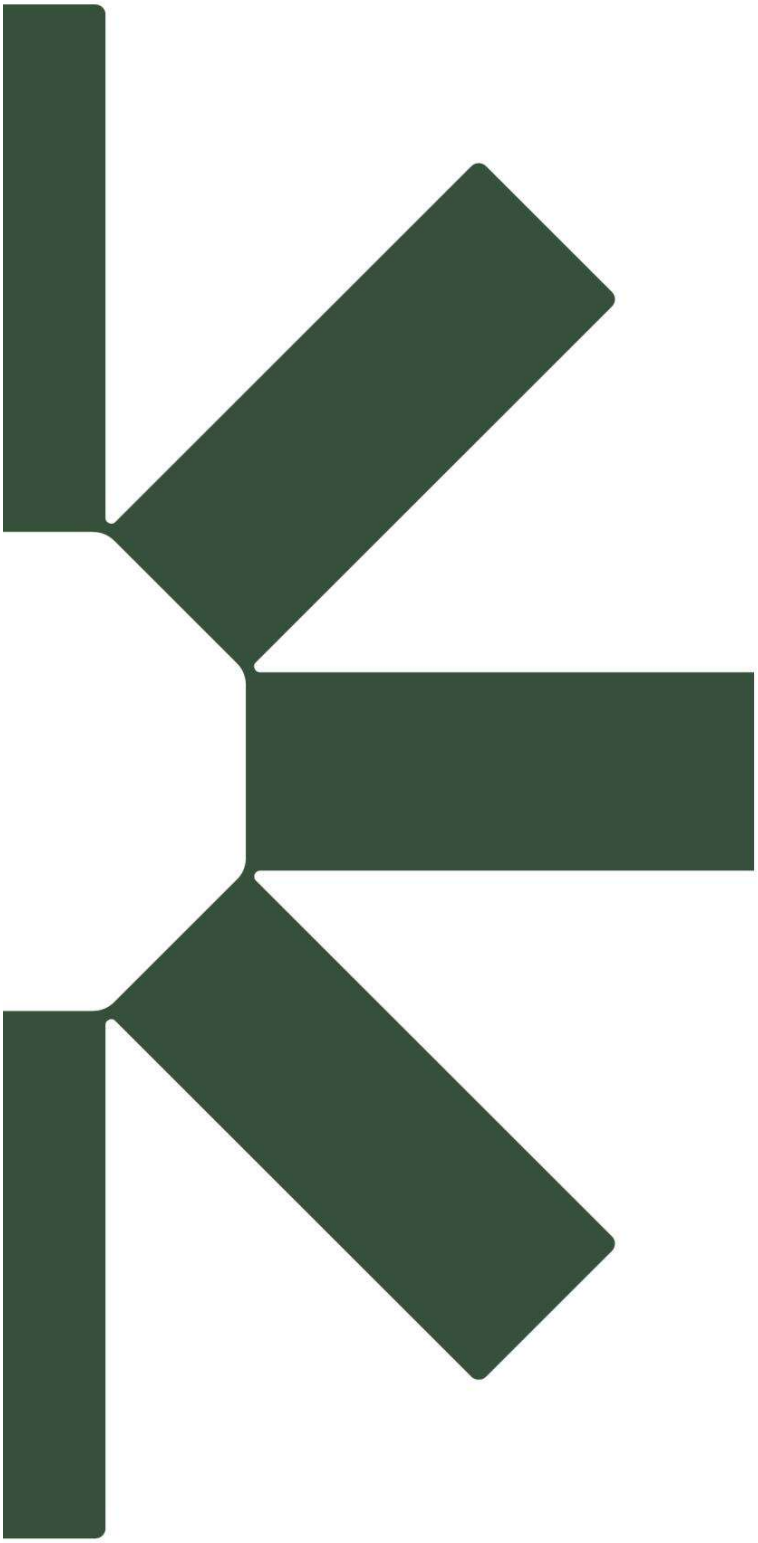
HABITAT FOSSITT PLAN: OVER-RUN AREA 3

FIGURE 1d

Scale 1:2,500 @ A3

Date MAY 2026

402.064443.00001.0189.0 Habitat Fossitt Map ORA



Making Sustainability Happen