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APPENDIX 6-4

BIODIVERSITY MANAGEMENT AND ENHANCEMENT PLAN



DOCUMENT DETAILS

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Planning and
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1. INTRODUCTION

1.1 Background

MKO have prepared this Biodiversity Management and Enhancement Plan (BMEP) to support the Environmental Impact Assessment Report (EIAR) which accompanies the planning application for the Cunlaghfadda Green Energy Project in Co. Mayo (the Proposed Project), which includes 7 no. wind turbines and all associated infrastructure and works. The Proposed Project is located approximately 5.3km northwest of the town of Claremorris, and 16km southeast of the town of Castlebar. The full description of the Proposed Project is detailed in Chapter 4 of the EIAR.

Where the term 'Plan' is used in this document, this refers to the Biodiversity Management and Enhancement Plan.

With biodiversity in global decline, and with due consideration of development policy shifts towards avoidance of biodiversity loss, this Plan has been prepared in respect of the Proposed Project to take the opportunity to provide biodiversity enhancement within the Site. The habitat enhancement and management measures that are included in this document are designed to offset the loss of habitats within the Proposed Project footprint and aim to increase the overall biodiversity value of the site. The objectives of this Plan, set out below, align with the goals of the 4th National Biodiversity Action Plan.

1.1.1 Objectives of the Biodiversity Management and Enhancement Plan

The objectives of this Plan are as follows:

- To set out the required measures to protect existing high value habitats within the Site.
- To provide for the enhancement of an area of degraded Annex I *Molinia* meadow [6410] habitat within the Site.
- To safeguard, maintain and monitor existing marsh fritillary breeding habitat.
- To plant 2,505m of linear vegetation within the Site in order to increase hedgerow and treeline habitat and bolster wildlife corridors.
- To plant 3.5ha of native woodland within the Site in order to increase woodland habitat and bolster wildlife corridors.
- To provide additional foraging and resting/breeding habitat for bat species
- To provide a management and monitoring plan to ensure the success of the proposed measures.

1.2 Statement of Authority

This Plan was prepared by Bea Jackson (B.A., M.Sc.) who has over 2 years' ecological consultancy experience and is a Qualifying Member of CIEEM. Bea has experience working on Biodiversity Management Plans, Invasive Species Management Plans, Appropriate Assessments and Ecological Impact Assessments for public and private sector clients. This report has been reviewed by Sarah Mullen (B.Sc., M.Sc., Ph.D., ACIEEM). Sarah is a Project Director with MKO and has over ten years' experience in ecological consultancy. She holds membership with the Chartered Institute of Ecology and Environmental Management. Appendix 6-6 of the Biodiversity Chapter of the EIAR contains CVs for the project team for Cunlaghfadda Green Energy Project.

2.

ECOLOGICAL BASELINE

Multidisciplinary ecological surveys, comprising multi-disciplinary walkover surveys, botanical surveys, mammal surveys, bat surveys, marsh fritillary surveys and bird surveys were undertaken by MKO between 2023 and 2025 as detailed within the EIAR submitted as part of the application. A high-level overview of habitats and fauna within the Site is provided below.

2.1

Habitats

A detailed account of the habitats, including a habitat map, and associated floral species found within the site is included within the EIAR (Chapter 6) which accompanies this application. The following habitats are present within the Site and associated works areas:

- > Raised bog (PB1)
- > Cutover bog (PB4)
- > Transition mire and quaking bog on Cutover bog (PB4/PF3)
- > Improved agricultural grassland (GA1)
- > Dry meadows and grassy verges (GS2)
- > Dry meadows and grassy verges / Scrub mosaic (GS4/WS1)
- > Wet grassland (GS4)
- > Wet grassland on Cutover bog (PB4/GS4)
- > Mixed broadleaved/conifer woodland (WD2)
- > Mixed conifer woodland (WD3)
- > Conifer plantation (WD4)
- > Hedgerows (WL1)
- > Treelines (WL2)
- > Scrub (WS1)
- > Scrub on Cutover bog (PB4/WS1)
- > Drainage ditches (FW4)
- > Pond (Other)
- > Tilled land (BC3)
- > Stone walls and other stonework (BL1)
- > Buildings and artificial surfaces (BL3)
- > Spoil and bare ground (ED2)
- > Recolonising bare ground (ED3)
- > Eroding/upland river (FW1)

2.1.1

Annex I Habitats

A number of habitats present within the Site were found to correspond to habitats listed under Annex I of the European Habitats Directive. Four areas of wet grassland within the Site were found to correspond to the Annex I habitat *Molinia* meadows [6410]. In addition, an area which was classified as transition mires and quaking bogs (PF3) which was establishing on cutover bog was found to correspond to the Annex I habitat Transition mires [7140]. The area of transition mire habitat is located completely outside of the footprint of the Proposed Project.

The four areas of grassland which corresponded to the Annex I habitat *Molinia* meadows occur within the Site and are located to the southwest of the proposed onsite substation, to the southeast of the proposed Turbine 6, south and east of proposed Turbine 4, and to the north of proposed Turbine 3. The area to the southeast of Turbine 6 which, has deteriorated in quality over the course of the ecological surveys of the Site (between 2023 and 2025), due to the high cover of tussocks of purple moor grass (*Molinia caerulea*), no longer passes the structure and function habitat condition assessment

criteria as defined in Martin *et al.* (2018). This area is proposed for enhancement measures, to improve the habitat condition as described in **Section 3.1** below.

A small area of approximately 0.0293ha of the Annex I habitat *Molinia* meadows [6410] occurs immediately adjacent to the proposed infrastructure footprint (i.e., within 5m of the internal cabling routes for the proposed Turbines 3 and 4, the proposed upgrades to the existing road, and the proposed peat and spoil management area to the south of proposed Turbine 4). Where small areas lie within 5m of the footprint, these areas will be fenced off during the construction phase as part of the prescribed mitigation measures outlined in Chapter 6 of the EIAR which has been prepared for the Proposed Project. This will prevent access of machinery to these areas and potential damage to or loss of the habitat. A further 2.14ha of the Annex I habitat *Molinia* meadows [6410] is present within the Site but lies outside of the footprint of the Proposed Project.

2.1.2 Fauna

A number of protected fauna species were recorded using the Site. Evidence of breeding marsh fritillary (*Euphydryas aurinia*) was found within the Site. A total of 41 larval webs were identified in 2025, primarily as a core population within the area of *Molinia* meadow to the south of Turbine 4 (36 webs), with sparse records also within areas of cutover bog and wet grassland to the north of Turbine 3 (5 webs). Additional areas of suitable habitat for the species were identified to the north of Turbine 4, west of Turbine 3, southwest of Turbine 6 and west of the proposed met mast location, however no larval webs were recorded in these areas. Habitat condition assessments as per NBDC guidelines¹ were also undertaken within each area of suitable habitat. Five habitat parcels were assessed as being in *Good Condition*, a further five habitat parcels were classified as *Suitable (Under-grazed)*, and a single habitat parcel was classified as *Unsuitable*. A map showing larval web records, as well as areas of suitable marsh fritillary habitat, is shown in Confidential Appendix 6-6.

In addition, bat species, badger (*Meles meles*), Irish hare (*Lepus timidus* subsp. *hibernicus*), bird species and smooth newt (*Lissotriton vulgaris*) were also recorded within the Site. Evidence of otter (*Lutra lutra*) was also recorded downstream of the Site within the Meander River and an unnamed tributary which outfalls from the south of Drumady Lough adjacent to the eastern boundary of the Site. No evidence of otter was recorded within the Site.

2.1.3 Invasive species

Japanese knotweed (*Reynoutria japonica*) was recorded during the ecological surveys of the Site. This species is listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) and the First Schedule of the European Union (Invasive Alien Species) Regulations 2024 (S.I. 374 of 2024). Large stands of Japanese knotweed occur frequently throughout the south of the Site and show significant evidence of spread within the Site. This species was recorded within the footprint of the Proposed Project along the L15053 road which is proposed for upgrade as part of the Proposed Project. Japanese knotweed has spread widely through the south of the Site in areas of cutover bog and wet grassland on cutover bog, as described in Chapter 6 Biodiversity of the EIAR.

¹ <https://biodiversityireland.ie/app/uploads/2021/11/Marsh-Fritillary-Larval-Survey-Form.pdf>
<https://biodiversityireland.ie/app/uploads/2021/11/Marsh-Fritillary-Habitat-Condition-Form.pdf>

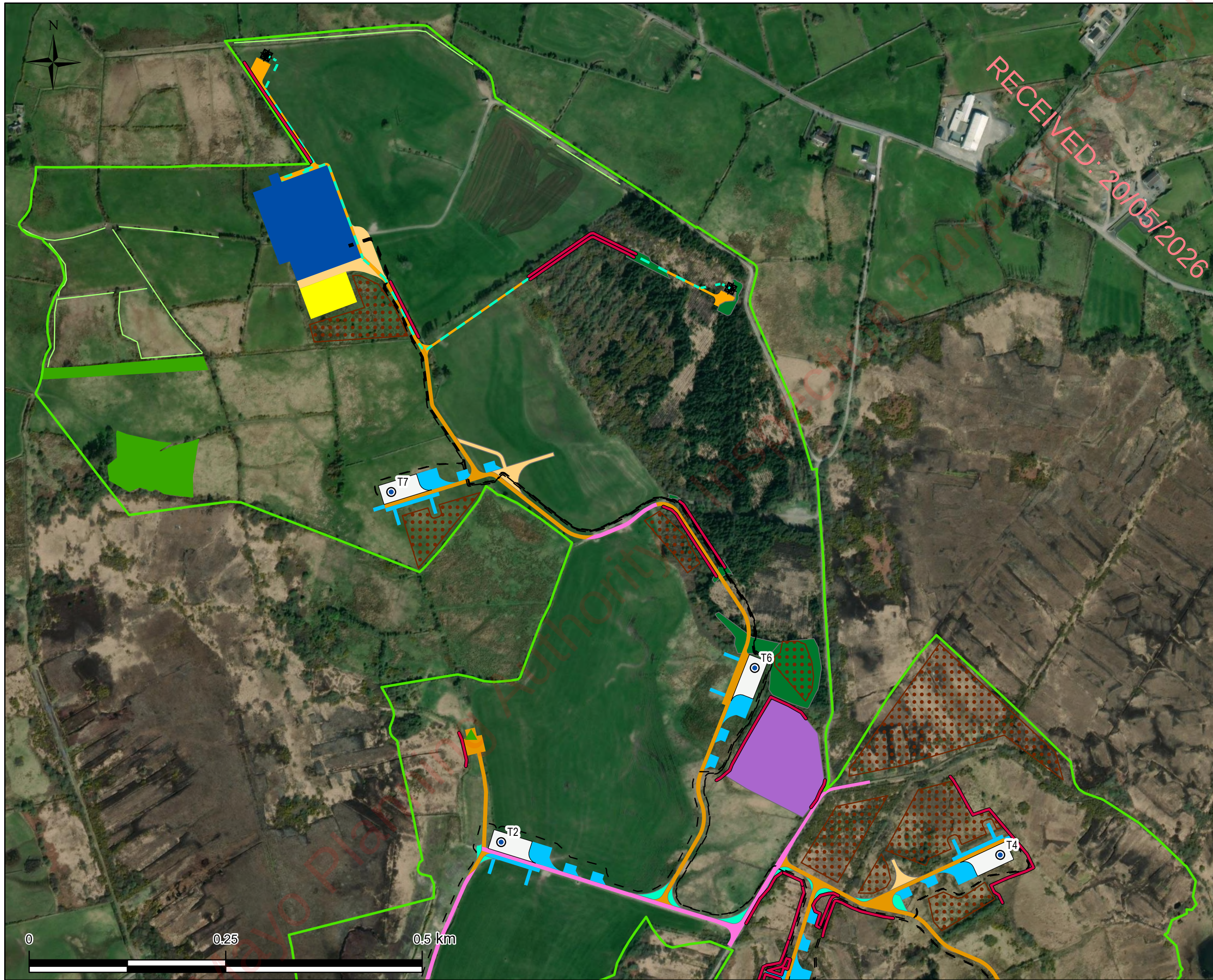
3. PROPOSED PROTECTION AND ENHANCEMENT MEASURES

3.1 *Molinia* Meadow Habitats and suitable Marsh Fritillary Habitat

3.1.1 Habitat Protection - Existing *Molinia* Meadow Habitat and suitable habitat for Marsh Fritillary within the Site

The proposed infrastructure footprint has been designed to entirely avoid *Molinia* meadow habitat and the key area of *Molinia* meadow in which the core breeding population of marsh fritillary butterfly was identified. However, some areas of this habitat are located within 5m of the construction footprint and are therefore at risk of habitat loss due to the potential tracking of vehicles outside the footprint as discussed in Chapter 6 of the EIAR. The Proposed Project will also result in the loss of areas of wet grassland and cutover bog habitat which were identified during the ecological surveys as providing suitable breeding habitat for marsh fritillary (i.e., habitat containing the foodplant devil's bit scabious (*Succisa pratensis*), however no larval webs were recorded in these areas during the ecological surveys of the Site.

In order to prevent habitat loss in the areas of *Molinia* meadow habitat within 5m of the construction footprint due to the encroachment of machinery, temporary fencing will be erected prior to the commencement of construction works. Fencing will be constructed along the margins of the area of *Molinia* meadow south and east of proposed Turbine 4 and its associated hardstand and cabling, continuing both north and south along its margins bordering the proposed peat and spoil management areas. Fencing will also be constructed along the margins of the *Molinia* meadow to the southeast of proposed Turbine 6, where this habitat borders proposed construction works, and along the eastern and western margins of the *Molinia* meadow located to the north of proposed Turbine 3, where the internal cabling route and upgrades to the existing track are proposed. The fencing will contain signage strictly prohibiting entry to these areas. This will denote the area where strictly no machinery, storage of materials or entry of construction site personnel will be permitted. The fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the appointed ecologist on site. The location of the fencing is illustrated in **Figure 3-1a-b**. Further protective mitigation measures for *Molinia* meadows habitat and marsh fritillary and other habitats during construction phase of the Proposed Project are outlined in Chapter 6 of the EIAR.



Map Legend

- ElAR Site Boundary
- Proposed Temporary Construction Fencing
- Proposed Felling
- Proposed Construction Compound

Proposed Wind Farm

- Proposed Turbines
- Proposed Turbine Hardstands
- Temporary Hardstand Areas
- Peat and Spoil Management Areas
- Proposed Internal Cables
- Proposed Met Mast

Proposed Grid Connection

- Proposed 110kV Substation
- Proposed 100kV Grid Connection Cable Route
- Proposed End Masts

Proposed Habitat Enhancement

- Proposed Woodland Planting
- Proposed Linear Planting and Enhancement
- Proposed Marsh Fritillary Enhancement Areas

Proposed Site Roads

- Proposed Upgrade to Existing Access Tracks
- Proposed New Access Tracks
- Temporary Construction Tracks
- Temporary Site Entrance
- Temporary Widening

Spatial Reference
Name: IREN95 Irish Transverse Mercator
Datum: IREN95
Projection: Transverse Mercator

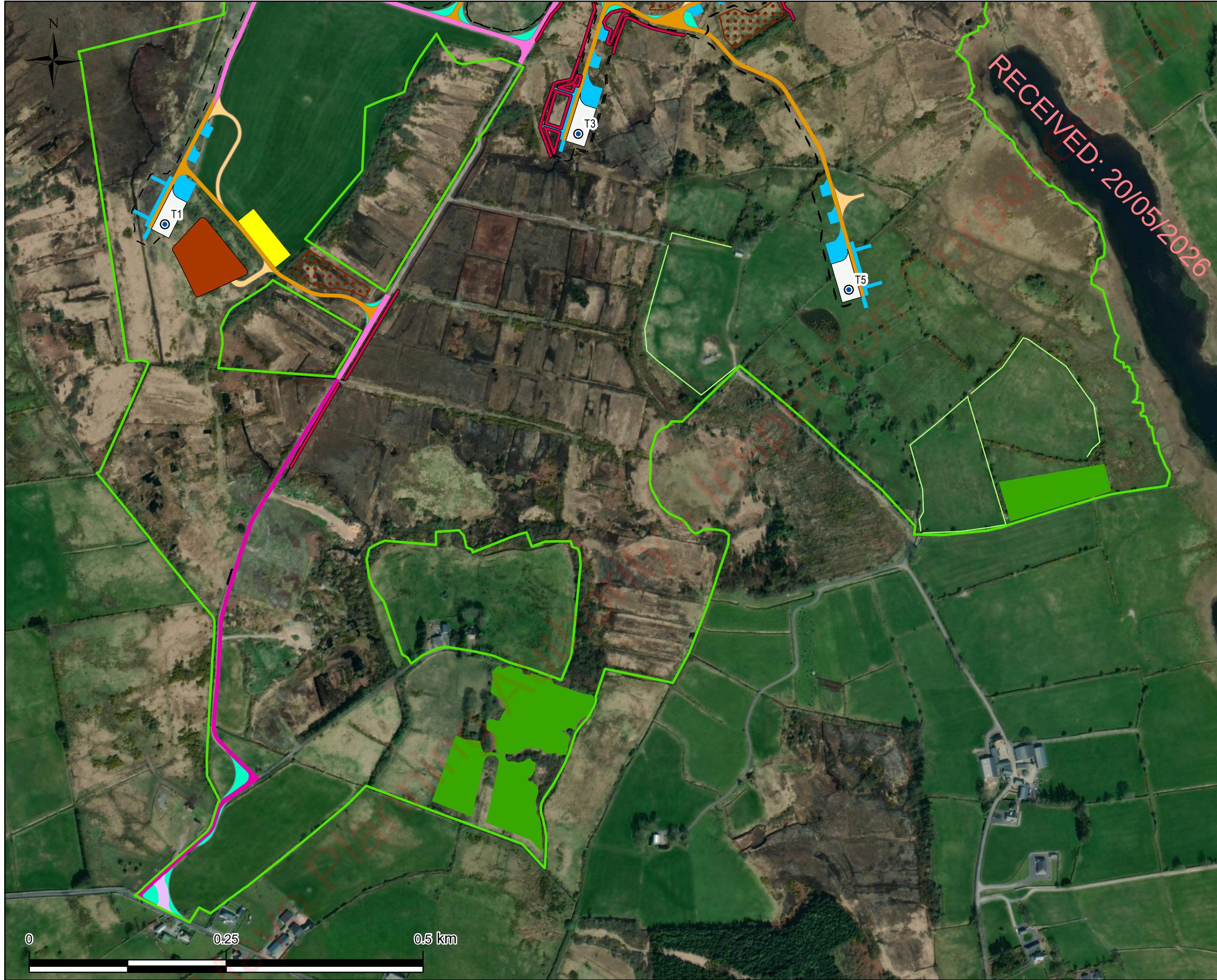
SITE LOCATION - NOT TO SCALE

Drawing Title
Proposed Temporary Fencing Locations North

Project Title
Proposed Cunlaghfadda Green Energy Project

Project No. 220825	Drawing No. 3-1a	Scale 1:4,500
Drawn By MNR	Checked By KB	Date 07/05/2026

Email: info@mkofireland.ie / Website: www.mkofireland.ie



Map Legend

- EIAR Site Boundary
- Proposed Temporary Construction Fencing
- Proposed Construction Compound
- Proposed Wind Farm**
 - Proposed Turbines
 - Proposed Turbine Hardstands
 - Temporary Hardstand Areas
 - Proposed Borrow Pit
 - Peat and Spoil Management Areas
 - Proposed Internal Cables
- Proposed Habitat Enhancement**
 - Proposed Woodland Planting
 - Proposed Linear Planting and Enhancement
- Proposed Site Roads**
 - Proposed Upgrade to Existing Access Tracks
 - Proposed New Access Tracks
 - Proposed Upgrade to Public Road
 - Temporary Construction Tracks
 - Temporary Site Entrance
 - Temporary Widening
 - Passing Bay

Spatial Reference
Name: IREN95 Irish Transverse Mercator
Datum: IREN95
Projection: Transverse Mercator

SITE LOCATION - NOT TO SCALE

Drawing Title
Proposed Temporary Fencing Locations South

Project Title
Proposed Cunlaghfadda Green Energy Project

Project No. 220825	Drawing No. 3-1b	Scale 1:4,500
Drawn By MNR	Checked By KB	Date 07/05/2026

Email: info@mkofireland.ie / Website: www.mkofireland.ie

3.1.2

Habitat Enhancement - *Molinia* meadows and Suitable Breeding Habitat for Marsh Fritillary

The Proposed Project has been designed such that existing areas of *Molinia* meadow and breeding marsh fritillary habitat have been avoided and retained, as discussed in **Section 3.1.1** above. It is further proposed to enhance the existing area of degraded *Molinia* meadow habitat to the southeast of Turbine 6, comprising 1.16ha. This area is illustrated in **Figure 3-2**. Botanical relevés taken in this area during surveys of the Site carried out in 2023 and 2024 identified that this grassland conformed to the Annex I habitat *Molinia* meadows. However, follow up surveys undertaken in 2025 identified that the area had since become dominated by large tussocks of purple moor grass (*Molinia caerulea*) and was less species rich than during previous surveys. Therefore, it is proposed to manage this area to encourage greater floral species diversity and assist it to revert back to higher quality *Molinia* meadow habitat. These enhancement measures will also serve to create an additional area of suitable breeding habitat, in *Good Condition* as per NBDC guidelines, for marsh fritillary butterfly¹. This area lies within 300 metres of the area of confirmed breeding habitat for marsh fritillary and will therefore create additional 'stepping stone' habitat which is key for the survival of the meta populations of the species and to increase its distribution across the landscape.

3.1.2.1

Management

It is proposed to implement a suitable management regime in the *Molinia* meadows/marsh fritillary enhancement areas via grazing. The aim will be to create an uneven patchwork of short and long vegetation by the end of the grazing period. The habitat enhancement measures will commence at the start of the operational stage to reduce disturbance to livestock from construction and to avoid any potential access issues. On a broader scale, the aim is to create a connected network of grasslands suitable for marsh fritillary within the Site. The following management measures are proposed:

- Sheep grazing is unsuitable for habitat enhancement as they avoid grazing of *Molinia* and will graze selectively for flowers. Grazing by traditional breeds² of cattle or horses, or donkeys are more commonly used for habitat enhancement purposes, as they are less selective grazers than sheep. The vegetation structure created by the grazing of cattle is the most suitable to the enhancement of habitat for marsh fritillary butterfly, as their grazing behaviour leaves both tufts of ungrazed vegetation and short grazed areas (Byrne and Moran, 2018; Initiative for Nature, Conservation Cymru, 2021; Martin *et al.*, 2023; Northern Ireland Environment Agency, 2020; Phelan *et al.*, 2021).
- A low stocking level of 0.2-0.4 Livestock Units/ha is recommended³. However, the stocking rate is to be subject to monitoring and altered as required. The goal is to have a structured sward between 12 and 25cm in height.
- An additional area within the same field within the Site comprising 2.03ha of wet grassland habitat to the south of the habitat enhancement area will also be available for grazing to avoid issues with overstocking the area for habitat enhancement.
- Supplementary feeding (if required), and water trough placement is to be provided only on the additional area of wet grassland to the south of the habitat enhancement area to prevent excessive poaching and nutrient enhancement within the area of *Molinia* meadow to be enhanced.

² Ireland has nine native traditional breeds recognised by the Department of Agriculture, Food and the Marine (DAFM): the Connemara pony, Kerry bog pony, Irish Draught horse, Galway sheep, Old Irish Goat, and the cattle breeds Kerry, Dexter, Droimeann and Irish Moiled cattle.

³ Irish Native Rare Breed Society: Conservation Grazing Stocking Rates and Timing. Accessed at: <https://inrbs.ie/conservation-grazing-stocking-rates-and-timing/>

- Due to the wet nature of the Site, grazing should be limited to spring and summer. This can be revised if necessary following the monitoring of the management measure proposed.
- Mowing will be avoided in this area, unless recommended following monitoring of the proposed management regime. Mowing can be utilised as a once-off option for rehabilitation of overgrown areas but is not a viable long-term management option as it removes variations in sward height required to create a suitable habitat structure for marsh fritillary butterfly (Phelan *et al.*, 2021).
- No fertiliser, slurry or pesticide usage will be permitted in the habitat enhancement area. Herbicide use will be avoided, unless required as part of invasive species management.
- No reseedling with perennial rye grass will be permitted in the habitat enhancement area.
- Field operations such as rush or scrub control should only be carried out November to February when caterpillars are in hibernation and less subject to disturbance, and outside of bird nesting season.

3.1.2.2 Monitoring

A site-specific monitoring and evaluation programme is necessary to ensure that the success of the proposed measures remains long-term. It will also assist in situations where the habitat enhancement measures may not have been successful by providing evidence of shortcomings, allowing a revised management plan to be formulated.

Adaptive management measures will be targeted to address specific issues identified by the ecological monitoring and may be varied. The proposed management actions will be conveyed to each of the landowners and management alterations implemented by the wind farm operator as required to achieve the targets of the management plan. Measures may include:

- Alterations to stocking densities, and/or timing of grazing.
- Removal of scrub in areas of excessive scrub encroachment.
- Propagation of devil's bit scabious plant through seed collection or green hay strewing from areas where the plant is present on the Site to establish more plants throughout the Site if required. Seed collection will be undertaken outside of areas with marsh fritillary larval webs present.

A check list of conditions will be assessed by the appointed ecologist as part of the habitat enhancement monitoring. A series of permanent monitoring plots will be established prior to the commencement of the proposed management regime (i.e. during pre-commencement) and relevés will be undertaken in these throughout the proposed monitoring period. Monitoring should be carried out in late August or early September when devil's bit scabious is in flower, and larval webs of the marsh fritillary butterfly are most conspicuous. Conditions assessed will be in reference to the monitoring criteria set out in Martin *et al.* (2018) for the Annex I habitat *Molinia* meadows, and the habitat condition assessment criteria set out by NBDC for marsh fritillary¹ and will include as a minimum:

- Information on vegetation composition i.e. percentage cover of high quality and positive indicator species, percentage cover of negative indicator species, non-native invasive species, scrub species and bracken present.
- Information on vegetation structure i.e. vegetation height, presence of structured vegetation, forb to graminoid ratio.
- Information on physical structure i.e. cover of bare ground, presence of invading scrub, degree of poaching or evidence of excessive disturbance by livestock.
- Information on the presence and abundance of the devil's bit scabious plant
- Information on the presence/absence, and number of occupied larval webs of the marsh fritillary butterfly.

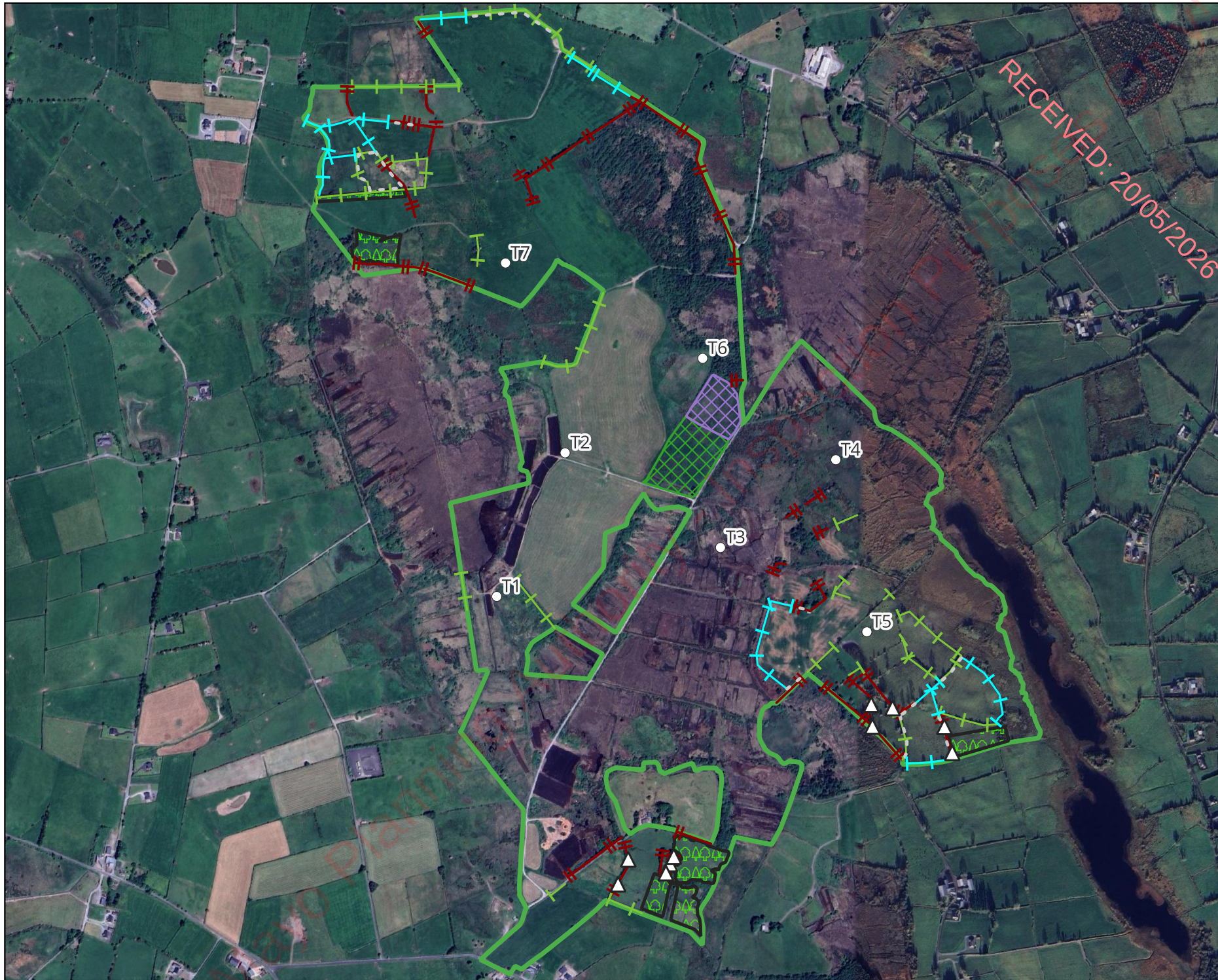
Monitoring surveys will also include presence/absence surveys for marsh fritillary within areas that larval webs were identified during the baseline surveys (i.e. those described in Confidential Appendix 6-6). These will be carried out in accordance with best practice guidance (NRA, 2009) and the National Biodiversity Data Centre Marsh Fritillary survey methodologies for larval web surveys¹. The optimum survey period for larvae is during August and September, in sunny conditions. Occupied larval webs will be recorded.

Monitoring will be carried out on a yearly basis until the proposed grassland enhancement area has been sufficiently established and has given consistent results for 3 consecutive years after the establishment phase. Once the grassland has been successfully established, monitoring can be carried out every other year (years 5, 7, 10, 15 and 20 post-establishment). During this time the appointed ecologist will ascertain whether the methodology needs to be adapted.

Monitoring results will be reported by the appointed ecologist within a Monitoring Report. Any criteria failures will be identified, and corrective actions will be implemented. Reports detailing the monitoring works carried out, the results obtained and a review of their success, along with any suggestions for amendments to the Plan will be prepared.

The results of all monitoring will be made available to the NPWS.

The Plan will be regularly updated and amended where necessary to improve the efficacy of the prescribed works.



Map Legend

- Proposed bat box locations
- Marsh Fritillary and Molinia Meadow Enhancement
- Additional Grazing Area
- Woodland Planting
- Linear Habitat Enhancement**
 - Linear Habitat Bolstering
 - Hedgerow/Treeline Planting
- Linear Habitats Retained**
 - Hedgerows (WL1)
 - Treelines (WL2)
- Proposed Turbine Locations
- EIR Site Boundary



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Drawing Title

Biodiversity Management and Enhancement

Project Title
Cunlaghfadda Green Energy Project

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BJ	SM
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220825-b	Figure 3-2
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3.2 Hedgerows and Treelines

3.2.1 Protection of Existing Hedgerows and Treelines within the Site

The total loss of linear habitats during the construction phase is 1,674m, comprising 720m of treeline and 954m of hedgerow habitat. This includes an additional length of 119m of hedgerows and 299m of treelines within but outside of the 5m buffer of the proposed infrastructure footprint. This is considered a reasonable realistic footprint to allow for tracking of vehicles outside the footprint as drawn, in the absence of mitigation. This includes an area of mature treeline to the north of the proposed onsite substation, and a gappy treeline to the south of the substation. In this location the trees are generally semi-mature in nature with a species mix dominated by hawthorn (*Crataegus monogyna*) and blackthorn (*Prunus spinosa*). In order to reduce the area of additional treeline loss within the Site, temporary fencing will be constructed prior to the construction phase of the Proposed Project along treelines located approximately 4m to the east of the proposed new access track to the substation, and approximately 3m to the west of the access track to the end mast in the north of the Site. This will result in the protection of 209m of additional treelines which are not located within the construction footprint but are located within a 5m buffer of the construction footprint, specifically, mature treelines in the vicinity of the proposed onsite substation. Proposed fencing is illustrated in **Figure 3-1**. No machinery will be permitted to access the fenced off areas. The fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the appointed ecologist on site.

3.2.2 Planting of Hedgerows and Treelines

It is proposed to plant approximately 2,500m of new and bolstered hedgerow and treeline habitat within the Site. The hedgerow planting areas are depicted on **Figure 3-2** and have been strategically chosen to link up existing areas of bat activity.

Species found in the hedgerow habitats within the Site are predominantly hawthorn (*Crataegus monogyna*), European gorse (*Ulex europaeus*), holly (*Ilex aquifolium*), grey willow (*Salix cinerea*), bramble (*Rubus fruticosus* agg.), common ivy (*Hedera helix*). Species found in the treeline habitats are predominantly hawthorn, ash (*Fraxinus excelsior*), blackthorn (*Prunus spinosa*) and beech (*Fagus sylvatica*).

Species selected will be indigenous to the local area. The ideal native hedge is made up of approx. 75% hawthorn and 25% of at least four other species (NBDC, 2022). When planting new hedgerows, plants will be closely spaced (a maximum of 50cm apart) and planted in a staggered row. The new hedgerow will need to be protected from poaching by livestock, through the erection of new stockproof fencing where required, which should be at least 1m away from the hedge, and on each side if required.

The following measures will be followed when planting trees:

- All planting will be done by hand and will be undertaken by a suitably qualified arborist.
- Planting will be undertaken in the dormant season, between November and March or in advance of phase 1 of construction works in order to minimise the interim time necessary for growth and establishment of new habitat.
- Hedgerow will be pit planted, in areas of clear vegetation. This involves using a spade to dig a hole with roots placed in the centre. Soil is then placed around the hedgerow and firmed in, ensuring the tree is upright.
- Newly planted and bolstered hedgerows will be fenced to protect against livestock.

In the north of the Site, bolstering of an existing treeline is proposed to the west of the area of Annex I *Molinia* meadow. In order to avoid tracking or excessive trampling through the *Molinia* meadow habitat, tree planting activities undertaken in this area will be accessed and conducted from the western

side of the treeline, through the improved wet grassland in that area, wherever possible. If required to be accessed from the east, no vehicles or machinery will be permitted to drive through the area of Molinia meadow, with works and transport being undertaken on foot, and with the appointed ecologist present.

3.2.3 Hedgerow Management

- Hedgerows are to be trimmed on a 3 to 5-year rotation to maximise structural diversity and to prevent over-trimming,
- Hedgerows are to reach approx. 2.5m height with an 'A' shape,
- Hedgerow cutting is to be carried out between November and January. This will avoid the bird nesting season (March 1st to August 31st) and will avoid impacts on foraging pollinators,
- It is expected that ivy will self-colonise, and this will be retained where possible,
- Grassy margins will be retained to preserve flowering ground flora and pollinator foraging habitat,
- The use of fertilisers, slurry, herbicides and pesticides will be avoided, in line with NBDC guidance on the management of wind farms for pollinators (NBDC, 2022).

3.2.4 Monitoring of Hedgerow Establishment

Newly planted hedgerows and planted trees will be inspected by the appointed ecologist following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any trees are dead or damaged these will be replaced by the wind farm operator using the same species within the next planting season. Recommendations for ongoing or remedial management required will be specified within a Monitoring Report. It will be ensured that the establishment and management measures set out above in **Section 3.2.2** and **Section 0** are adhered to. Any further recommended measures will be outlined in the Monitoring Report.

3.3 Scrub and Native Woodland

3.3.1 Protection of Existing Scrub within the Site

The total loss of scrub habitats during the construction phase is approximately 2.44ha. In order to reduce the area of additional scrub habitat loss within the Site, temporary fencing will be constructed prior to the construction phase of the Proposed Project along the areas of Scrub which border the conifer plantation within the Site in order to avoid machinery tracking within these areas. The location of this fencing is illustrated in **Figure 3-1**. The fencing will be maintained throughout construction and will be checked for integrity at regular intervals by the appointed ecologist on site. No machinery will be permitted to enter the fenced-off areas.

3.3.2 Planting of Native Woodland

It is proposed to plant 3.5ha of native trees within the Site as shown on **Figure 3-2**. Over time these areas will establish into native woodland and scrub. These areas proposed for planting currently comprise of the following habitat types:

- > Improved agricultural grassland (GA1)
- > Wet grassland (GS4)
- > Recolonising bare ground (ED3)

The published Teagasc soil map⁴ for the areas of proposed woodland planting shows that these areas occur on peat soils and areas of mainly basic, deep well drained mineral soils (BminDW).

The Native woodland scheme recommends the establishment of pioneer Birch woodland on areas of highly modified peats and peaty podzols (Scenario 5), and the establishment of Oak-Ash-Hazel woodland on areas of brown earth soils (Scenario 3) (Cross, J.R. & Collins, K.D. 2017). Planting and establishment of woodland within the woodland planting areas will follow the recommendations and specifications of the native woodland scheme.

Areas of proposed planting over peaty soils will be composed of downy birch (*Betula pubescens*), Scot's pine (*Pinus sylvestris*), pedunculate oak (*Quercus robur*) and rowan (*Sorbus aucuparia*). Minor species (i.e. less frequent species) will be comprised of grey willow (*Salix cinerea*) and eared willow (*Salix aurita*) where wetter conditions occur locally within the planting areas. It is not proposed to undertake any drainage to facilitate the planting of the woodlands within the Site, with the species chosen tailored to the prevailing conditions on the Site.

Areas of proposed planting over well drained mineral soils will be composed of pedunculate oak (40%), with downy birch (20%), hazel (*Corylus avellana*) (20%) and hawthorn (5%) scattered throughout. Wild cherry (*Prunus avium*) (5%) will be planted in groups of 5 to 10 trees. Minor species (10%) are to comprise at least three of the following, positioned alongside planned woodland edges and glades: holly (*Ilex aquifolium*), spindle (*Euonymus europaeus*), rowan, crab apple (*Malus sylvestris*) and alder (*Alnus glutinosa*).

Trees will be of native origin and will be of advanced nursery stock where possible to allow for a varied age structure within the area of woodland to be created. The areas for planting have been strategically chosen to link up with identified bat commuting corridors within the Site and will provide enhanced habitat forging area relative to the existing habitats within the Site.

The following measures should be followed when planting trees:

⁴ <https://gis.epa.ie/GetData/Download>

- Planting will be undertaken in the dormant season, between November and March, or in advance of phase 1 of construction works in order to minimise the interim time necessary for growth and establishment of new habitat.
- Mark out the area for planting so it is clear exactly where planting will be established.
- Use thin stakes or sticks to mark the rows or areas of trees to be planted.
- It is recommended that there are 2m spacings between trees. Shelterbelt planting may be applied by planting up two lines of trees as a staggered row.
- Newly planted trees will need to be protected from poaching by livestock, through the installation of new stockproof fencing which should be at least 2m away from the treeline, and on each side if required. Where new trees are being planted along existing conifer plantation fencing on both sides will likely not be possible. In this case, tall tube tree guards may also be required to protect newly planted trees from wild animals such as deer.
- The use of herbicides and pesticides will be avoided, in line with NBDC guidance on the management of wind farms for pollinators (NBDC, 2022).

3.3.3 Native Woodland Management

In order to facilitate the successful establishment of the new trees to be planted within the Site, the following measures are proposed:

- New tree planting will be kept weed and litter free until the new plants are established, particularly from ruderal weeds. Healthy growth will be maintained by allowing the plant to occupy as much of the planting areas as possible to allow them to achieve as close their natural form as possible.
- During spring and autumn maintenance periods all trees and plants will be checked and adjusted/replaced as required, soil firmed, and any dead wood present removed back to healthy tissue and mulch added if required. Where tree guards are no longer required these will be removed to avoid damage to the tree.
- During the first growing season, all standard trees/ semi-mature trees will be watered regularly during any prolonged dry periods during the growing season (i.e. in April, May, June, July and August). During the second growing season the trees will be kept well-watered as often as required, particularly during June, July and August.

3.3.4 Monitoring of Native Woodland Establishment

Newly planted native woodland will be monitored following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any trees are dead or damaged these will be replaced using the same species within the next planting season. Recommendations for ongoing or remedial management required will be specified within a Monitoring Report. It will be ensured that the establishment and management measures set out above in **Section 3.3.2** and **Section 3.3.3** are adhered to. Any further recommended measures will be outlined in the Monitoring Report.

Habitat Enhancements for Bat Species

It is proposed to erect five bat boxes within the Site to off-set the loss of potential roosting features within the Site, and an additional five bat boxes will be erected to enhance the overall roosting habitat available at the Site.

While there will be no loss of any confirmed roosts within the Site a small number of trees at the location of the proposed substation were found to support Potential Roost Features (PRFs). No evidence of roosting bats was identified within these trees. Nonetheless it is acknowledged that tree roosts are transient in nature and there is potential for bats to utilise these trees from time to time. As outlined in Section 6.5.2.2.3 of the EIAR, pre-commencement bat surveys will be undertaken before any works on Site commence to establish whether bats are present within these trees. There are five bat boxes to be erected in order to off-set the loss of potential roosting features and help to enhance the overall roosting habitat available at the Site in low-risk zones. An additional five bat boxes are proposed to enhance the overall roosting habitat available at the Proposed Project site in low-risk zones.

Bat boxes will be erected on mature trees within the south of site to provide additional roosting opportunities for bat species. The bat boxes will be erected in the indicative locations illustrated in **Figure 3-2**. Boxes will include a mix of crevice-type and cavity-type designs (e.g., Schwegler 1FF and Schwegler 2FN/Wildcare Eco Cavity Bat Box), installed at at least 3 m above ground level, with a southerly orientation and away from artificial lighting, with a clear flight path maintained to box entrances. Bat box installation will be agreed with the appointed ecologist and carried out in accordance with best practice guidance – at least 3m high on mature trees, within existing woodland or treelines and hedgerows, away from artificial lighting and other potential sources of disturbance (Collins, 2023; Kelleher *et al.*, 2022). Bat boxes will not be placed within the turbine risk area to avoid encouraging bats to roost or forage within rotor-swept zones. All placements will be at the edges of the wind farm or near existing linear features leading away from turbines. The bat boxes will be installed in advance of, or during, the construction phase.

The woodland, treeline and hedgerow planting and bolstering outlined in **Section 3.2** and **Section 3.3** above will also enhance existing foraging and commuting habitats for bats, improve habitat connectivity across the Site and will result in a net gain of suitable foraging and commuting habitats.

Monitoring

Monitoring and maintenance of the bat boxes will take place yearly for the first three years of the operational Wind Farm, and will occur again at year five and every 3-5 years thereafter to ensure continued maintenance where required. The results of the first three years of monitoring will inform the need for and frequency of further monitoring and maintenance of the bat boxes, to be reviewed by the appointed ecologist and agreed with the wind farm operator.

Biosecurity

Japanese knotweed was recorded within the Site and an Invasive Species Management Plan was prepared for the Proposed Project (see Appendix 6-5 of Chapter 6 Biodiversity of the EIAR). Japanese knotweed identified within the construction footprint will be chemically treated in advance of the construction phase commencing to prevent future spread during this phase of the development. The applicant has also committed to chemically treat identified areas outside of the construction footprint to prevent future spread throughout the Site. All biodiversity enhancement and protection measures listed in **Sections 3.1 to 3.3** above will be undertaken in compliance with the invasive species management measures outlined in Appendix 6-5. .

Measures to avoid the potential for disturbance and spread of invasive species within the Site, into the Site and off the Site include, but are not limited to:

- A pre-commencement survey for invasive species within the footprint of the Proposed Project will be carried out by a suitably qualified ecologist to map the extent of the growth of Japanese knotweed since the baseline ecological surveys were last undertaken (i.e., since 2025).
- All Japanese knotweed stands and their buffer zones (extending 10 m around stands adjacent to works) will be clearly marked using temporary fencing to prevent disturbance of potentially contaminated areas.
- A bio-secure clean-down area will be designated for machinery and personnel prior to works commencing. This area will be underlain with an impermeable membrane to prevent contamination and will include boot washes and tracking surfaces (e.g., plywood) for machinery exit.
- Machinery entering the site will be pre-cleaned to prevent introduction of rhizome fragments from other locations. On-site clean-down will involve brushing and air-blasting; power washing will only be used where necessary to avoid contaminated run-off.
- A Toolbox Talk will be given by the Environmental Clerk of Works (EnCoW) or Ecological Clerk of Works (ECoW) in relation to the management of invasive species within construction areas.
- All contractor method statements will incorporate the measures outlined in the invasive species management plan.
- Any material or soil imported to the site will be screened for invasive species by a qualified ecologist
- No contaminated soil is to be removed from the site of Proposed Project. Should potentially First or Third Schedule contaminated soil be required to be removed from the Site, it will be transported under license from NPWS to a suitably licenced waste facility.
- Any construction material imported into the Site will come from a source confirmed to be free of invasive species.
- All plant and machinery will be thoroughly cleaned at the designated wheel wash area before entering and exiting the Site. This includes vehicles entering and exiting the woodland replanting areas in the southeast of the Site, due to the presence of Japanese knotweed along the access track in this area.

4.

CONCLUSION

This Plan sets out the measures to be implemented to ensure that the Proposed Project will result in an enhancement in existing habitats on site and a net gain in biodiversity, specifically with regard to *Molinia* meadows habitat, suitable breeding marsh fritillary habitat, hedgerow habitat and woodland habitat, and foraging, commuting and resting/breeding habitat for bat species.

This Plan has set out measures to be implemented during the pre-construction, construction and operational phases of the Proposed Project to ensure that the measures are successful, as well as regular monitoring and reporting by the appointed ecologist to ensure the success of the prescribed measures.

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