



APPENDIX 6-4

BIODIVERSITY MANAGEMENT AND ENHANCEMENT PLAN

Biodiversity Management and Enhancement Plan

Maughanaclea Renewable
Energy Development, Co,
Cork



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1. INTRODUCTION

1.1 Background

This Biodiversity Management and Enhancement Plan (BMEP) has been prepared by MKO in support of the Environmental Impact Assessment Report (EIAR) produced to accompany a planning application for the Proposed Project.

This BMEP has been prepared to outline the proposed biodiversity enhancement measures associated with the Maughanaclea Renewable Energy Development in County Cork (the Proposed Project), which includes 14 no. turbines and all associated infrastructure and works including the proposed 110kV onsite substation and 110kV underground cabling connection to the existing Dunmanway 110kV substation. This BMEP also outlines how the Proposed Project has been designed to offset any loss of habitat or loss of faunal supporting habitat.

With biodiversity in global decline, and with due consideration of development policy shifts towards avoidance of biodiversity net loss. This BMEP has been prepared in respect of the Proposed Wind Farm to take the opportunity to provide biodiversity enhancement within the Proposed Wind Farm site. The objectives of this BMEP, set out below, align with the goals of the 4th National Biodiversity Action Plan.

1.2 Objectives of the BMEP

The objectives of this BMEP are as follows:

- To provide biodiversity enhancement within the Proposed Wind Farm site, by managing areas specifically for Kerry slug, heath habitats and woodland.
- To provide enhanced peatland habitat within the Proposed Wind Farm site
- Planting of 0.54ha of native woodland to create nesting and foraging habitat and enhance structural and species diversity
- To provide a management and monitoring plan to ensure the success of the proposed measures.

1.3 Statement of Authority

This report has been prepared by Julie Kohlstruck and reviewed by Rachel Walsh.

Julie is a Project Ecologist with MKO with 5 years' experience in ecological consultancy. Julie holds a BSc in Landscape Ecology from the University of Muenster, Germany and a MSc in Landscape Ecology from the University of Oldenburg, Germany. **Rachel** (B.Sc. Env, MCIEEM) is a senior ecologist with over 5 years' ecological consultancy experience, having worked on Appropriate Assessments and Ecological Impact Assessments for a range of project types, including renewable energy infrastructure, water services infrastructure and transport infrastructure.

The baseline terrestrial ecological surveys were undertaken by Rachel Minogue (BSc), Matthew Kieran (BSc), Fiona Kileen (BSc), Colin Murphy (BSc, MSc), Tom Peters (BSc, MSc), Ciara Lynn Sheehan (BSc), and Niamh Rowan (BSc) of MKO. Bat Surveys were undertaken by MKO. Details of bat surveyors are provided in **Appendix 6-2 of the EIAR**. Aquatic Surveys were undertaken by MKO. Details of aquatic surveyors are provided in **Appendix 6-3 of the EIAR**.

All surveyors have relevant academic qualifications and are competent in undertaking the habitat and ecological assessments.

2. ECOLOGICAL BASELINE

Multidisciplinary ecological surveys, comprising desk studies, walkover surveys, badger surveys, bat surveys, Kerry Slug surveys and invasive species surveys were undertaken by MKO throughout 2024 and 2025, bird surveys were undertaken by MKO before 2024, 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

Full details on the current ecological baseline of the Site are provided in Section 6.3 of Chapter 6 (Biodiversity) of the EIAR. The following habitats were recorded on the Proposed Wind Farm site:

- Wet Heath (HH3)
- Upland Blanket Bog (PB2)
- Scrub (WS1)
- Hedgerow (WL1)
- Conifer Plantation (WD4)/ Recently Felled Woodland (WS5)
- Improved Agricultural Grassland (GA1)
- Wet Grassland (GS4)
- Improved Agricultural Grassland (GA1)/ Wet Grassland (GS4)
- Dry Humic Acid Grassland (GS3)/ Wet Grassland (GS4)
- Fragmented Dry Siliceous Heath (HH2)
- Dense Bracken (HD1)

2.2 Annex 1 Habitats

The following Annex I habitats were recorded within the Proposed Wind Farm site. High-quality, intact heath and bog habitats within the Proposed Wind Farm site have been deliberately avoided where possible in the design of the Proposed Project:

- Dry Siliceous Heath (HH1)
- Wet Heath (HH3)
- Upland Blanket Bog (PB2)

2.3 Fauna

Hand searches confirmed the presence of Kerry slug at one location within the Proposed Wind Farm site, within an area of **recently felled woodland (WS5)** within the southern turbine cluster of the Proposed Wind Farm site. The species was recorded to the base of a conifer stump. The species has potential to move throughout suitable habitats within the Proposed Wind Farm site.

3. BIODIVERSITY ENHANCEMENT MEASURES

3.1 Overview

Three different types of enhancement areas within the Proposed Wind Farm site have been selected for biodiversity enhancement measures as part of the Proposed Project and to enhance the Proposed Wind Farm site for species and habitats known to occur within the Proposed Wind Farm site. An overview map of the proposed biodiversity enhancement areas is shown in Figure 3-1.

> **Kerry slug enhancement areas**

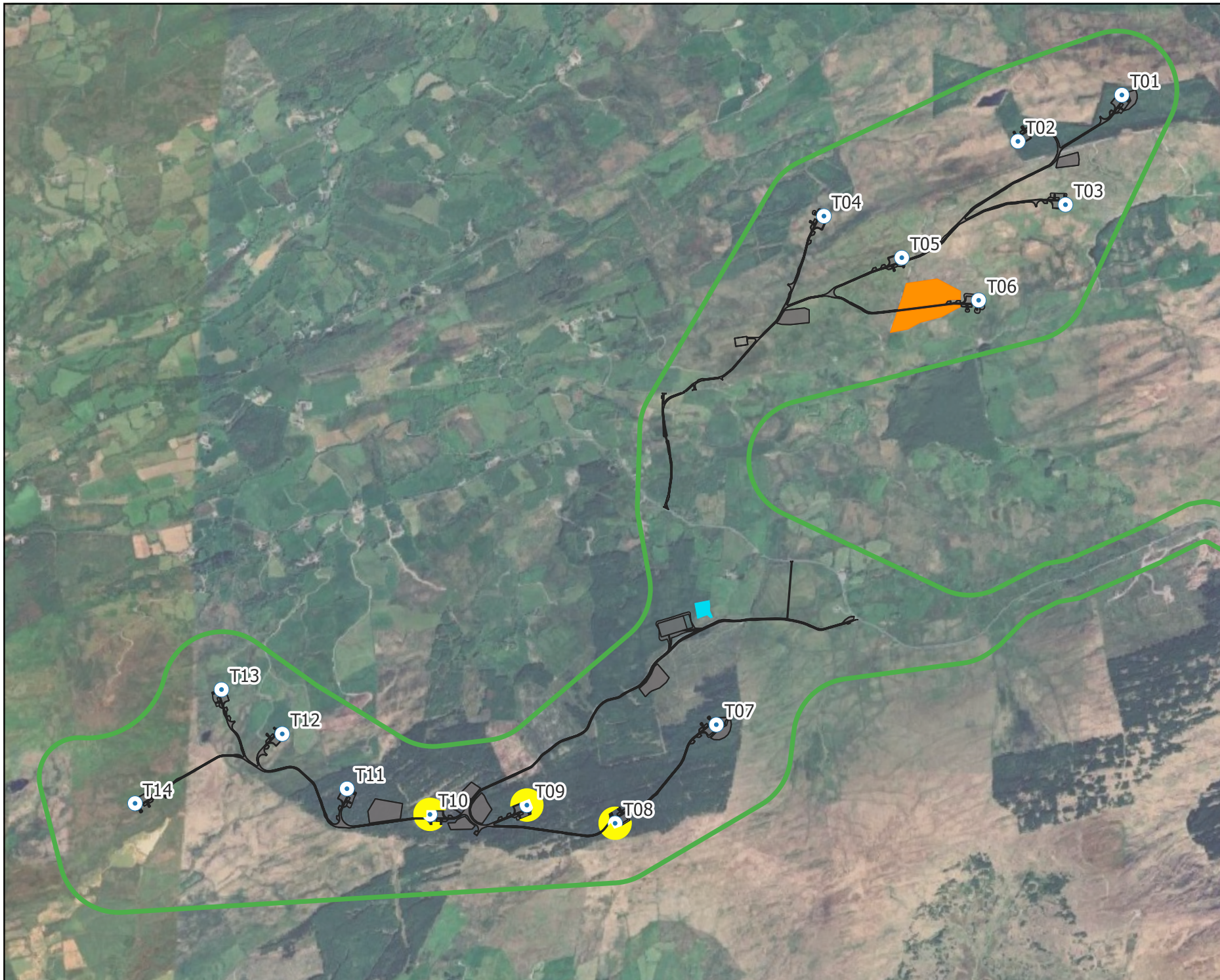
The necessary bat felling buffers for the Proposed Project, as shown in Figure 3-1 will be managed as peat and spoil management areas and to enhance Kerry slug habitat, as this species is known to occur within the Proposed Wind Farm site. Enhancement will include the felling of existing conifer plantations within the 3 no. felling buffers and leaving the stumps in place and to protrude from the additional peat and spoil deposits, as these provide refuge for this species. These areas combined amount to approx. 3.9 ha.

> **Native woodland planting**

As shown in Figure 3-1, 0.54ha of forestry within the Proposed Project will be felled and planted with native woodland. This habitat will connect to a parcel of previously established native woodland and will be located at the boundary of a larger area of conifer plantation. Planting will follow recommendations to establish an oak woodland.


> **Peatland enhancement**

The peatland enhancement area encompasses an area of recently afforested conifer plantation and degraded wet heath habitat. The peatland enhancement area will cover an area of approx. 5.3 ha and is shown in Figure 3-1.



Map Legend

- EIAR Boundary
- Proposed Wind Farm Layout
- Proposed Turbine Locations
- Proposed Biodiversity Management and Enhancement Areas
- Habitat Management for Kerry Slug
- Native Woodland Planting
- Wet Heath Enhancement



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Drawing Title
Proposed Enhancement and Management Areas

Project Title
Maughanaclea Wind Farm

Drawn By MK	Checked By JK
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Project No. 240225	Drawing No. Figure 3-1
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Scale 1:25,000	Date 20/03/2026
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3.2 Kerry Slug Habitat Enhancement

A derogation licence application has been requested from the Department of Housing, Local Government, and Heritage for the disturbance of Kerry slug, which are known to occur within the Proposed Wind Farm site. This licence (DER-KERRY SLUG-2026-07) was issued on the 26/02/2026 and is included in **Appendix 6-6** of the EIAR.

3.2.1 Mitigation Measures

During the construction phase of the Proposed Project, the construction corridor will be kept to a minimum to avoid direct habitat loss for Kerry slug.

Prior to undertaking works in areas of suitable habitat, translocation will be employed to avoid and minimise a direct impact on the species. Translocation to suitable habitat in the surrounding area will be employed to avoid direct loss of individuals.

Monitoring of Kerry Slug in the areas adjacent to the Proposed Wind Farm site works will be undertaken to provide a before and after impact assessment. This will ensure that populations remain stable post-construction.

The following measures will be implemented prior to the commencement of construction:

- Known locations of Kerry Slug identified from the pre-commencement survey efforts will be marked off by an appointed qualified/licenced ecologist. This will help avoid inadvertent encroachment of machinery into known Kerry Slug habitat.
- Pre-commencement surveys in advance of any works will be carried out in areas of suitable Kerry Slug habitat under licence within the Proposed Wind Farm footprint by the qualified/licenced ecologist. These will be carried out on a section-by-section basis as the construction works progress within the Proposed Wind Farm site.
- Kerry Slugs recorded during surveys will be translocated to similar suitable nearby habitat e.g. if found in conifer plantation then moved to adjacent conifer plantation. These sites will be subject to approval by the NPWS as part of their approval process for the translocation licence.

The following mitigation measures will be implemented during construction:

- The extent of the Proposed Wind Farm footprint will be clearly marked to prevent any inadvertent encroachment on Kerry Slug habitat where it is located adjacent to the works areas.
- Where felling is required, tree stumps will be left in place where possible to provide suitable habitat for Kerry Slug. Turves and boulders/ exposed rock will be stored adjacent to the development footprint where practicable before reinstatement to maintain/create suitable habitat for the species in the vicinity of the works during construction. Details of the enhancement are described below.
- Should Kerry Slugs be found in the works areas during the construction phase they will be relocated by the appointed qualified/licenced ecologist to suitable habitat as described below.

3.2.1.1 Enhancement Measures

The proposed Kerry Slug enhancement measures, as indicated in Figure 3-1, include the following:

- Tree stumps resulting from the felling of forestry in the felling buffers for Turbine T08, T09 and T10 will be left in situ to decay to provide suitable habitat for Kerry slug.
- Where the felling areas overlap with Peat and Spoil Management areas (1.44ha of the 3.9ha of Kerry Slug enhancement area) peat will be spread to allow the tree stumps to protrude and larger boulders, if present, can be placed strategically to enhance the foraging area and shelter for Kerry Slug.
- Rock outcrops, boulders and stonewalls will be retained where possible or, if removal can't be avoided, they will be replaced to enhance the value of the habitat surrounding the windfarm infrastructure.
- Monitoring programme (see Section 4)

These measures are proposed within the bat felling buffers around the proposed turbines T08, T09 and T10. Within these buffers, a total of 3.9 ha of conifer plantation will be felled and managed as per above.

3.2.2 Translocation

Prior to undertaking works in areas of suitable habitat, translocation of Kerry Slugs to suitable habitat in the surrounding area will be employed to avoid any direct negative impact on the species.

Translocation will follow the methodology as set out below:

- In advance of any works, areas of exposed rock, and suitable trees within and adjacent to the Proposed Project footprint will be selected by a qualified and licenced ecologist for the promotion and presence of moss and lichen growth and thus provide suitable feeding habitats for Kerry Slug. The selected rocks (if present) will be painted with a mix of yoghurt (to encourage lichen growth), inoculated with lichens, and some mosses found in the vicinity. These areas will be fenced off using post and rope fencing so that the areas will not be disturbed. These selected replacement habitat areas will be monitored (photos taken yearly for three years) during ongoing/all future surveys as part of post construction monitoring. Results will form part of yearly compliance reporting.
- Search, trapping, and translocation will only occur during suitable weather conditions (wet/humid weather).
- The identification of suitable receiving habitat is critical. Animals found on sandstone will be translocated to sandstone, those found on conifer trees will be located to conifer trees, etc.

There is sufficient evidence that such mitigation measures have been successful elsewhere (O’Hanlon et al. 2017) along with record returns (DER/KERRY SLUG – 2018 – 88).

3.3 Native Woodland Planting

It is proposed to plant 0.54ha of native woodland as shown on Figure 3-1. Trees will be of native origin and will be of advanced nursery stock where possible. Planting recommendations follow DAFM Native Tree Area Scheme (2024) and the planting recommendation laid out in the planting recommendations in Native Woodland Information Note No. 6 (2010). The suitable species ratios for the area are listed in Table 3-1.

Table 3-1 Species ratios for native woodland planting.

Species	Size	% of plant mix
Sessile Oak (<i>Quercus petraea</i>)	Bare root (2-3ft)	30%
Birch (<i>Betula pubescens</i>)	Bare root (2-3ft)	30%
Scots pine (<i>Pinus sylvestris</i>)	Bare root (2-3ft)	25%

Holly (<i>Ilex aquifolium</i>)	Bare root (2-3ft)	15%
Rowan (<i>Sorbus aucuparia</i>)		

The following measures will be followed when planting trees and have been informed by ACRES (2024) guidance:

- > 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.
- > When planting trees, tree planting density should be kept sufficiently low to allow
 - establishment of ground story vegetation. Planting small groups of 10 trees with a maximum 2.5m spacing between the trees, and 10m spacing between the groups, is recommended.
- > Trees will be pit planted, in areas of clear vegetation. This involves using a spade to dig a hole
 - with tree roots placed in the centre. Soil is then placed around the tree and firmed in,
 - ensuring the tree is upright.
- > It is recommended that there are 2.5m spacings between trees. Shelterbelt planting may be
 - applied by planting up to two lines of trees as a staggered row.
- > Trees should be planted within a vegetation-free area, at least 1m in diameter.
- > 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.
- > Rabbit, hare, and deer proof tree guards will be placed around each new tree.

3.3.1 Native Woodland Management

In order to facilitate the successful establishment of the new trees to be planted within the Proposed Wind Farm 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.
- > Replanted trees will be inspected 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 the Monitoring Report (see Section 4).

3.4 Peatland Restoration

As part of this BMEP, it is proposed to restore 5.3 ha of peat habitat. The location of the proposed peatland enhancement area is shown in Figure 3-1 and Plate 3-1. The selected area for enhancement was recently planted with Sitka spruce. Peat in this area is shallow (<0.5 m), and the understory between the young trees is dominated by *Molinia caerulea* with stands of *Pteridium aquilinum* being locally

dominant. The Heath restoration will follow the guidance laid out by Peatland Action Technical Compendium (Nature Scot 2022). All trees in the area will be removed completely to avoid nutrient input from decomposing material and drier micro habitats around tree stumps. The dominance of *Molinia caerulea* suggests the area is wet and the soil nutrient regime is “very poor” (Hill-Ellenberg R+N value of 5 and F value of 8), which indicates that the site is not suitable for natural regeneration of forestry (Pyatt *et al.* 2001). Should drier areas of the site be colonised by birch sapling or other species these will be hand pulled as soon as possible (IUCN 2024).

The encroachment of bracken and the abundance of *Molinia caerulea* will be managed by implementing a grazing regime.

The following steps will be undertaken, under the supervision of an Ecological Clerk of Works, to establish this habitat:

- Step 1. Conifer trees within the area proposed for peatland enhancement, as per Figure 3-1, will be removed. The trees are recently planted (see Plate3-1), so complete removal should be undertaken. Where this is not possible, trees should be felled, cutting the stumps as low as possible. Any existing forestry drains within this area will be blocked using excavated peat sods and/or the removed/ felled trees.
- Step 2. This area will then be fenced off to reduce grazing pressure from deer which are known to be present in the area.
- Step 3. A grazing regime will be implemented to manage the purple moor grass (*Molinia caerulea*) and bracken (*Pteridium aquilinum*) density within the habitat as detailed in the Peatland Management Section below.



Plate 3-1 View of the proposed Peatland Restoration Area

3.4.1 Peatland Management

In addition to the above, this area will be managed for invasives species, particularly Rhododendron and self-seeding conifer trees, for the operational life of the Proposed Project. The level of grazing management required, to ensure bracken and purple moor grass do not become dominant, should not exceed 0.1 LU/ha/yr (Farm Advisory Service 2024). The grazing unit should include the adjacent area of wet grassland to avoid overgrazing of the peatland area. Grazing should be limited to drier months and in particular to May-July where management for purple moor grass is required (NatureScot 2022). Grazing will be limited to cattle grazing should the cover of bracken remain unaffected by the grazing regime or increase.

4. 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 establishment may not have been successful by providing evidence of shortcomings, allowing a revised BMEP to be formulated.

Monitoring results will be reported by the Project Ecologist within a Post-Construction Monitoring Report. Reports detailing the monitoring works carried out, the results obtained and a review of their success, along with any suggestions for amendments to the BMEP will be prepared. The BMEP will be updated and amended where required to improve the efficacy of the enhancement measures.

Monitoring results will be reported by a suitably experienced 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 BMEP will be prepared. Specifically, the BMEP will address the measures relating to Kerry Slug enhancement, native woodland planting and peatland restoration. To confirm that habitat restoration and enhancement has been successful, all areas of restored vegetation (replanted woodland) and enhanced habitats (felled woodland, peatland) will be monitored post-restoration. This will be undertaken in partnership between the Developer, the Project Ecologist and the Landowners. The proposed management actions will be conveyed to each of the landowners and management alterations implemented as required to achieve the targets of the BMEP.

The measures to be reported for each enhancement measure and the frequency of reporting is laid out in Table 4-1.

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

Table 4-1 Monitoring

Feature	Frequency	Measure
Kerry slug enhancement	To confirm that the proposed habitat creation and Kerry Slug translocation have been successful, these habitats will be monitored by a qualified ecologist upon completion and at the following intervals: <ul style="list-style-type: none"> › 1 Year, › 2 Years. › 3 Years, 	› Surveys will be carried in the enhancement areas by suitably qualified professionals, under licence. They will follow Mc Donnell & Gormally (2011) and involve both hand searching and metric refuge trapping and will be carried out in the same locations and roughly around the same time every year to allow a comparison between years. If monitoring demonstrates that the enhancement measures are unsuccessful, the measures will be reviewed, and additional methods will be explored.
Native Woodland Planting	To confirm that the proposed habitat creation has been successful, these habitats will be monitored by a qualified ecologist upon completion and at the following intervals:	› Three 10x10m permanent monitoring plots will be established within the enhancement target area post construction. Each year detailed botanical assessments (relevés) will be undertaken in these plots to assess the enhancement success. › Recommendations for ongoing or remedial management required will be specified within the Post-Construction Management Report.

	<ul style="list-style-type: none"> › 1 Year, › 2 Years. › 3 Years, › 5 Years › 10 Years › 15 Years, › 20 Years › 30 Years 	
<p>Peatland Restoration</p>	<p>To confirm that the proposed habitat restoration and grazing prescription have been successful, these habitats will be monitored by a qualified ecologist upon completion and at the following intervals:</p> <ul style="list-style-type: none"> › 1 Year, › 2 Years. › 3 Years, › 5 Years › 10 Years › 15 Years, › 20 Years › 30 Years 	<ul style="list-style-type: none"> › Five 2x2m permanent monitoring plots will be established within the enhancement target area post construction. Each monitoring year detailed botanical assessments (relevés) will be undertaken in these plots to assess the enhancement success. › Recommendations for ongoing or remedial management required will be specified within the Post-Construction Monitoring Report.
<p>Invasive Species Management</p>	<p>To confirm that the proposed Invasive Species Management has been successful, these habitats will be monitored by a qualified ecologist upon completion and at the following intervals:</p> <ul style="list-style-type: none"> › Annually, until no invasive growth was recorded for two consecutive years 	<ul style="list-style-type: none"> › Surveys will be undertaken by a qualified ecologist › If invasive plants are found to be re-establishing, they shall be treated as per the measures outlined in this report.

5.

CONCLUSION

This BMEP sets out the measures to manage and enhance the biodiversity in the locality of the Proposed Project. Specifically, proposed peatland restoration will result in enhancement of wet heath habitat on the Proposed Wind Farm site and the establishment of native woodland will enhance the woodland habitat within the Proposed Wind Farm site. Finally, establishment of both wet heath and woodland within the Proposed Wind Farm site, along with enhancement measures within the proposed bat felling buffers, will result in habitats of higher suitability for Kerry Slug within the Proposed Wind Farm site.

This BMEP has set out measures to be implemented during establishment and management phases to ensure that the targets of this BMEP are successful. It also provides for monitoring of the target habitats by an ecologist to ensure the success of the measures outlined in the BMEP.

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