Lynemore Wind Farm

Environmental Impact Assessment Report.

Technical Appendix 6.5: Outline Habitat Enhancement and Management Plan

avianecology

CONTENTS

1 INTRODUCTION

1.1.1 This Technical Appendix has been prepared to accompany Chapter 6: 'Ecology' of the Lynemore Wind Farm (hereafter the 'Proposed Development') Environmental Impact Assessment Report (EIAR).

1.1.2 The following terminology is used as relevant in this document:

- Proposed Development - the physical infrastructure for the proposed Lynemore Wind Farm.
- The Application Boundary - the application red line boundary comprising of the Site and Site Access (defined below).
- The Site - everything within the Application Boundary except the Site Access.
- Site Access - the route from the public road to the Site within the Application Boundary.
- The Survey Area – the area over which baseline surveys were conducted. This differs for each receptor and is defined in the relevant technical appendices 6.1-6.4.

1.1.3 This Outline Habitat Enhancement and Management Plan (OHEMP) identifies candidate habitat creation and enhancement search areas and presents outline habitat enhancement and management principles. These will be finalised through consultation with NatureScot and The Highland Council (THC) as the 'Lynemore Wind Farm Habitat Enhancement and Management Plan' (hereafter referred to as the HEMP), following receipt of consent and on completion of detailed site investigation works.

1.1.4 The purpose of the HEMP will be restoration and enhancement of key habitats at the Site, with associated benefits for faunal species present locally and biodiversity more generally. These biodiversity enhancements will be delivered in accordance with the principles outlined in the National Planning Framework (NPF) 4, Policy 3, the intent of which is to '*protect biodiversity, reverse biodiversity loss, deliver positive effects from development and strengthen nature networks*', with the outcome that '*biodiversity is enhanced and better connected including through strengthened nature networks and nature-based solutions*'.

1.1.5 The final details of habitat management measures to be implemented, including specific locations, extents and method statements will be subject to agreements reached with the landowners and other relevant stakeholders (**Section 1.4**), detailed site investigations and input by relevant specialists.

1.1.6 The finalisation of the HEMP will be completed post-consent but prior to the commencement of construction works via a suitably worded planning condition. Once finalised, the HEMP will remain in place as agreed, subject to reviews for effectiveness, for the operational lifetime of the Proposed Development as consented (anticipated to be 50 years) and in accordance with the planning condition.

1.1.7 The HEMP presents outline measures to enhance priority peatland habitats within the Site, and also includes results of the baseline Peatland Condition Assessment which is presented as Annex 1 of this document.

1.1.8 This report should be read with reference to **Figure 6.10:** Outline Habitat Enhancement and Management Proposals Plan.

1.2 Structure of the Habitat Management Plan

1.2.1 The Aims and related Objectives of the HEMP in relation to the Proposed Development would be achieved through the implementation of management prescriptions and habitat creation practices outlined herein. Proposed Aims and Objectives of the HEMP have been identified based on ecological and ornithological features present, consultation responses received and planning documents, including The Highland Council Highland-wide Local Development Plan (THCLDP) and National Planning Framework 4 (NPF4).

1.2.2 Suitable habitat creation and enhancement proposals have been developed making reference both to the character and condition of the habitats present within the Site, and also to wider objectives for biodiversity at a regional level.

1.2.3 The success of management prescriptions and habitat creation in achieving the aims and objectives of the HEMP will be monitored, with the results reported to an advisory group (the 'Habitat Management Steering Group'; HMSG), in accordance with timings and protocols to be agreed with NatureScot and THC. The HEMP once finalised will be a live document, with the habitat management measures implemented being adaptive throughout the lifetime of the Proposed Development in response to the findings of ongoing monitoring.

1.2.4 Blanket bog and peatland habitats on the Site were noted to include obvious and widespread signs of modification and peat erosion, suggesting that these are subject to a degree of modification and are not in a near-natural condition. Peatland habitats have been assessed as being of no greater than moderate condition. As such, measures are proposed to enhance the blanket bog and peatland habitats within the Site.

1.2.5 In addition to on-Site measures, it is intended that appropriate opportunities will be identified in liaison with NatureScot and THC (e.g. via the Peatland ACTION programme) for carrying out or providing funding for peatland restoration elsewhere in the region where it is judged by stakeholders that this will provide the greatest benefit. This will serve to ensure that alongside the measures outlined within this document that the 1:10 (lost:restored) ratio as recommended by NatureScot[1] is met to offset loss of 33.83ha loss of priority blanket bog habitat. It is envisaged that the requirement for and details of this will be drawn up in a 'Peatland Restoration Agreement', which can be secured through an appropriately worded planning condition. This would require the Peatland Restoration Agreement to be agreed by NatureScot and THC prior to the commencement of any development, and to reflect best practice at that time.

1.2.6 While not included within the HEMP due to the likely spatial separation from the Site and wider estate of any measures undertaken, the Peatland Restoration Agreement once agreed will be included as an Annex to the HEMP, to be approved by stakeholders post-consent as a condition of planning.

1.3 Implementation

1.3.1 The HEMP shall be implemented for the operational period of the Proposed Development, with associated works commencing prior to the commissioning of the wind farm, where necessary.

1.3.2 The Applicant will be responsible for finalising, implementing, and carrying out all works associated with the HEMP for the Proposed Development, as consented.

1.3.3 The Applicant shall be responsible for the cost of implementing the HEMP; including the cost of carrying out any monitoring, except where otherwise specified or agreed with the HMSG.

[1] NatureScot (2023). *Advising on peatland, carbon-rich soils and priority peatland habitats in development management*. NatureScot, Inverness.

1.4 Habitat Management Steering Group

1.4.1 A HMSG will be established prior to the finalisation of the HEMP to meet or correspond regularly to discuss the effectiveness of prescribed management measures and monitoring techniques, monitoring results and recommendations for any amendments to the HEMP.

1.4.2 For the first five years of implementation, the HMSG will meet or correspond at least annually.

1.4.3 The following bodies shall be invited to form part of the steering group and review committee:

- The Applicant;
- The Landowners (or their representatives);
- NatureScot;
- Scottish Environment Protection Agency (SEPA);
- Scottish Forestry; and
- THC.

1.4.4 An ecologist appointed by the Owner(s) (at their cost), shall also form part of the HMSG and review panel in an advisory capacity.

1.5 Site Location

1.5.1 The Site is located just south of the A9 near the village of Moy, south of Inverness, in the Scottish Highlands. The survey area ranges from 300m above sea level at the side of the A9, to 618m at the summit of Carn na h-Easgainn. The Site is managed as a shooting estate, with sheep grazing at low stocking densities.

1.6 Current Site Conditions

Habitats

1.6.1 Full habitat descriptions are provided within **Technical Appendix 6.1: Habitats and Vegetation** of the EIAR for the Proposed Development and are not repeated here, but a summary is provided below. Baseline habitats are presented on **Figure 6.3a-f** of the EIAR.

1.6.2 The Site is located within the Lynemore Estate and is mostly open moorland. Areas of open deciduous woodland and commercial plantation lie to the north of the Site. The Farr/ Glen Kyllachy Wind Farm complex lies approximately 2km to the southwest of the Site.

1.6.3 Notably, the Site contains several habitats listed within Annex 1 of Habitats Directive[2], including:

- 5130 *Juniperus communis* formations on heaths;
- 4030 European dry heaths;
- 4010 Northern Atlantic wet heaths with *Erica tetralix*; and,
- 7130 Blanket bogs.

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[2] As defined in The Conservation of Habitats and Species Regulations 2017 as amended in Scotland by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (the Habitats Regulations);

1.6.4 The Site also contains areas of priority habitats listed on the Scottish Biodiversity List (SBL), including:

- Broadleaved woodland – semi-natural;
- Dry heath - acid;
- Wet heath;
- Acid / neutral flush;
- Basic flush;
- Bryophyte dominated spring;
- Blanket bog; and,
- Acid grassland – unimproved

1.6.5 Blanket bog within the Site represents priority peatland, though not considered to be of national interest due to modification effects.

1.6.6 Details of all permanent and temporary, direct and indirect loss of habitats considered to represent Important Ecological Features for the Proposed Development are provided in **Chapter 6: Ecology** of the EIAR, and include loss of:

- 0.011ha direct loss of and 0.14ha indirect loss of semi-natural broadleaved woodland habitats;
- 26.631ha direct loss and 20.96ha indirect loss of blanket bog habitats;
- 0.305ha direct loss and 0.222ha indirect loss of dry dwarf shrub heath habitats;
- 0.258ha direct loss and 0.218ha indirect loss of flush habitat; and,
- 0.060ha direct loss and 0.030 indirect loss of acid grassland habitat.

Protected Species

1.6.7 Full descriptions of baseline conditions relating to protected faunal and ornithological species are provided in **Technical Appendices 6.1 to 6.4** (ecology) and **Technical Appendix 7.1** (ornithology) of the EIAR for the Proposed Development and are not repeated here, but a summary is provided below to provide context to the measures proposed herein.

1.6.8 Important Ornithological Features recorded breeding on Site include upland waders (curlew, dunlin, golden plover and snipe) as well as other moorland species such as red grouse and skylark (both listed on the SBL). Merlin and short-eared owl breed close to the Site within the wider area (see '**Chapter 7, Ornithology'**).

1.6.9 Evidence of the presence of otter, badger and red squirrel, plus potential evidence of water vole was recorded within the Site, in the form of scats, prints and feeding signs, along with suitable foraging habitat and denning features in the wider area. Suitable habitat was also noted in some locations for water vole, wild cat and mountain hare, however no sightings or evidence of these species was noted observed during surveys.

1.6.10 The Site supports a limited assemblage of bat species with identified species recorded comprising common and soprano pipistrelle bats, brown long-eared bats and unidentified myotis species (likely Natterer's or Daubenton's bats). Suitable roosting habitat is available within single trees across the Survey Area, with areas of woodland also suitable for maternity roosts and rock exposures / cliffs also suitable for hibernating bats. Foraging habitat within the upland areas of the Site is limited, likely to be used only on still evenings. At lower elevations, suitable foraging habitat is available associated with woodland and watercourse habitats.

1.6.11 Watercourses within the Site generally provided suboptimal habitat for notable fish species, including salmonids and lamprey with only very localised and small areas suitable for spawning brown trout on the lower sections of the Allt na Loinne Moire. No suitability for freshwater pearl mussel has been identified within the Study Area.

1.6.12 It is likely given the habitats present that the site supports populations of common reptile and amphibian species, including common lizard, frog and toad. The site may also support an assemblage of invertebrates typical of the habitats present, including some notable species.

2 AIMS AND OBJECTIVES

2.1 Approach to HEMP

2.1.1 The Proposed Development has undergone several design iterations in response to the findings of baseline ecological and ornithological studies. These design iterations have sought to reduce potentially significant effects on sensitive ecological and ornithological features and peat reserves thereby complying with the first step of the mitigation hierarchy, i.e. avoidance, whilst balancing the need for the development to contribute a meaningful contribution to Scotland's net zero target. Specifically, the scheme design has sought to avoid habitat losses, minimise watercourse crossings, design the required watercourse crossings sensitively for wildlife, and buffer infrastructure from areas identified as being important for sensitive species. As a consequence of this work, no significant adverse effects are predicted for any important ecological or ornithological features. However, it has long been considered good practice to propose measures to reduce non-significant effects and to provide overall biodiversity enhancements associated with proposed developments, and provision of biodiversity enhancements is also a requirement under NPF4 Policy 3.

2.1.2 In accordance with NPF4 Policy 3, further restoration and enhancement measures to be implemented over the operational lifetime of the Proposed Development are provided within this OHEMP. These are focussed on conserving, restoring and enhancing the overall condition and connectivity of bog habitats within the Site. Such measures will also provide enhanced opportunities for associated biodiversity including protected terrestrial mammal species, breeding waders, invertebrates and plant species which would not be possible without intervention. Together with habitat creation and management of opportunities for associated species, such measures will improve connectivity for wildlife over an extensive area beyond the footprint of the development.

2.1.3 Additionally, a Peatland Restoration Agreement is proposed to compensate for loss of blanket bog habitat at a ratio of 1:10 as recommended in NatureScot's peatland guidance[3].

2.2 Aims of OHEMP

2.2.1 The primary aim of the OHEMP is the enhancement of degraded peatland habitats.

2.2.2 Opportunities for habitat creation, in addition to restoration and enhancement of existing habitats, have been identified to enhance the biodiversity, strengthen nature networks, and also strengthen flood storage and carbon sequestration/storage capability of the Site.

2.2.3 No specific separate Aims and Objectives are proposed for ornithological features, but the habitat enhancements proposed include for consideration of ornithological features within their design, and

[3] NatureScot (2023). Advising on peatland, carbon-rich soils and priority peatland habitats in development management. NatureScot, Inverness

are expected to provide benefits relating to supporting habitats which will maintain and increase abundance, productivity and distribution of Important Ornithological Features utilising the Site.

2.2.4 The effectiveness of management prescriptions and habitat improvements in achieving the aims and objectives of the final HEMP will be monitored, with the results reported, in accordance with timings and protocols to be agreed through the HMSG.

2.2.5 It is proposed that the Aims, Objectives and management prescriptions outlined herein will be further refined in consultation with NatureScot and the HMSG following pre-construction baseline surveys (if required) and/or site investigation works and specialist input as necessary.

2.3 Enhancement of degraded peatland and heath habitats

2.3.1 Both blanket bog and dwarf shrub heath are habitats listed on Annex 1 of the Habitats Directive, and all blanket and modified bog is a conservation priority in the UK.

2.3.2 A Peatland Condition Assessment has been undertaken (provided as Annex 1 to Technical Appendix 6.5) finding that there was no near-natural peatland within the Study area, with peatland habitats within the Study Area were almost entirely modified or actively eroding, with only 1.4% retaining near-natural features. Peatland was found to have extensive erosional gullies and modifying influences including grazing pressure from deer and at lower elevations sheep, evidence of historic burning, self-sown coniferous trees (more frequent at lower elevations), and artificial drainage at lower elevations close to the transition between blanket bog and dry heath habitats. As such there is potential for bog restoration action across the Site.

2.3.3 Peat restoration will be undertaken using traditional Peatland ACTION techniques and by using surplus peat excavated during construction to help reinstate areas that have lost peat through natural erosion (‘peat translocation’). The sections below describe the different restoration methods.

2.3.4 The proposed peatland restoration project would provide significant enhancement to the fisheries and associated biodiversity interest of downstream watercourses, including the River Findhorn and River Nairn through reductions in erosion and runoff.

Peat Restoration using Translocated Peat

2.3.5 The summits and upper slopes of the Site have been extensively degraded by ongoing natural erosion processes. This erosion has resulted in extensive areas of bare peat on flatter summit areas and numerous linear and dendritic (branched) gully patterns on the upper and mid-slopes. While traditional Peatland ACTION techniques are highly effective in areas of relatively localised bare peat, larger open areas remain challenging to restore since spot turving is ineffective and large-scale dressing of bare areas with geotextile is slower in establishing full vegetation cover than turving. Wind farm construction requires the excavation of relatively large footprints of peat, the surface vegetation of cover enables larger scale ‘turving’ than does spot turving. Turving, using vegetated, surface level acrotelmic peat, must take place over sub-terranean catotelmic peat to ensure there is a suitable substrate for the translocated material to establish within. Sealing catotelm with acrotelmic material also has the benefit of sealing the wetter and more carbon rich catotelmic material.

2.3.6 Translocation settings at Lynemore have been identified based on a combination of:

- Current condition – bare areas will benefit most from translocation and these have been prioritised over part-vegetated areas.
- Slope angle – neutral or gently sloping areas are more suited to translocation than moderately sloping areas, the former requiring fewer mineral retention structures and having greater potential to pool and retain water.

- Proximity to infrastructure – the transport of peat to the translocation areas requires infrastructure to enable the passage of vehicles carrying peat material – translocation areas have been identified based on the presence of proposed wind farm tracks or the presence of existing tracks.

2.3.7 Given these criteria, the following settings have been identified for translocation:

- Open bare ground; and,

- Bare gullies within 15 m of infrastructure.

2.3.8 The methods are detailed below. Use of peat in this way is seen as preferable to reuse in landscaping infrastructure, with organic soil and overlying vegetation assumed to be used for this purpose.

<u>Restoration of open bare ground</u>

2.3.9 There are approximately 8 ha of open bare ground within the Site boundary, much of it running alongside the existing summit track between Carn na h-Easgainn and Carn nam Bo-airigh or adjacent to the track descending the north facing hillslopes to the west of Allt na Loinne Moire. Examples from satellite imagery are shown on **Plates 1 a and b**. Peat excavated from turbine locations will be used to reinstate lost peat deposits in these bare areas to depths of either 0.5 m or 0.75 m, depending on the depth of peat in the residual peatlands surrounding them. On the higher summits, where peat loss has been most severe, reinstatement depths will be c. 0.5 m, while on the lower more sheltered slopes where peat is deeper, reinstatement depths will be greater.

Plate 1 a) left: bare peat adjacent to existing road on ridge between Carn na h-Easgainn and Carn nam Bo-airigh, b) right: bare peat adjacent to existing road

2.3.10 Catotelmic peat will be placed first, with acrotelmic peat placed over the top. The local topography of each translocation area will be used to define mineral bunds, which will be constructed of large grade rock materials of significantly greater density than the peat, holding it in a series of adjoining cells. These peat-filled cells will provide a number of benefits:

- They will seal the bare, oxidising flanks of the hagged areas within which they are placed, reducing oxidative loss of carbon relative to the current condition.

- They will reduce drawdown of water tables in these surrounding areas by bringing the ground surface closer to its original level.

- It will put peat excavated from infrastructure into natural low points within the landscape which already have a tendency to collect water, this also helping guarantee the longevity of peat in the translocation areas.

2.3.11 The sequence of working in each area will comprise:

- Placement of catotelmic fill for an individual cell;
- Construction of the cell margin using rock; then,
- Placement of acrotelmic material over the catotelm.

2.3.12 Cells farthest from the access point (usually a wind farm or existing track) will be completed first, with excavators working back towards the access point before sealing the translocation area with the final bund. Monitoring points will be established within each translocation area to track progress (see **Section 5** below). **Figure 6.10** shows the locations of open ground 'bund and translocate' areas across the Site.

Restoration of bare gullies within 15 m of infrastructure

2.3.13 Proposed wind farm infrastructure intersects gullies and eroded areas over much of the summit and open areas at the Site. Where this is the case, the proposed construction techniques will create mineral bunds that help prevent the continued erosion of peat and substrate along gully floors. They also provide localised low points within which peat excavated from infrastructure (including from track alignments) can be reused to help plug eroding gully sidewalls and floors. Long reach excavators used may have booms of up to c. 15 m, and therefore at Lynemore, gully footprints within 15 m of infrastructure have been specified for infill with peat to target depths of 0.5 m. If necessary rock berms will be placed at the downslope limit of the downslope side of each gully.

2.3.14 In some cases, there are short sections of gully that lie outside the 15 m limit but that connect with either open bare ground or with other sections of gully on another infrastructure alignment. In these cases, small low ground pressure excavators will be used to connect the gully fill sections over slightly longer distances to produce a contiguous restoration area.

2.3.15 **Figure 6.9** shows the locations of all gully fill locations.

Volume Requirements

2.3.16 Based on the mapped footprints of open ground and bare gullies and the target depths identified for each discrete area shown on **Figure 6.10**, there is capacity for translocation of c. 104,310 m^3 of peat, which is broadly equivalent to the surplus volume (after reinstatement of temporary infrastructure) identified in the Technical Appendix 8.3: Outline Peat Management Plan (OPMP). Dependent on the final calculated excavation volume, which would be refined post-consent subsequent to ground investigation, detailed micrositing and detailed design, this volume might increase or decrease slightly. In the event that the surplus volume was to increase, target depths could be increased providing further capacity. Equally, if the calculated surplus were to reduce, target depths could be reduced or the number of areas within this part of the restoration proposals could be reduced and alternate restoration methods specified (e.g. an uplift in gully reprofiling for the gullies intersecting infrastructure, or bunding and geotextiles in some of the larger bare peat areas).

2.3.17 The estimated division in volumes between open bare ground areas and gully restoration are shown in **Table 1** below.

Table 1 Estimated areas restored using translocated peat

Restoration type	Area under treatment (m^2)	Estimated reuse volume (m^3)
Open bare ground (variable target depths up to 1.25 m)	82,300	81,170
Gully restoration (0.75 m target depth)	30,850	23,140
Totals	**113,150**	**104,310**

Peat Restoration using Traditional Techniques

2.3.18 Peatland ACTION have published a technical compendium[4] which details restoration techniques commonly used in blanket and raised bogs across Scotland to deliver peat restoration. These techniques are well evidenced and in widespread use on both publicly funded (Peatland ACTION) projects and on Peatland Code projects. The techniques are suitable for use in wind farm developments and form a key component of the proposed compensation package at Lynemore. The following proposals are expanded upon below:

- Restoration by reprofiling and damming of gullies on shallow slopes <5°;
- Restoration by reprofiling and localised damming / baffles of gullies on moderate slopes 5-7.5°;
- Restoration by reprofiling only on steeper slopes >7.5°; and
- Hand restoration of 'micro-erosion'.

2.3.19 The methods are detailed below.

<u>Restoration by reprofiling and damming of gullies on shallow slopes <5°</u>

2.3.20 Gullies have been reviewed against slope data available for the site to identify those on slopes < 5° that are sufficiently long and linear (non-sinuous) to enable good machine access, and with sidewall heights less than 2 m (indicated from the prevailing peat depths probed at the site). Gullies of this type are generally considered optimal for restoration using Technique 7.1 ('Hag / gully / peat bank reprofiling') in NatureScot's Peatland ACTION Technical Compendium.

2.3.21 Accessibility by excavators (which would undertake the work) has also been reviewed to ensure access is possible from either the proposed wind farm track network or existing track network. Gullies in these settings may be suitable for both gully sidewall reprofiling (to reduce areas of exposed bare peat) and damming of gully floors using stone, timber or other forms of dam construction (to slow the flow of water and minimise erosion), as detailed in Techniques 6.1 and 6.2 of the Technical Compendium.

2.3.22 Together these measures will hold more water on the slopes, reducing the rate of overland flow to watercourses into which the gullies feed, reducing particulate losses to these watercourses and improving water quality. Gullies in this class are shown on

<u>Hand restoration of micro-erosion</u>

2.3.23 In some parts of the site, notably on the Beinn nan Cailleach summit and on the plateau that sits slightly further to the north, peatland morphology resulting from erosion is so complex that it would be impractical to improve using excavators. **Plate 2** shows examples of these locations.

[4] https://www.nature.scot/doc/peatland-action-technical-compendium [accessed 25/03/2025]

2.3.24 Technique 7.3 ('Techniques to re-vegetate gullies, peat pans and micro-erosion – textile application') within the Technical Compendium suggests the use of geotextiles where machine access is not possible and there is insufficient availability of turves to borrow for restoration. These techniques can also be used in combination with other bare peat restoration techniques (such as the use of dams to slow flow). It is recommended that the three bare areas shown on **Figure 6.10** are restored using these techniques in combination. Given that these summit areas drain radially into the surrounding gully systems, gully restoration and summit restoration micro-repair should result in a substantial reduction in particulate and carbon loss from the upper hillslopes, while also slowing runoff and the 'flashiness' of watercourses draining from the Site. The total area to be directly restored is shown in **Table 1** below.. Total areas are summarised in **Table 2** below.

<u>Restoration by reprofiling and localised damming / baffles of gullies on moderate slopes 5-7.5°</u>

2.3.25 Where gullies are located on slightly steeper slopes, they may be suitable for reprofiling, but the frequency of dams required may make them ineffective other than in locations where contemporary erosion is most pronounced, e.g. at active 'knickpoints' in the gully floors (locations where headcutting is ongoing and there is an active erosion step). In these locations, installing a localised bed check in the form of a stone or timber dam and associated splash plate may be effective. Gullies in this class are also shown on **Figure 6.10** with total areas summarised in **Table 2**.

<u>Restoration by reprofiling only on steeper slopes >7.5°</u>

2.3.26 Gullies on steeper slopes are unlikely to be suited to damming, however, reprofiling may still be beneficial. Reprofiling will be undertaken using low ground pressure excavators in accordance with the techniques listed in section 7.1 of the Peatland ACTION technical compendium. Gullies in this class are shown on **Figure 6.10** and the area directly restored in **Table 2**.

<u>Hand restoration of micro-erosion</u>

2.3.27 In some parts of the site, notably on the Beinn nan Cailleach summit and on the plateau that sits slightly further to the north, peatland morphology resulting from erosion is so complex that it would be impractical to improve using excavators. **Plate 2** shows examples of these locations.

2.3.28 Technique 7.3 ('Techniques to re-vegetate gullies, peat pans and micro-erosion – textile application') within the Technical Compendium suggests the use of geotextiles where machine access is not possible and there is insufficient availability of turves to borrow for restoration. These techniques can also be used in combination with other bare peat restoration techniques (such as the use of dams to slow water flow). It is recommended that the three bare areas shown on **Figure 6.10** are restored using these techniques in combination. Given that these summit areas drain radially into the surrounding gully systems, gully restoration and summit restoration micro-repair should result in a substantial reduction in particulate and carbon loss from the upper hillslopes, while also slowing runoff and the 'flashiness' of watercourses draining from the Site. The total area to be directly restored is shown in **Table 1** below.

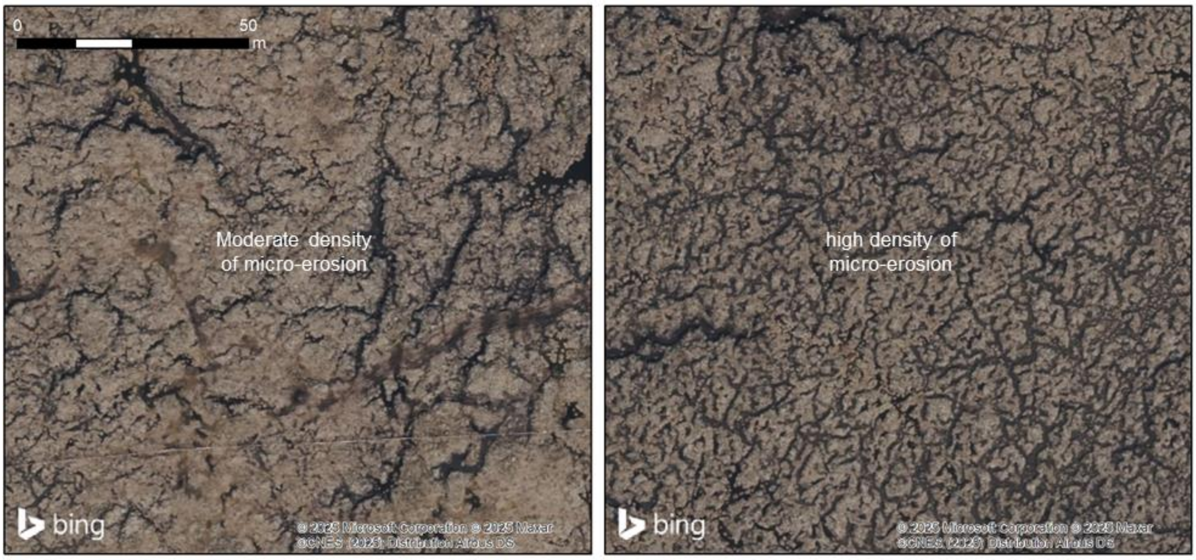

Plate 2 a) left: moderate density of micro-erosion east of Beinn nan Cailleach, b) right high density of micro-erosion north of Beinn nan Cailleach

Table 2 Estimated areas restored using traditional techniques

Restoration type	Direct area under treatment (m^2)
Restoration by reprofiling and damming of gullies on shallow slopes <5°	161,600
Restoration by reprofiling and localised damming / baffles of gullies on moderate slopes 5-7.5°	148,250
Restoration by reprofiling only on steeper slopes >7.5°	101,600
Hand restoration of 'micro-erosion'	196,000
Totals	**541,450**

Total area benefitting from proposed restoration measures

2.3.29 Six restoration techniques have been proposed for the upper slopes of the Site. These techniques will be applied over various footprints across the Site but will also benefit the adjacent peatlands. It is commonplace to assign an indirect buffer distance to impacts from proposed wind farm infrastructure, and to use an equivalent buffer to estimate potential benefits from compensatory works (e.g. NatureScot's Peatland Condition Assessment guidance, NatureScot 2016[5]). Therefore, the total estimated benefitting area, or compensation area, is equivalent to the restored footprints and the benefitting adjacent areas, defined by a buffer. The buffer chosen for indirect impacts and therefore applied to the restoration area is 10 m. Buffers cannot overlap in the calculation, though in practice, an area of peatland that has not been directly restored may experience compound benefits from adjacent restoration measures (e.g. gully restoration on one side of hagg and open ground translocation on the other).

2.3.30 **Table 3** shows the total areas benefitting from the six different restoration techniques described above, this area being equivalent to the total compensation area associated with peatland restoration. No buffer has been applied to the hand restoration of micro-erosion, since the peat in this area is too shallow to lead to water table recovery to any notable depth. Infrastructure footprints (including

[5] https://www.nature.scot/sites/default/files/2023-02/Guidance-Peatland-Action-Peatland-Condition-Assessment-Guide-A1916874.pdf [accessed 25/03/2025]

earthworks have been clipped out of the buffers, since these areas will not benefit from proposed restoration).

Table 3: Total Areas benefitting from Peat Restoration

Restoration type	Direct area under treatment (ha)	Adjacent area benefits (ha)	Total benefitting area (ha)
Open bare ground translocation	8.23	7.37	15.6
Translocation into gullies	3.08	12.72	15.8
Restoration by reprofiling and damming of gullies on shallow slopes <5°	16.16	42.24	58.4
Restoration by reprofiling and localised damming / baffles of gullies on moderate slopes 5-7.5°	14.83	45.87	60.7
Restoration by reprofiling only on steeper slopes >7.5°	10.16	37.94	48.1
Hand restoration of 'micro-erosion'	19.6	0.0	19.6
Totals	**72**	**146**	**218**

2.3.31 In total, 218 ha of peat will be restored.

Additional Measures

2.3.32 In addition to the peat restoration measures outlined above, routine management to control peatland risk factors will be undertaken.

Removal and control of regenerating trees

2.3.33 The establishment of regenerating and self-seeded trees within the blanket bog, wet modified bog and dwarf shrub heath habitats of the Site, particularly adjacent to the commercial plantation forestry to the north, poses the following risks to the upland moorland habitat quality:

- Increased evapotranspiration from growing trees resulting in increased competition for water resources within surrounding bog and heathland communities;
- Canopy establishment resulting in the shading of component plant communities of surrounding bog and heathland communities; and,
- The build-up of needles impacting upon soil compositions of surrounding bog and heathland communities.

2.3.34 In addition to the potential harm to upland moorland habitat of colonising trees, including commercial conifers, over time a developing canopy may provide increased interest for foraging and commuting bats, exacerbating potential operational mortality risks, and in time canopy closure would result in displacement of upland open ground bird species, particularly breeding wader species.

2.3.35 Within upland and blanket bog areas of the Site as identified by up to date survey, habitat management principles will include the control of non-native conifer species saplings and seedlings within this search area, with the objective of managing colonising conifer species to prevent excessive encroachment and the associated risk of degradation of the bog and heathland habitats.

2.3.36 The Site may be further divided into 'Habitat Management Compartments' for sapling and seedling control and monitoring as agreed appropriate, on the basis of an updated detailed botanical survey by a suitably competent ecologist and in consultation with the HMSG

2.3.37 Sapling and seedling control within the search area would seek to remove and/or control the establishment of conifer specimens, whilst limiting disturbance of surrounding bog and moorland habitats and watercourses. Removal and control measures to be employed are anticipated to vary depending upon the extent of establishment and underlying ecological sensitivities. Methods for control of regenerating trees will depend on the age/size and density of the trees to be removed. It is likely that some ongoing control may be required throughout the lifetime of the wind farm (50 years) as seed banks may persist over long periods and seeding from the adjacent plantation is likely to be an ongoing process for as long as mature conifer trees are present on the adjoining land.

2.3.38 Although the main target group for tree removal will be non-native conifer species regenerating from the adjacent plantation woodland, all regenerating tree species will be removed where they occur within sensitive peat areas (i.e. blanket or wet modified bog), as broadleaved species will still contribute to drying the water table and degrading these habitats further. It should be noted however, that this applies only to sensitive bog habitat areas; any scattered broadleaves on soil or rocky substrate and so not compromising the condition of underlying high value habitat, will be retained where the trees are not contributing to degradation of underlying higher value habitat.

2.3.39 Where broadleaved trees sit within pockets of lower value habitat such as acid or marshy grassland, and their presence is likely to provide wider biodiversity benefit, then they will be left in situ as their removal will not notably contribute to enhancement of the bog and heath habitats and their presence increases overall habitat heterogeneity.

2.3.40 An initial trial period of up to five years from implementation is suggested, after which the effectiveness of, or requirement for additional, measures and their frequency would be re-assessed in consultation with the HMSG and additional relevant stakeholders.

2.3.41 The frequency of sapling removal and control measures and monitoring for the initial trial period would be agreed in consultation with the HMSG prior to implementation.

Control of bracken

2.3.42 Bracken has not been noted as a problem species on Site, however, bracken is a successful coloniser and can spread into grassland, moorland and heathland, and reduce habitat quality of sensitive habitats it encroaches on. Additionally, bracken can increase wildfire risk, and often creates a reservoir for ticks which may cause disease in livestock and humans.

2.3.43 Management of vigorous bracken growth can help to restore, enhance or maintain the open nature of heathland and moorland of conservation value, and also benefit some priority species. It is however acknowledged that bracken can have conservation benefits and can provide a valuable habitat for wildlife, especially where the bracken canopy is relatively open. It is an important component of habitat for invertebrates and bird species.

2.3.44 The appropriateness and scope of bracken management in specific locations within the Site , and methods to be employed, will be determined based on detailed surveys of the extent of bracken cover in identified areas, as well as practical considerations re the achievability of effective control based on factors such as topography, accessibility and whether removal of bracken may increase the risk of soil erosion. Areas considered to provide biodiversity benefit will also be identified and excluded, such as areas providing good invertebrate habitat and low to medium bracken density (<c20 fronds m2), in steep south facing sunny, sheltered locations.

2.3.45 Bracken control will be planned and conducted in accordance with the most up to date relevant guidelines, e.g. the Scottish Environmental and Rural Services (SEARS) bracken control guidance[6]. Chemical treatment is no longer an option for bracken management in Scotland and is not generally appropriate for habitat management plans under most circumstances. Other potential forms of control include manual (hand cutting, hand pulling, whipping) or mechanical (cutting/rolling/crushing) treatments (where accessibility and slope allow), as well as the use of livestock. Initial treatment will be followed by repeated follow-up treatments, with dense and vigorous stands requiring cutting/flailing/rolling up to three times per year outwith the bird breeding season. Following primary treatment, livestock grazing can be used as part of an ongoing control strategy, complementing mechanical methods. Where removal of bracken leaves bare or sparsely vegetated ground, removal of litter and reseeding of underlying habitats may be recommended as appropriate.

3 MONITORING AND REVIEW

3.1 Overview

3.1.1 The OHEMP will be updated to reflect site investigation works prior to construction, with the final HEMP produced in accordance with this and agreed with the HMSG.

3.1.2 Proposed monitoring prescriptions to assess progress towards achieving the Aims and Objectives are summarised herein and will be agreed through consultation with the HMSG.

3.1.3 The monitoring schedule will comprise regular monitoring during establishment of the habitat creation and enhancement measures (generally taken as years 1 to 5, dependent on specific measures implemented), with ongoing monitoring at decreased frequency carried out for the remainder of the operational lifetime of the Proposed Development, as appropriate to the agreed methods to be applied. The frequency of monitoring thereafter will be agreed with NatureScot and the HMSG. The monitoring schedule will allow for assessment of the effectiveness of implemented measures, and remediation if required.

3.1.4 The requirement for any updated baseline surveys to act as Year 0 for monitoring purposes would also be identified and undertaken at the appropriate time (such as, within the first year of operation of the Proposed Development and during the growing/ breeding season May to September, inclusive).

3.1.5 The monitoring plan shall be agreed through the HMSG and will seek to collect consistent and standard environmental information to enable monitoring comparisons between sample years and to allow comparisons between different sites and scientific literature as required.

3.2 Monitoring of Peat Restoration

Monitoring

3.2.1 The proposed restoration measures will be monitored to determine the success of each measure and identify needs for mitigation or additional work to address any locations that are not progressing towards their intended outcome.

3.2.2 In simple terms, the overall objective is to achieve full vegetation cover across the bare areas (gully floors, larger open areas and gully sidewalls) and arrest erosion occurring in gully floors. A secondary objective is to restore water tables in areas adjacent to restored footprints. The former objective can

[6] Scottish Environmental and Rural Services (SEARS) 2008. Bracken Control: A Guide to Best Practice. Available at https://www.ruralpayments.org/topics/all-schemes/agri-environment-climate-scheme/management-options-and-capital-items/primary-treatment-of-bracken---manual/guidance-for-bracken-management/ last accessed 15/01/2024

be monitored through observation, and the latter through either direct monitoring or by observing changes in ground moisture conditions as a proxy for water table change (e.g. increased ponding, slower runoff rates or vegetative response to higher water tables – the latter measured by quadrat).

Remedial Measures

3.2.3 Remedial measures to be applied in the event monitoring indicates that objectives are not being met will depend on the restoration technique being applied.

3.2.4 For open bare ground (both that restored using translocated peat and that restored by hand techniques), the most likely departure from proposed restoration trajectories will be a failure of any residual areas of bare peat to revegetate. This may be a function of the short growing season at altitude in Scotland, an absence of suitable seedstock in the acrotelmic material placed at the surface, or adverse short term climatic conditions damaging exposed peat in the aftermath of works. In this case, the most effective forms of remedial measures would be to:

- Ensure surface water is being retained by inspecting for water losses (e.g. new rills or gullies formed in bare surfaces);
- Plug plant target species in bare areas to aid recovery of a full vegetated surface (species to comprise *Eriophorum* and *Sphagnum*);
- Inspect for grazing impacts on new growth, and if necessary, preclude stock through fencing; and
- Check condition of geotextile used in hand works (since geotextiles have a limited lifespan and may require repair or replacement) and install additional geotextiles if needed.

3.2.5 The most likely departure from proposed restoration trajectories in gullies would be failure of dam structures in the gully floors, or continued bare areas in areas of reprofiling. In the case of the former, monitoring of gullies should be used to inform remedial works, most of which could likely be addressed via hand repair of dams, while a record of sidewall condition should be used to inform periodic gully repair, if required. Because all gullies have been inspected as part of the restoration proposals for the wind farm, access should continue to be possible for low ground pressure excavators capable of undertaking the works.

3.2.6 It is important that any fund attached to the OHEMP proposals is ringfenced for the operational life of the project, and that sufficient budget is retained for monitoring and mitigation.

3.3 Monitoring of other Ecological and Ornithological Features

3.3.1 Monitoring will consist of the following actions:

- Vegetation Monitoring: a habitat condition assessment will be undertaken during the summer months (June-August inclusive) at Year 0 to establish baseline habitats and repeated in each monitoring year (Year 1, Year 3, Year 5, Year 10 and every five years thereafter for the lifetime of the Proposed Development). Photograph reference locations will be used to monitor habitats and surveys will only be undertaken.
- Self-seeded woodland: identification of self-seeded woodland and scrub will be identified and removed or managed, as required, with checks conducted and further removal as required every five years for the lifetime of the Proposed Development.
- Bracken control: identification of bracken cover above 'Occasional' frequency will be identified and removed or managed, as necessary, in accessible areas, with control carried out every two years up to Year 10, and every five years thereafter as necessary.

3.3.2 The HMSG will meet or correspond at least annually. Reports detailing results and providing recommendations based on these results will be provided in all years where monitoring is carried out. Frequency of monitoring and reporting may be adjusted as deemed appropriate by the HMSG based on the results of monitoring.

3.3.3 The HEMP is intended to remain a live document which will be updated and amended, as necessary on result of site investigation works and monitoring.

4 SUMMARY

4.1.1 This OHEMP provides a mechanism to reduce adverse environmental effects and also to provide demonstrable enhancements for important ecological and ornithological features and biodiversity in general across the Site and surrounding area.

4.1.2 This will be achieved through the enhancement of degraded peatland and heath habitat, using the following measures:

- Peat Restoration using Translocated Peat
- Peat Restoration using Traditional Techniques
- Removal and control of regenerating trees; and
- Control of bracken.

4.1.3 The success of management prescriptions and habitat creation in achieving the aims and objectives of the HEMP will be monitored, with the results reported to the HMSG, in accordance with timings and protocols to be agreed with NatureScot and THC.

4.1.4 The HEMP, once finalised, will be a live document, with the habitat management measures implemented being adaptive throughout the lifetime of the Proposed Development in response to the findings of ongoing monitoring.