

## **TA6.5 Outline Habitat Management Plan**



# MacArthur Green

**GLENSHERO WIND FARM**  
**Outline Habitat Management Plan**  
**Technical Appendix 6.5**

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## 1 INTRODUCTION

MacArthur Green was commissioned by RES Ltd on behalf of Simec Wind One Ltd to provide an Outline Habitat Management Plan (OHMP) describes the proposed habitat management measures in relation to the Glenshero Wind Farm (hereafter referred to as the 'proposed development').

This report has been produced by MacArthur Green and in accordance with Scottish Natural Heritage (SNH) guidelines. All staff contributing to this technical appendix have undergraduate and/or postgraduate degrees in relevant subjects, have deep professional ecological impact assessment and ecology survey experience, and hold professional membership of the Chartered Institute of Ecology and Environmental Management (CIEEM). The report has been reviewed and approved by David MacArthur of MacArthur Green and a copy of his CV is included in EIAR Volume 4: Technical Appendix 1.2.

This OHMP sets out in the following sections the:

- Background sources informing the OHMP;
- Aims, objectives and management prescriptions;
- Habitat Management Search Areas;
- Monitoring programme; and
- Management and monitoring timetable.

The proposed development is located within the Glenshero Estate, which hosts a wide range of habitats and species, including some of high conservation value at a national and European level, which have been considered in this OHMP. The OHMP also takes into consideration existing and future land management practices and socio-economic factors as well as environmental impacts, and its aims and objectives are designed to be compatible with these.

The management recommendations within this OHMP are based on the findings of the Chapter 6: Ecology and Chapter 7: Ornithology assessments within Volume 2 of the Glenshero Wind Farm Environmental Impact Assessment Report ("EIAR"), as well as other background sources outlined in Section 2.

Significant effects during the operational period of the proposed development were predicted in Chapter 7: Ornithology which require mitigation or compensation under the terms of the EIA Regulations. No significant unmitigated ecological effects were predicted in Chapter 6: Ecology. Whilst it is not necessary to mitigate or compensate for likely non-significant effects, the OHMP would be developed as an example of best practice measure for the purposes of biodiversity enhancement. The main mitigation and enhancement measures included within this OHMP include:

- **Blanket bog:** two areas would be identified within the Glenshero Estate (and outside of the proposed turbine area) where blanket bog quality can be improved. This would also benefit breeding golden eagle and waders by improving nesting conditions (for waders), foraging habitat and prey availability, and provide areas of alternative habitat for waders should any displacement effects occur due to the presence of the proposed development. One search area overlaps with the Monadhliath Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI) and so any management here would seek to improved conditions for the designated site's blanket bog and breeding bird assemblage.

- **Heather management:** two management units within the core foraging ranges of breeding golden eagles would be managed to improve foraging conditions by increasing heather and dwarf shrub coverage which would increase abundances of golden eagle prey such as red grouse and mountain hare.
- **Woodland creation:** two management units would be identified which would be used to plant suitable low density native woodland. This would provide improved conditions for eagle prey, as well as provide shelter for deer, thereby reducing grazing and trampling pressure elsewhere within the estate, including within the Monadhliath SSSI.
- **Wind Farm deer carcass relocation:** Any deer carcasses or grallochs would be removed from the proposed development site and 500 m buffer on a regular basis, to reduce the attractiveness to foraging eagles throughout the operational period, and therefore reduce collision risks with turbines. Carcasses would be placed at suitable locations within 2 km of golden eagle territory centres to provide supplementary food, particularly during winter months.

A final Habitat Management Plan (HMP), which would include confirmed Management Units where the aims would apply, and specific prescriptions, would be agreed with The Highland Council in consultation with SNH prior to the commencement of construction of the development.

## 2 BACKGROUND SOURCES INFORMING THE OHMP

The development of this OHMP has been informed not just by baseline surveys for the proposed development, but also by the recommendations in various reports relating to the Glenshero Estate, as well as SNH (2016) *Planning for development: What to consider and include in Habitat Management Plans, V.2* guidance. The OHMP is aligned with a wide variety of recommendations identified in these reports, as outlined below.

### 2.1 Environmental Impact Assessment Report

#### 2.1.1 Ecology

The most common and widespread habitats within the site, and wider Glenshero Estate, are blanket bog and wet heath communities; specifically, National Vegetation Classification (NVC) communities M15 *Trichophorum germanicum* – *Erica tetralix* wet heath, M17 *Trichophorum germanicum* – *Eriophorum vaginatum* blanket mire and M19 *Calluna vulgaris* – *Eriophorum vaginatum* blanket mire.

A number of dry heath communities are present over the steeper slopes, summits, knolls and rocky plateaus. The most common of these are the wind clipped and prostrate montane *Calluna* heaths H13 *Calluna vulgaris* – *Cladonia arbuscula* heath and H14 *Calluna vulgaris* – *Racomitrium lanuginosum* heath.

The majority of peatlands within the site and wider Glenshero Estate show evidence of degradation and erosion, and pressure from grazing preventing regeneration in some areas. Natural regeneration of woodland is restricted by grazing pressure from deer and sheep. Current deer densities of approximately 16 deer per km<sup>2</sup> within the Estate are more than triple the recommended level for natural woodland regeneration (five deer per km<sup>2</sup>)<sup>1</sup>.

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<sup>1</sup> Putman, R., Langbein, J., Green, P. and Watson, P. (2011). Identifying threshold densities for wild deer in the UK above which negative impacts may occur. *Mammal Review*, 41(3), pp.175-196.

Chapter 6: Ecology of the EIA Report predicted unmitigated non-Significant adverse effects for all ecological receptors taken forward for assessment, namely blanket bog, wet heath, dry heath, and the Monadhliath SAC and SSSI and River Spey SAC and SSSI. No significant effects on protected species were predicted when standard best-practice procedures are adopted during the construction period.

### 2.1.2 Ornithology

The site and wider Glenshero Estate provides suitable nesting and foraging habitat for a number of high conservation species, including golden eagle, golden plover, dunlin and greenshank. Some habitat loss and displacement effects associated with the proposed development are therefore likely during the operational period for these species.

Significant Moderate adverse effects were predicted for greenshank during the operational period, as well as the breeding wader component of the Monadhliath SSSI (golden plover, dunlin and greenshank). Although Minor adverse and non-Significant effects were predicted for golden eagle, this is a key ornithological species of concern to be considered in the OHMP because of the importance of the Glenshero Estate for the regional population. Because golden eagle home ranges are large, holistic management aimed at conserving habitat within them could also make substantial contributions to meeting targets for other species and habitats of conservation concern, including breeding waders, black grouse, blanket bog and wet and dry heath.

## 2.2 Glenshero Estate Environmental Recommendations Report (2017)

The *Environmental Recommendations Report* (2017) produced by the Spey Catchment Initiative, for the Glenshero Estate, identified a set of recommendations towards developing a broad, aspirational vision for the land and water environment within Glenshero Estate. The report received input from multiple environmental organisations and stakeholders, including Scottish Natural Heritage (SNH) and the Cairngorms National Park.

The *Environmental Recommendations Report* identified seven key recommendations for enhancing the environment on Glenshero Estate. These recommendations are designed to be complimentary, and account for existing and planned land uses in Glenshero. The key recommendations relate to the following:

- A Strategic Vision;
- Native Woodland;
- Riparian Woodland;
- Water: Natural flow management;
- Peat: Restoring damaged peatlands;
- Protecting and Connecting Habitats; and
- Communication and Engagement.

## 2.3 MDMG Strategic Deer Management Plan (2014)

Existing conditions within the Glenshero Estate are influenced by deer, and the estate is part of the Monadhliath Deer Management Group (MDMG). The MDMG produced a Strategic Deer Management Plan (SDMP) covering the period 2014-2024, with the support of SNH. Within the SDMP, a strategic habitat management programme was devised to help improve habitats for red deer, as well as wider

environmental benefits (e.g. carbon storage, water quality management and woodland / riparian restoration, nature conservation).

Four project aims were created in the SDMP, which with careful management, can be considered as a basis for the Glenshero Wind Farm HMP to benefit both red deer and the sensitive receptors identified above, including golden eagle.

- Expansion of woodland cover;
- Increase deer access to lower ground;
- Expand heather at middle altitudes; and
- Improve blanket bog condition.

#### **2.4 RSPB Glenshero Estate: Advisory Report (2010)**

Based upon the findings of bird and habitat surveys conducted by RSPB across the Glenshero Estate in 2010, recommendations for future management were provided, forming broad principles for each of the priority bird species recorded, based on their habitat requirements. Despite targeting different areas of the estate for different species, management prescriptions were all based on the same principles: creating suitable habitat for nesting and feeding. These are:

- A reduction in deer numbers to increase the diversity of structure and composition in the field layer, which is crucial for the nesting and feeding requirements of all the priority species – this need not be a complete cull across the whole estate, since a sustainable level of grazing is required to maintain areas of open vegetation.
- The creation of new native woodlands, through planting and/or natural regeneration, to provide suitable nesting cover, food and brood rearing habitat for black grouse.
- Careful management of livestock grazing to create a suitable range of habitats for upland waders, providing open areas for feeding and leaving taller, denser areas for nesting.
- Drainage grips should be blocked to re-wet flushes, mires and bogs.

#### **2.5 Glenshero Estate Forest Plan (2014)**

Woodland in Glenshero Estate is managed by Bidwells on behalf of the estate. Plans for future development are outlined in the 2014 Glenshero Estate Forest Plan. Existing plans include:

- The expansion of native woodland cover to 850 hectares, and linking of existing woodland areas.
- Riparian woodland creation at appropriate locations along the River Spey.
- Removal of plantation woodland and replacement with i) open ground where planted on peat, or ii) native woodland where yields are low.
- Restocking of high yield sites with commercial woodland and creation of new areas of commercial woodland.
- Inclusion of areas of long-term retention for biodiversity, landscape and deer.
- Naturalisation of existing and planned forest areas to account for landscape context.



### 3 AIMS OF THE OUTLINE HABITAT MANAGEMENT PLAN

Based on the results of baseline surveys, and consideration of recommendations in the reports outlined above, the OHMP's aims are as follows:

- **Aim 1: Restore and enhance the blanket bog resource.** Increase the quality / extent of Annex I blanket bog habitats within the Glenshero Estate, for their intrinsic conservation value, as well as for improving habitat for golden eagle, waders and other species, compensating for any loss incurred as a result of the proposed development.
- **Aim 2: Enhance golden eagle foraging habitat.** Increase the quality / extent of Annex I dwarf shrub heath habitats within the estate, for their intrinsic conservation value, as well as for improving habitat for golden eagle and grouse species, compensating for any loss incurred as a result of the proposed development.
- **Aim 3: Increase native woodland coverage.**
- **Aim 4: Reduce deer grazing pressure on blanket bog and montane, wet and dry heaths.** Expand coverage of native woodland and scrub within the estate for its intrinsic conservation value, as well as to reduce deer grazing impacts on blanket bog, heath and other habitats, and provide improved habitat quality for golden eagle prey, compensating for any loss incurred as a result of the proposed development.
- **Aim 5: Reduce golden eagle collision risk.** Reduce the attractiveness of the wind farm area to golden eagle via deer management (gralloch removal/relocation) and provide supplementary feeding for territorial pairs.

### 4 HABITAT MANAGEMENT UNIT SEARCH AREAS

A series of possible Habitat Management Unit areas have been identified within the Estate to help achieve the aims outlined in Section 3 (EIAR Volume 3: Figure 6.12). Two Management Units per habitat management type have been identified to account for the distribution and numbers of breeding golden eagle within the Estate (see EIAR Volume 3: Technical Appendix 7.3, Confidential Figures 7.3.2 and 7.3.3 for details of nest locations and territory ranges), and the greater benefits of having a wider distribution and increased potential connectivity of enhanced habitats. The extent of units identified are based on existing GIS datasets collected on features such as soil type and peat depth, and therefore reflect suitability for selection (see below for details). The extent of these search areas may be subject to refinement prior to finalisation of the HMP, but recommended minimum requirements are considered in this report.

#### 4.1 Habitat Management Units 1a and 1b: Blanket Bog & Wet Heath

As described in the *Environmental Recommendations Report*, the majority of blanket bog peatlands within the Glenshero Estate show some evidence of degradation and erosion, and pressure from grazing preventing regeneration in some areas. Most areas of peatland in Glenshero Estate are in poor ecological condition, with peat hags and severe erosion in places. In many instances these areas have been drained in the past, sometimes to facilitate forestry.

The selection process for suitable blanket bog management areas within the estate utilised the following GIS datasets:

- SNH's map of peatland in Scotland: filtered for values "blanket bog/peat veg." or "undiff. heather moor";

- SNH's Classification of peatland habitat in Scotland: *filtered for values "Class 1 or Class 2" peatland*;
- SNH's Habitat Map of Scotland: filtered for value "blanket bogs";
- James Hutton Institute map of soils in Scotland: filtered for values "blanket peat", "eroded blanket peat", "basin and valley peats";
- James Hutton Institute map of deep peat in Scotland: *filtered for values "yes" and "potential" for deep peat*; and
- Land suitability for trees in Scotland: filtered for value "Land unsuitable for trees".

Two areas of land within the Estate have been identified as search areas for management of blanket bog and wet heath, to improve the quality of habitat. The rationale for the selection of these areas is as follows:

- The two areas have been identified as deep blanket peat or basin and valley peat in the Soil Map of Scotland. In the case of Management Unit 1b, this has been specifically identified as eroded blanket peat and therefore a good candidate for significant improvement.
- The two areas are within the core foraging area (2-3km) of established golden eagle nest sites, and are predicted by the golden eagle PAT model (Confidential Figure 7.3.3) to be used regularly by the two golden eagle pairs closest to the proposed development site, thereby helping to offset any habitat losses caused by displacement around turbines, by improving habitat quality for eagle prey.
- The areas of land are greater than the minimum areas for improvement to benefit golden eagle, as specified in Whitfield *et al.* (2008). Open areas need to be large to meet both the requirements of hunting eagles and their prey and should be larger than 20 ha and over 300 m wide.
- The two areas are outside of the part of the site where turbines would be located (apart from the northern part of 1b which could be removed if management of this area was considered to present a risk), so that golden eagles are not attracted to forage in proximity to turbines by improved habitat quality.
- The areas are within, and adjacent to the Monadhliath SAC and SSSI or Creag Meagaidh SAC and SSSI thereby improving the habitat quality within, and increasing the extent of habitat associated with these designated sites, helping favourable condition to be attained.
- These areas would also be used for the relocation of grallochs from elsewhere in the Estate, particularly from within the proposed turbine areas, to aid golden eagle feeding at particular times of the year (grallochs should not be relocated into the Monadhliath SAC).

EIAR Volume 2: Chapter 6: Ecology estimates that the area of blanket bog and wet heath habitats that may be directly and indirectly affected by infrastructure is 84.4 ha. Assuming a minimum 4x compensation ratio for habitat loss, a minimum total of 337.6 ha would be identified for Habitat Management.

#### **4.2 Habitat Management Units 2a and 2b: Heather Management**

As described in the *Environmental Recommendations Report*, heath is the most common habitat in Glenshero Estate, characterised by poor or peaty soils with vegetation dominated by dwarf shrubs and

grasses, providing a low but varied canopy structure. Wet heath is the most widespread, dominated by dwarf shrub, grasses, sedges and *Sphagnum* mosses. At higher altitudes this community transitions into dry heath, characterised by greater heather coverage, and montane heath above the natural treeline, characterised by a greater proportion of grassland, willow scrub and open rock.

The selection process for identifying suitable areas for heather management within the estate used the following datasets:

- SNH's map of peatland in Scotland: filtered for values "undiff. heather moor";
- SNH's Classification of peatland habitat in Scotland: *filtered for values "null"*;
- SNH's Habitat Map of Scotland: filtered for value "dry heaths" or "wet heaths";
- James Hutton Institute soil map of Scotland: *filtered for values containing "podzol"*;
- James Hutton Institute map of deep peat in Scotland: *filtered for values "no" for deep peat*; and
- Land suitability for trees in Scotland: filtered for value "Land unsuitable for trees".

Two areas of land within the Estate have been identified as search areas for management of heather and dwarf shrubs. The rationale for the selection of these areas is as follows:

- The habitats would improve conditions for eagle key prey species such as red grouse and mountain hare, as well as for deer;
- The areas of land are greater than the minimum areas for improvement to benefit golden eagle, as specified in Whitfield *et al.* (2008);
- The two areas are within the core foraging area (2-3km) of established golden eagle nest sites, and are predicted by the golden eagle PAT model to be used regularly by two golden eagle pairs within the estate, thereby helping to offset any habitat losses caused by displacement around turbines;
- The soil types in the two areas have been identified as peaty podzols, and therefore are more suitable for dry or wet heath creation compared to areas of deeper peat or gleys;
- The two areas are outside of the site, so that golden eagles are not attracted to forage within the turbine area by improved habitat quality;
- The two areas have been identified within the wider area earmarked for future grouse shooting within the estate, and therefore habitat creation would be compatible with this future land use; and
- The two areas are at lower altitudes and would, over the long-term, provide habitat suitable for deer, thereby relieving some grazing pressure on higher slopes hosting more sensitive montane, bog and heath habitats, including those within the SSSIs.

Based on the golden eagle PAT model, the turbine area (plus 500 m displacement buffer) would result in a loss of suitable habitat for the three overlapping eagle territories. The Management Unit search areas are relatively close to territory centres compared to the proposed development site, and so the ranging probability of eagles, as predicted by the PAT, within these management units would likely be higher than that of a similarly sized area within the proposed development site.

As detailed in the impact assessment in EIAR Volume 2: Chapter 7: Ornithology, the likelihood of an eagle territory being significantly affected by displacement is based on the quality of the habitat, and the quality of the breeding pair found within. Territory P has only been occupied recently by an inexperienced pair, and has lower productivity than surrounding territories. This territory is therefore the focus of habitat management to increase the quality of the habitat available within, and reduce the risk of territory abandonment. Management Unit 2b (as well as 1a) would be suitable for this.

A minimum of 150 ha for each Management Unit would be selected for suitable management.

#### **4.3 Habitat Management Units 3a and 3b: Native Woodland Creation**

As described in the *Environmental Recommendations Report*, there are several small areas of native woodland in the estate, though historically woodland would have been more widespread. At present, natural regeneration of woodland is restricted by grazing pressure from deer and sheep. Current deer densities of approximately 16 deer per km<sup>2</sup> are more than triple the recommended level for natural woodland regeneration (five deer per km<sup>2</sup>). As such, existing areas of high quality native woodland have required intervention or planting to encourage regeneration and expansion. Commercial conifer woodland located mainly in the central glen at lower altitudes was established between the 1950s and 1970s.

The selection process for identifying suitable areas for native woodland within the estate used the following datasets:

- SNH's map of peatland in Scotland: filtered for values "undiff. broadleaf", "Coniferous (plantation)" and where not "blanket bog/peat veg";
- SNH's Classification of peatland habitat in Scotland: *filtered for "null" value*;
- SNH's Habitat Map of Scotland: filtered for values "Broadleaved deciduous woodland", "Caledonian forest", "Highly artificial coniferous plantation", "Lines of trees" or "Woodland, forest or other wooded land" and where not "blanket bog";
- James Hutton Institute map of peatland in Scotland: filtered for values where no "blanket peat", "basin and valley peats", "eroded blanket peat";
- James Hutton Institute map of deep peat in Scotland: *filtered for "null" values for deep peat*; and
- Land suitability for trees in Scotland: where "limited" or "very limited" flexibility for trees (no higher suitability categories within Glenshero Estate).

Two areas of land within the Estate have been identified as search areas for creation of native woodland. The rationale for the selection of these areas is as follows:

- The areas have been identified in the *Environmental Recommendations Report* as a target area suitable for hillslope and riparian woodland;
- The areas are outside of the core foraging range of any golden eagle nest sites. Haworth & Fielding (2013) advise that up to 2–3 km from the nest should be avoided by woodland expansion projects;
- The woodland areas are at lower altitude than the likely preferred habitat for golden eagle, and avoids the uppermost parts of ridges;

- The areas avoid deep peat;
- The areas take into consideration existing woodland, that planned in the Glenshero Estate Forest Plan, to enhance connectivity for species such as black grouse and wildcat, as well as deer; and
- The areas would relieve some grazing pressure on more sensitive higher altitude habitats as deer would utilise the woodland for shelter once sufficiently mature, particularly during the winter.

A minimum of 120 ha for each Management Unit would be selected for suitable management. Any woodland expansion in Unit 3a that would overlap with the extent of the Monadhliath SAC/SSSI would need to ensure compatibility with Monadhliath SAC/SSSI conservation objectives and management statement.

#### **4.4 Habitat Management Units 4a and 4b: Wind Farm Area**

The turbine areas plus a 500 m buffer comprise Habitat Management Units 4a and 4b. The following requirements are prescribed for these Habitat Management Units:

- Removal of deer grallochs within 500 m of turbines and relocation into Management Units 1a and 1b (but avoiding the Monadhliath SAC).

### **5 AIMS, OBJECTIVES AND MANAGEMENT PRESCRIPTIONS**

For each Management Unit, the associated Aims define the general OHMP goals, and the related Objectives further define the Aims into quantifiable targets. The Prescriptions detail the management works to be implemented to achieve these Aims and Objectives. Annex 1 provides an indicative timetable for the implementation of the various prescriptions.

#### **5.1 Management Units 1a and 1b – Blanket Bog**

**Aim 1: Restore and enhance the blanket bog resource.**

Objective 1.1)	Increase the abundance and distribution of <i>Sphagnum</i> mosses, particularly key indicator species such as <i>Sphagnum papillosum</i> and <i>S. magellanicum</i> .
Objective 1.2)	Increase the abundance of dwarf shrubs including <i>Calluna vulgaris</i> , <i>Empetrum nigrum</i> and <i>Vaccinium myrtillus</i> .
Prescription 1.1)	Dam active drains in order that the water level is raised sufficiently to create conditions suitable for the <i>Sphagnum</i> species mentioned within Objective 1.1.
Prescription 1.2)	The following activities would be prohibited within Management Units 1a and 1b: <ul style="list-style-type: none"> <li>• Clearing out of existing ditches;</li> <li>• Application of any insecticides, fungicides or molluscicides;</li> <li>• Application of lime or any other substance to alter the soil acidity;</li> <li>• Cutting or topping vegetation except to control injurious weed species;</li> <li>• Burning of vegetation or other materials;</li> <li>• Use of roll or chain-harrow;</li> </ul>

- Planting trees;
- Carrying out any earth moving activities;
- Use for off-road vehicle activities;
- Construction of tracks, roads, yards, hardstandings or any new structures;  
or
- Storage of materials or machinery.

Prescription 1.3) Manage grazing pressure within Management Units 1a and 1b, as required, to achieve Objective 1.2. This could involve the need for some deer fencing and/or a reduction in deer densities. Deer densities are considered to be high on peatland if they exceed a density of ~15 deer/km<sup>2</sup> (Cummins *et al.* 2011<sup>2</sup>) and a density of below 10-15 deer/km<sup>2</sup> should be aimed for. Deer densities would be managed in accordance with the SDMP and the Glenshero Wind Farm Deer Management Plan (EIAR Volume 4: Technical Appendix 6.7), which would be finalised prior to construction. Ongoing deer management already takes place on the site and it is anticipated that this would be amended as required to tie in with the SDMP and the Glenshero Wind Farm Deer Management Plan.

## 5.2 Management Units 2a and 2b - Heather Management

### Aim 2: Enhance golden eagle foraging habitat.

Objective 2.1) Increase the abundance and diversity of dwarf shrubs including *Calluna vulgaris*, *Empetrum nigrum* and *Vaccinium myrtillus* in mid-altitude wet and dry heath habitats within Glenshero Estate.

Objective 2.2) Increase the abundance of golden eagle prey species such as red grouse and mountain hare.

Prescription 2.1) Manage grazing pressure within Management Units 2a and 2b, as required, to achieve Objective 2.1. This may involve the need for some deer fencing and/or a reduction in deer densities of around 7-8 deer/km<sup>2</sup> (Putman *et al.* 2011<sup>3</sup>). Deer densities would be managed in accordance with the SDMP and the Glenshero Wind Farm Deer Management Plan (EIAR Volume 4: Technical Appendix 6.7), which would be finalised prior to construction. Ongoing deer management already takes place on the site and it is anticipated that this would be amended as required to tie in with this aim.

Prescription 2.2) Design and implement a heather management plan to optimise the structure diversity of the habitat for golden eagle prey in Management Units 2a and 2b. This may involve cutting and/or burning.

Prescription 2.3) Implement an annual programme of muirburn/cutting within dry and wet heath habitats within Management Units 2a and 2b. Limited cutting may also

<sup>2</sup> Cummins, R., Donnelly, D., Nolan, A., Towers, W., Chapman, S., Grieve, I. and Birnie, R.V. (2011). Peat erosion and the management of peatland habitats. Scottish Natural Heritage Commissioned Report No. 410.

<sup>3</sup>[http://www.parliament.scot/S5\\_Environment/Meeting%20Papers/Mammal\\_Review\\_173\\_Threshold-densities.pdf](http://www.parliament.scot/S5_Environment/Meeting%20Papers/Mammal_Review_173_Threshold-densities.pdf)

be permitted in some blanket bog areas where this does not impact upon the integrity of the bog. This would be subject to an ongoing monitoring programme.

Prescription 2.4) No mountain hare culls would take place within Management Units 2a and 2b.

### **5.3 Management Units 3a and 3b – Native Woodland Creation**

**Aim 3: Increase native woodland coverage.**

**Aim 4: Reduce deer grazing pressure on blanket bog and montane, wet and dry heaths.**

Objective 3.1) Increase the abundance of native broadleaved woodland within Glenshero Estate.

Objective 3.2) Make an increased area of native broadleaved woodland available to deer for shelter over the long-term.

Prescription 3.1) Plant low density native woodland to increase tree cover. Tree planting within Management Units 3a and 3b would occur in densities of 1,100 stems per ha. The exact species mix would depend on local conditions, but may comprise: common willow, downy birch, rowan and Scots pine. Tree planting should be undertaken during the first year of construction and be completed by the first year after final commissioning of the proposed development.

Prescription 3.2) Deer fencing may be required around coupes to prevent damage. If so, fencing would be made more visible to grouse by the use of chestnut paling, sawn softwood droppers, or orange plastic netting (see Trout and Kortland, 2012<sup>4</sup> for example). The fences would be removed as soon as practicably possible to allow deer to access the woodland.

Prescription 3.3) Manage deer densities within Management Units 3a and 3b, as required, to achieve Objective 3.2. This could involve the need for a reduction in deer densities to 5 deer/km<sup>2</sup> in areas of planted woodland until considered sufficiently mature to avoid damage.

### **5.4 Management Units 4a and 4b – Wind Farm Area**

**Aim 5: Reduce golden eagle collision risk.**

Objective 4.1) Reduce the number of deer carcasses and grallochs within the proposed turbine areas (as shown on EIAR Volume 3: Figure 6.12).

Objective 4.2) Provide supplementary feeding for breeding golden eagle.

Prescription 4.1) Regularly check for and remove any deer carcasses within the wind farm area to prevent golden eagles being attracted to forage close to operational wind turbines.

Prescription 4.2) Relocate any deer carcasses and grallochs found within areas of turbines plus a 500m buffer to suitable locations within core foraging areas for pairs in the

<sup>4</sup> Trout, R. and Kortland, K. (2012). Fence marking to reduce grouse collisions. Forestry Commission Technical Note. [http://www.forestry.gov.uk/PDF/FCTN019.pdf/\\$FILE/FCTN019.pdf](http://www.forestry.gov.uk/PDF/FCTN019.pdf/$FILE/FCTN019.pdf)



Glenshero Estate (within 2 km of nest sites). This would be particularly important during winter months.

## 6 MONITORING

Habitat monitoring, conducted by suitably qualified and experienced ecologists, would evaluate the success of restoration and enhancement of blanket bog and associated peatland habitats from over-grazing and drainage. This would be achieved by recording changes to the structure and composition of the vegetation and species abundance, evenness and diversity. A representative sample of permanent quadrats would be established within Management Units 1a and 1b to gather sufficient data to inform future management and assess the trajectory of plant species and habitats.

Habitat monitoring to measure the condition of heather and other dwarf shrubs would take place within Management Units 2a and 2b. Surveys would monitor changes in the structural diversity of dwarf shrub heath and assess the grazing pressure on any burnt/cut areas to ensure adequate regeneration occurs.

Habitat monitoring would commence during the first year of operation of the proposed development to establish the baseline and at present, it is planned that monitoring would be repeated in years 5, 10, 15, 20 and 25 of the operational life of the proposed development. The requirement for the longer-term monitoring would be subject to review of results and agreement with consultees.

For Management Units 3a and 3b, annual native woodland establishment monitoring for the first 5 years after planting would take place.

The final detailed methods for all monitoring would be agreed with The Highland Council, and SNH if required.

Breeding wader surveys (following standard methodologies) would be undertaken in the first three years during the operational life of the proposed development, both within the proposed development site and Management Units 1 and 2. Further monitoring could be required in years 5, 10 and 15, depending on the outcome of these surveys and agreement with consultees. The main objectives of this monitoring would be to assess the status of breeding waders in the vicinity of the proposed development site and to establish whether the habitat management within Management Units 1 and 2 have resulted in an increase in breeding wader territories.

Breeding golden eagle surveys would be undertaken annually during the operational period of the proposed development (for at least the first five years, followed by an assessment of further monitoring requirements and agreement with consultees) to assess the success of the habitat management measures and provide data for the Regional Golden Eagle Management Plan for Natural Heritage Zone 10.

Reports would be submitted to The Highland Council (and SNH if required) in years 1, 2, 3 and 5, and in years 10 and 15 if monitoring is ongoing. The reports would detail management works completed to date and the results of the habitat and bird surveys. The works proposed over the next reporting period would also be discussed.

It should be noted that the OHMP is a live document, and could require alteration based on the findings from the monitoring programme, unexpected events or evolving guidance. A formal review of the HMP would take place every five years, upon which time changes to the scope of the monitoring programme may be considered, subject to results of monitoring. Any proposed amendments would be put to The Highland Council (and SNH if required) for approval, before implementation. The implementation of the OHMP would also take account of the existing land management practices



across the site, which would continue during construction and operation. The OHMP would need to work in tandem with these existing land uses.

**ANNEX 1 MANAGEMENT AND MONITORING TIMETABLE**

Activity	Year - 1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15...
Drain Blocking, bog management (Units 1a and 1b)	✓														
Tree planting (Units 3a and 3b)	✓														
Fencing (if required for implementation of management; all Management Units)	✓														
Burning or cutting of selected areas within Management Units 2a and 2b	Continues for 30 years														
Deer Management (all Management Units)	Continues for 30 years														
Habitat Monitoring (All Management Units)	✓				✓					✓					✓
Breeding Wader Surveys	✓	✓	✓		✓					✓					✓
Golden eagle Surveys	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reporting The Highland Council, SNH	✓	✓	✓		✓					✓					✓