SEI Appendix 8.5: Outline Restoration and Enhancement Plan (OREP): Peat, Biodiversity, Landscape and Forestry

Loch Liath Wind Farm Limited

Loch Liath Wind Farm SEI Report

SEI Appendix 8.5: Outline Restoration and Enhancement Plan (OREP): Peat, Biodiversity, Landscape and Forestry

Final report
Prepared by LUC
October 2024

Loch Liath Wind Farm Limited

Loch Liath Wind Farm SEI Report
SEI Appendix 8.5: Outline Restoration and Enhancement Plan (OREP): Peat, Biodiversity, Landscape and Forestry

Project Number
13072

Version	Status	Prepared	Checked	Approved	Date
1.	Final	LUC	LUC	LUC	28.04.2023
2.	Updated for SEI	LUC	LUC	LUC	25.10.2024

Bristol
Cardiff
Edinburgh
Glasgow
London
Manchester
Sheffield

landuse.co.uk

Land Use Consultants Ltd
Registered in England
Registered number 2549296
Registered office:
250 Waterloo Road
London SE1 8RD

100% recycled paper

Landscape Design
Strategic Planning & Assessment
Development Planning
Urban Design & Masterplanning
Environmental Impact Assessment
Landscape Planning & Assessment
Landscape Management
Ecology
Historic Environment
GIS & Visualisation
Transport & Movement Planning
Arboriculture

FS566056
EMS566057
OHS627041

Contents

Introduction

1.1 This document provides an outline of proposed peat resource, habitat and landscape restoration and management measures related to the proposed Loch Liath Wind Farm (hereafter referred to as 'the Proposed Development'). The document has taken a holistic approach to habitat, peat, landscape, and forestry management:

- Proposed interventions have been identified collectively by the ecology, ornithology, landscape and visual, and peat specialists within the EIA team to ensure maximisation of environmental benefits and avoid conflict between environmental topics.
- As some of the proposed management measures relate both to peatland habitats and the Site's peat resource, preparation of this document has been coordinated with the preparation of the Outline Peat Management Plan (OPMP) presented as **Appendix 7.3** of the 2023 EIA Report and **SEI Appendix D Additional Potential Restoration Areas** of this SEI Report.

1.2 This document sets out outline proposals only; in accordance with standard practice, it is intended that the outline proposals are used as a basis for a detailed management plan, to be agreed under a condition attached to any consent granted to the Proposed Development, in consultation with NatureScot, The Highland Council, SEPA, and other relevant stakeholders.

Overall Objective of the Management Plan

1.3 The overall objective of this outline plan is to provide a holistic framework for the enhancement of the Site with respect to biodiversity, peat resource, forestry and landscape, over and above mitigation of the Proposed Development's predicted effects and taking appropriate account of the Site's environmental characteristics and potential for enhancement as identified through the EIA process. This plan also recognises the requirement of National Planning Framework 4 (NPF4) Policy 3 that "*development proposals will contribute to the enhancement of biodiversity, including where relevant, restoring degraded habitats*".

1.4 Once finalised, in consultation with The Highland Council, NatureScot, SEPA and additional relevant stakeholders, the measures outlined within this document and implemented over the lifetime of the Proposed Development will conserve, restore and enhance the peat resource and peatland, woodland and riparian habitats within the Site in a manner which would not be possible without intervention. This will allow a variety of interconnected benefits to be realised including avoidance of greenhouse gas emissions, expansion of carbon sinks, enhancements in upland biodiversity and improvements to water quality. The final plan will include a monitoring and review framework to track and report on the efficacy of management measures, allowing interventions to be adapted to emerging evidence and specialist advice and ensure net benefits are realised over the lifetime of the Proposed Development.

Showing an area of degrading peat within the Site

Baseline Conditions: Key Management Considerations and Opportunities

Non-Avian Ecology

1.5 As noted in **Chapter 8** of the 2023 EIA Report and associated appendices, the area of the Site where turbines and ancillary infrastructure is located has a complex habitat composition due to its topography, and supports a range of habitats of conservation interest, including priority heathland and bog habitats.

1.6 Peatland condition across the Site is variable, with large extents of peatland habitats showing a degree of modification due to grazing, with smaller pockets of erosion. Grazing has affected the habitat composition, resulting in extensive areas of peatland habitat within the Site being in 'modified' condition.

1.7 The network of watercourses within the Site was found to offer potential water vole habitat, with a number of active colonies recorded. Populations of this species in the uplands are naturally fragmented and reflect the distribution of scattered patches of suitable habitat. Particularly favourable habitat was recorded along stretches of slow-moving water in the south-west of the Site, notably along tributaries of the Allt Seanabhaile in the north.

1.8 In addition, otter were confirmed to be present through footage captured on a camera trap deployed within the Site, and are likely to make use of the network of watercourses and waterbodies, although no resting sites were recorded.

1.9 Prior to mitigation and enhancement, the Proposed Development has not been predicted to have any significant effects under the EIA regulations with respect to non-avian ecological interests.

A view of the water vole burrows identified within the Site.

Showing a mosaic between M25 Molinia caerulea-Potentilla erecta mire and H12 Calluna vulgaris-Vaccinium myrtillus heath to the north-west of Site

Ornithology

1.10 There are no statutory designated sites with ornithological interest within or adjacent to the Site, although the Site does form part of a non-qualifying golden eagle territory. White-tailed eagle flights were recorded during surveys undertaken for the Proposed Development, with the majority of observations made during the non-breeding season. Hen harrier and merlin were observed irregularly during the study period, although there was no evidence of breeding despite extensive searches in potential breeding habitat. The Site currently supports a typical assemblage of moorland birds. Red-throated diver and Slavonian grebe were encountered in the wider survey area during the baseline surveys for the Proposed Development and were confirmed to have attempted to breed. The Proposed Development is not predicted to have significant effects upon any bird species.

1.11 The key objective for any habitat management measures at the Site is to provide improved nesting and foraging opportunities for moorland bird species through peat resource restoration and interventions relating to specific species (including ground nesting waders, raptors and red-throated diver) away from development infrastructure.

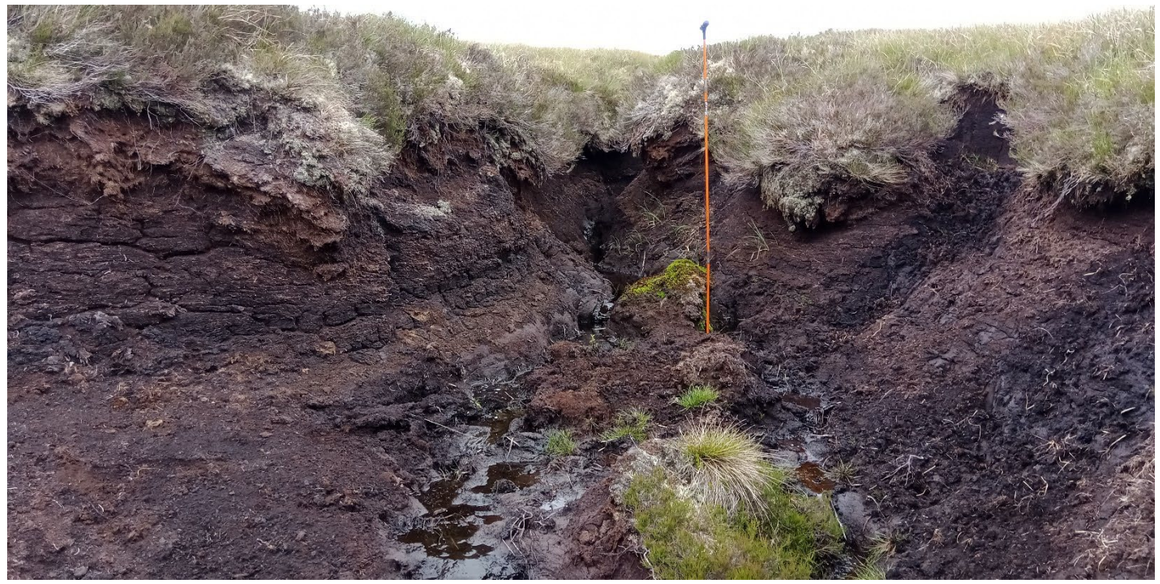
1.12 As detailed in **Chapter 9** of the 2023 EIA Report, the layout of the Proposed Development has been designed to maintain access for red-throated diver to feed at larger lochs, and to maintain a suitable buffer from waterbodies used by red-throated diver or Slavonian grebe, black grouse lek sites, and golden eagle breeding sites.

Peat Resource

1.13 As noted in **Chapters 3** and **7** of the 2023 EIA Report, and the OPMP (**Appendix 7.3** of the 2023 EIA Report), the Proposed Development has been designed to minimise impacts on the Site's peat resource, commensurate with the need to take into account other environmental effects and technical design constraints. However, about 55% of the Site is covered in peat (as per **Section 4.4, Appendix 7.2 Peat Survey Report** of the 2023 EIA Report), and as such it has not been possible to avoid peat altogether. Prior to mitigation and enhancement, some elements of the infrastructure have been predicted to have a Moderate effect upon the Site's peat resource and therefore require mitigation through the appropriate reuse of peat excavated for construction of the Proposed Development (see **Appendix 7.3** of the 2023 EIA Report).

1.14 Within the Site boundary, a number of areas in the vicinity of the infrastructure have been identified as appropriate for placement of excavated peat to restore the peat levels, reduce any further erosion and allow groundwater to rise, improving the adjacent peat quality. In addition, the Site offers further opportunities for peat resource enhancement via restoration of other currently eroded areas of peat. Details are provided in **Appendix 7.3** of the 2023 EIA Report and **Appendix D** of the SEI Report.

1.15 Degraded parts of the Site are visible as bare peat, either as a network of eroded channels or wider areas that are spreading through erosion at the margins. This is an evolution of peat erosion where thin channels erode downwards and sideways to form hags which then spread further to merge, becoming larger areas of eroded peat. Once bare peat is exposed, the process accelerates, as wind, frost, sun and rain all start the gradual removal of bare peat. The groundwater levels are also reduced in the adjacent peat due to the creation of a channel which further promotes erosion, dries out the adjacent peat and makes it easier to be removed by weathering processes and promotes slumping. Damming the channels to increase water levels, backfilling the voids with peat with intact acrotelm, and reprofiling the slopes with vegetated layers of peat can all help to reverse these effects.



Showing a peat hag within the site

Landscape and Visual

1.16 The key current characteristic of the Site in landscape and visual terms with implications for this OREP is the 'scarring' associated with hagged/eroded peat, which is a visual detractor. The diversity of vegetation cover across the Site is also limited, principally as a consequence of current and historic grazing pressures from deer and occasional livestock.

1.17 Due to the challenging terrain and upland nature of the Site, defined by the Rocky Moorland Plateau – Inverness Landscape Character Type (LCT 222), public access across the Site is limited although views into the interior of the Site are possible from surrounding elevated areas and nearby hill summits, such as Meall Fuar-mhonaidh. Although outside the Site, measures to restore and enhance access to this popular local hill summit are proposed by the Applicant, as outlined in **Appendix 13.1 Outline Access Management Plan** of the 2023 EIA Report.

Land Use Considerations and Habitat Management Area

1.18 The Site and its surroundings are in longstanding active use for sporting interests with limited numbers of livestock. The proposals set out in this OREP need to achieve environmental enhancement whilst allowing these land uses to continue across the estate, as these uses are fundamental to the estate's future management. This balance has been achieved through detailed discussions with the landowner, taking into consideration a range of constraints, and the resultant identification of the area within which peatland restoration is deliverable (see **SEI Figure 1**, **SEI Figure 2**, and **SEI Figure 8.9** of the SEI Report.

Proposed Habitat Restoration and Management Measures

1.19 The areas in and around the Site to which the following proposals relate are illustrated in each case in **SEI Figure 8.9** of the SEI Report.

Governance and Implementation

1.20 Given the number of interested parties involved, and that this OREP proposes interventions over quite extensive areas, it is proposed that the final Restoration and Enhancement Plan is delivered by a Restoration and Enhancement Steering Group (RESG). Members of the group are likely to include:

- the Applicant;
- the landowner (or their agent/s);
- a principal contractor (when appointed);
- a restoration contractor (when appointed); and
- various members of an appointed environmental consultant team.

1.21 Other parties would be engaged or consulted with as required on specific interventions.

Peatland Restoration and Enhancement

Peat Resource Restoration

1.22 Various areas have been identified in and around the Site (**SEI Appendix D** and **SEI Figure 8.9** of the SEI Report, and **Appendix 7.3** of the 2023 EIA Report) with the potential to be restored using a range of techniques as summarised below. Techniques proposed include repair using excavated peat, re-profiling using machine-based techniques, and hand techniques with helicoptered material.

1.23 Areas of restoration will likely require some level of hydrological control to avoid peat slumping, sliding or erosion. Where restoration areas are located adjacent to the Proposed Development infrastructure components, these can act as dams to retain reinstated peat. Where this is not the case, hydrological control may be through the installation of damming structures or by appropriate profiling.

1.24 Hydrological control through the installation of damming structures in eroded areas, combined with reprofiling, allows the main factors causing peat erosion - flowing water and the exposure of bare peat to weathering by rain, sun, wind and frost - to be managed. Dams slow water flow, allow the adjacent peat to be re-wetted through the raised water levels, prevent the exposure of bare peat if water levels are maintained, and offer a suitable environment for peat forming vegetation. Reprofiling uses adjacent peatland habitat to be translocated to cover bare peat and prevent the continual gradual removal of peat through weathering.

Repair of Eroded / Bare Areas using Excavated Peat

1.25 Areas have been identified comprising eroded / bare peat that are in close proximity to the Proposed Development infrastructure. These will be repaired using translocated acrotelmic and catotelmic peat to be excavated during construction. These areas will be backfilled with the best quality peat that is excavated for the construction of the Proposed Development. The process will occur concurrently so that the peat is stored for the minimum amount of time possible prior to reinstatement, with direct translocation preferred. This enables the peat integrity to be maintained and offers the greatest chance of success of habitat restoration.

1.26 An experienced restoration contractor would be required to work on site concurrently with construction. When peat is available from construction, this will be placed in eroded areas and bunds will be constructed (in the steeper eroded areas) to help retain the basal catotelmic peat. This method is proposed to be used on the 16 areas previously identified (**Appendix 7.3** of the 2023 EIA Report), in combination with machine-based Peatland ACTION techniques to improve the conditions surrounding the translocated peat and promote recovery of peatland vegetation.

Showing a peat hagg and bare peat within the Site

Repair of Eroded / Bare Areas using Machine-Based Peatland ACTION Techniques

1.27 Areas of eroded / bare peat that are located away from the infrastructure, but which have been assessed to be accessible by plant, will be restored using machine-based techniques. This includes conventional hagg and gully reprofiling techniques where gullies or hagg sidewalls are bare over a sufficiently large area to merit reprofiling and where accessible by plant. Where gully floors are sufficiently wide that reprofiling will not achieve full vegetation cover and where the floors are subject to focused water flow, flow management will be undertaken through the use of surface bunds.

Repair of Eroded / Bare Areas using Hand Techniques and Helicoptered Materials

1.28 Areas have been identified comprising eroded / bare peat that are not considered to be accessible by plant. In these cases, the restoration applied may involve a mulch layer with overlying textiles pegged. The source of the mulch will be determined based on the accessibility of the location to Argocats, and locations will also be assessed for exposure and growing season length and therefore any requirement for more resistant textiles.

1.29 Where exposure to wind and/or freeze-thaw is considered a limiting factor, flow management will be utilised to slow the flow of water, limit erosion and provide a more stable substrate for recolonisation of vegetation. Where access is very limited or restoration footprints are small, peat-filled geotextile sacks will be utilised for flow management. Larger gullies with only small watercourses will be restored using coir rolls pegged into the peaty floor of each gully, or timber dams if accessible by Argocat. Very large gullies with active eroding channels (up to 2 m wide) will be restored using stone dams constructed using helicoptered bags of stone.

Ecological Enhancement

Tree Planting

1.30 Although no compensatory tree planting is required as no felling will be undertaken, tree planting is proposed as an enhancement to the Site, as per Policy 3 of NPF4. Tree planting is proposed to comprise both riparian and non-riparian planting. Planting will comprise a combination of continuous and discontinuous shrub and tree-dominated planting. Native tree species appropriate for the Site will be agreed post-consent, but may include the following:

- Alder *Alnus glutinosa*;
- Aspen *Populus tremula*;
- Downy birch *Betula pubescens*;
- Eared willow *Salix aurita*;
- Grey willow *Salix cinerea*;
- Hawthorn *Crataefus monogyna*;
- Juniper *Juniperus communis*;
- Rowan *Sorbus aucuparia*;
- Scots pine *Pinus sylvestris*; and
- Sessile oak *Quercus petraea*.

1.31 Discontinuous areas of planting will ensure that extensive shading of existing food plants (e.g. grasses and bilberry) does not occur, with planted tree and shrub species being carefully selected and located.

1.32 During the establishment phase, trees will be protected in accordance with best practice guidance available at the time of planting, with the requirement for fencing being avoided in so far as possible. Grazing management would be the preference in the first instance if beating-up indicates an issue with browsing on young trees. Biodegradable tree shelters will also be considered.

1.33 Monitoring will be undertaken regularly to ensure planting is successful and does not become a shelter for deer.

Riparian Tree Planting

1.34 Riparian planting will aim to establish small groups of native trees along the riparian corridors of the Allt Seanabhaile within the Site, to enhance biodiversity and watercourse quality and promote the connectivity of habitat features.

1.35 Small groups of native tree species are proposed to be planted along the riparian corridor to provide cover which will extend into the Site. The detailed planting scheme will take into account peat depth (no planting should take place on peat >0.5 m), and potential water vole habitat. Typically, planting would favour the drier hummocks as trees will grow more successfully in the drier areas. Suitable species include alder, aspen, willows, and rowan.

1.36 Best practice guidance for riparian planting will be followed[1], with planting groups expected to be 5-10 m wide and 10-20 m long, depending on the width of the watercourse, speed of flow, and extent of habitat considered to be suitable for planting.

1.37 The search area is approximately 15 ha and a target of 5 ha riparian planting within this area is proposed (as shown on **SEI Figure 8.9** of the SEI Report), although achieving this target this will be dependent on identifying sufficient suitable habitat at the stage at which detailed planting proposals are drawn up (post-consent).

A view of the Allt Seanabhaile – where the riparian scrub planting search area is proposed

Non-Riparian Tree Planting

1.38 A search area for additional, non-riparian tree planting has been identified (the mixed native woodland planting search area shown in **SEI Figure 8.9** of the SEI Report). The detail of planting within this area would be agreed post-consent in consultation with relevant statutory consultees, and would be based upon the following principles:

- Planting will be undertaken in small and/or linear groups rather than larger woodland blocks. Planting density will vary, with relatively closer spacing on lower and more sheltered ground (e.g. close to the existing Shewglie Wood), and wider spacing on higher ground.
- Native species will be selected, for example rowan, downy birch, willow species, aspen, Scots pine (note that the Site is outwith the Caledonian Pinewood Inventory buffer). Sessile oak, hazel and holly may be suitable on relatively lower ground.
- Planting will avoid the most sensitive habitats with respect to peatland (e.g. avoiding peat >0.5 m depth), and will typically favour drier hummocks, as trees will grow more successfully in drier conditions.

[1] The Woodland Trust (2016) Keeping Rivers Cool: A Guidance Manual. Creating riparian shade for climate change adaptation. Available at: https://www.woodlandtrust.org.uk/media/1761/keeping-rivers-cool.pdf [Accessed February 2023]

1.39 Within the non-riparian tree-planting search area, it is estimated that approximately 100 ha comprises peat up to 0.5 m deep. It is therefore recommended that a minimum 30 ha is targeted for non-riparian tree planting (as shown on **SEI Figure 8.9** of the SEI Report), with stocking density varying from 500 up to 1600 stems per hectare.

1.40 Juniper translocation and/or cultivation will be considered in line with the measures outlined with regards to montane scrub planting (see below).

Montane Scrub Planting

1.41 Montane scrub will be planted, comprising species such as dwarf birch and montane willows. The planting of montane scrub will be undertaken within a search area of 100 m from infrastructure at suitable altitude and will avoid areas of deep peat (>0.5 m) (as shown on **SEI Figure 8.9** of the SEI Report). Planting will also avoid potential or confirmed water vole habitat.

1.42 The search area is approximately 200 ha. However, any montane scrub planting at the elevation of the scheme would be expected to be at very low density. In addition, the planting potential is dependent on sufficient suitable habitat being available (avoiding areas of deep peat for example).

1.43 The Site supports an existing population of juniper. Forestry Commission Scotland (FCS) published a strategy for juniper which was based on three zones with a recommended conservation approach for each zone[2]. The Site is within Zone 1 in which there are self-sustaining juniper populations; as such, FCS recommends that planting will rarely be required, although some conservation management may be beneficial to promote natural regeneration. Planting juniper from outside sources would risk introducing a largely soil-borne pathogen (*Phytophthora austrocedrae*) to the Site. The detailed distribution and health of the juniper population within the Site will be assessed post-consent. If the population appears to be small and isolated, with limited natural regeneration, potential conservation management options will be explored post-consent. This may include, for example, translocation within the Site, collection of cones and onsite cultivation of seedlings for planting out to strengthen the existing population, or grazing management. Consideration will be given to planting juniper from nursery sources as a last resort, and only where agreed with NatureScot.

Grazing Management

1.44 Grazing densities have been assessed in line with established guidance[3]. The latest deer count was 9.8 deer per square km[4], and the last two Herbivore Impact Assessments (HIA) were “low to medium” [4,5]. This equates to approximately 0.025 LU/ha/yr[3,6]. Cattle (19 cows and calves) are reported by Balmacaan Estate to graze a minimum of 4000 ha for 5 months of the year (June to October inclusive); this equates to 0.002 LU/ha/yr[3,6]. The combined grazing density for deer and cattle is therefore estimated at 0.027 LU/ha/yr. This figure is below the maximum density recommended for sensitive habitats such as blanket bog.

1.45 The Applicant will work in conjunction with the Estate and their commitments within the Balmacaan Biodiversity Management Plan (or as otherwise named), where required, to promote the success of peatland habitat restoration proposals and protect riparian and mixed woodland planting. In addition, the Applicant will work in conjunction with the Estate and their commitments as part of the Glenmoriston Deer Management Group. Both the tree planting and peatland restoration measures outlined in this OREP will, however, be monitored with regards to herbivore impacts, and should areas of concern be identified, additional interventions may be required to promote their success (for example, tree shelters or fencing). Elements of fencing may be proposed in the final Restoration and Enhancement Plan in any case to protect areas of peatland restoration, particularly from poaching by deer. If areas of the Site are fenced off to exclude grazing pressure, vegetation monitoring will be undertaken both within and outwith fenced areas to assess and compare the condition of each, and to identify if any remedial action is required (for example if habitats along a fence are becoming excessively poached).

Water Vole Monitoring

1.46 A monitoring regime is proposed to establish current occupied water vole habitat and unoccupied but suitable habitat on key watercourses within the Site (e.g. the Allt Seanabhaile, River Coiltie, and tributaries). Proposed details will be confirmed post-consent.

1.47 Establishment of a mink raft or rafts and regular monitoring are proposed to act as a preventative measure with respect to water vole predation. Engagement with the Mink Control Project (MCP) would be beneficial in relation to this intervention, as rafts are present in Glen Urquhart and additional locations could be planned to complement these. The possibility that the Site could contribute to the MCP will be explored further prior to the detailed monitoring regime being agreed post-consent.

Enhancement of Habitat for Bird Species

Provision of Diver Rafts

1.48 The objectives for red-throated diver breeding enhancements are to provide additional nesting sites for red-throated diver to improve productivity. Three artificial diver rafts will be deployed on lochs with no natural islands and at distances greater than 1 km away from the turbines as an enhancement in addition to the one diver raft to be deployed for embedded mitigation.

Golden Eagle: Conservation Management Plan

1.49 There are no predicted significant effects on golden eagle as a result of the Proposed Development and, as noted below, tree planting and peatland restoration at the Site will provide additional cover, food resource and breeding opportunities for prey species of golden eagle. However, further enhancement measures are proposed which will aim to support population growth across Natural Heritage Zone (NHZ) 7. A Regional Eagle Conservation Management Plan (RECMP) approach will be adopted, based on the model implemented successfully in NHZ 10. It is considered that a regional approach is preferable to a local/estate-based one and will likely deliver a clear and demonstrable conservation gain for the species. The proposed site-specific habitat measures, coupled with on-going monitoring of the breeding status of the local golden eagle territories, will contribute to the aims of the RECMP. An Outline RECMP is provided as **Appendix 9.5** of the 2023 EIA Report.

Monitoring

Vegetation Monitoring

1.50 As outlined above, the efficacy of peatland restoration measures and ongoing grazing management will be subject to monitoring. Monitoring is likely to be resource-intensive in initial years, while the success of implementation will require close attention. The monitoring programme will ensure that appropriate mechanisms are in place to remediate any failed measure, or implement necessary management, throughout the operational lifetime of the Proposed Development.

1.51 Details of the monitoring will be confirmed post-consent; however, such monitoring will make use of published methodologies[7] and is anticipated to include measures such as:

- fixed point photography at key locations of restoration;
- quadrats at sample locations within restored areas, including, for example, assessment of the extent of vegetation cover, NVC community, and extent of bare peat;
- assessment of signs of grazing activity at sample plots; and
- control plots both within and outwith fenced areas, in locations that have not required restoration.

1.52 Monitoring will record trends in the condition, distribution and abundance of dwarf shrubs including heather (and including recording signs of heather beetle if present). The abundance and distribution of other key bog species will also be recorded (e.g. *Eriophorum vaginatum*, *Sphagnum papillosum*, *Sphagnum medium*).

Tree Planting Monitoring

1.53 Areas of planted trees will be monitored in the initial 3 years after planting, and any failed trees will be replaced. Subsequent monitoring will be undertaken to ensure the trees remain healthy, and to check for any issues with regards to disease or grazing. Details of the regime will be agreed post-consent.

[2] Forestry Commission Scotland (2013) Planting juniper in Scotland: reducing the risk from *Phytophthora austrocedrae*. Available online: https://forestry.gov.scot/publications/83-planting-juniper-in-scotland-reducing-the-risk-from-phytophthora-austrocedrae [Accessed March 2023].
[3] SAC (2007) Technical Note 586: Conservation Grazing of Semi-natural Habitats. Available online: https://www.sruc.ac.uk/media/ic3dqglq/tn586-conservation.pdf [Accessed March 2023].
[4] Balmacaan Estate, personal communication (2022)
[5] Best Practice Guidance (2018) Habitat Impact Assessment. Available online: https://bestpracticeguides.org.uk/impacts/ [Accessed April 2023].
[6] LU/ha/yr: Livestock units per hectare per year. Livestock units (LU) are used to allow a comparison of the nutritional requirements of different grazing animals. Grazing density is expressed according to the area (ha) over which the animals graze. It is then adjusted to give an overall annual grazing density by taking account of seasonal variation in grazing and expressing the rate across the period of a year.
[7] For example, Macdonald *et al*. (2007) A Guide to Upland Habitats: Surveying Land Management Impacts.

Ornithology

Moorland Breeding Birds

1.54 Moorland breeding bird surveys will be undertaken to monitor the effect of peat resource restoration measures on moorland breeding birds within the Site. An updated baseline (Year 0) to map the presence and distribution of moorland breeding birds will be undertaken prior to the commencement of construction works, with monitoring subsequently undertaken in years 1, 3, and 5 of wind farm operation, then subsequently every five years subject to review.

1.55 The survey will employ an adapted Brown & Shepherd methodology[8] for censusing upland breeding waders, comprising a four-visit survey between April and July of each monitoring year.

Hen Harrier and Merlin

1.56 Although the Proposed Development is not predicted to have any adverse effects upon merlin or hen harrier, peat resource restoration measures and associated effects upon habitats have the potential to benefit these species. It is therefore proposed that breeding hen harrier and merlin surveys will be undertaken to monitor the effect of peat resource restoration measures on the use of habitats by these species and the uptake of nesting habitat. An updated baseline (Year 0) will be undertaken prior to commencement of construction works, with monitoring subsequently undertaken in Years 1, 3 and 5 of wind farm operation, and then subsequently every five years subject to review.

1.57 Monitoring within 2 km of the turbine locations in each year will map and assess the condition of areas of mature heather cover suitable for nesting harriers and merlin and will record flight activity and evidence of breeding attempts through protocols agreed in consultation with The Highland Council and NatureScot.

Red Throated Diver

1.58 Breeding red throated diver surveys will be undertaken to monitor the effect of the proposed diver rafts on breeding activity and productivity of red throated divers. It is proposed that an updated baseline survey (Year 0) is undertaken prior to commencement of construction works, with monitoring subsequently undertaken in Years 1, 3 and 5 of wind farm operation, and then every five years (subject to review).

Monitoring of lochans within 2 km of the turbine locations and the lochans with diver rafts deployed on them will allow the effectiveness of deploying diver rafts with respect to the breeding activity and productivity of red throated divers within the Site to be assessed. Monitoring protocols will be agreed in consultation with NatureScot.

Black Grouse

1.59 Black grouse lek surveys will be undertaken to monitor the effect of peat resource restoration and tree planting measures on local black grouse populations. An updated baseline (Year 0) will be undertaken prior to commencement of construction works, with monitoring subsequently undertaken in Years 1, 3 and 5 of wind farm operation, then subsequently every five years subject to review.

1.60 Monitoring in each year will comprise black grouse lek site surveys employing methods based on those described in Gilbert et al. (1998)[9]. The aim of these surveys is to count the maximum number of male black grouse attending lek sites and to map the location of each lek.

Golden Eagle prey species monitoring

1.61 Golden eagle prey species monitoring surveys will be undertaken to monitor the effect of peat resource restoration measures (including grazing management) on golden eagle prey abundances. A baseline (Year 0) will be undertaken prior to commencement of construction works, with monitoring subsequently undertaken in Years 1, 3 and 5 of wind farm operation, then subsequently every five years subject to review.

1.62 Monitoring in each year will comprise prey transects, adopting protocols to be agreed in consultation with NatureScot.

1.63 Consultation will also be undertaken with the Highland Raptor Study Group to agree protocols for monitoring of the Territory A and Territory B golden eagle ranges (see **Appendix 9.4 Confidential Ornithology** of the 2023 EIA Report), including monitoring of breeding occupancy, outcomes and productivity and nest prey remains. The survey effort will be designed to avoid duplication with the RECMP where appropriate.

Showing a view of Loch nam Meur (to the south of the Site)

Summary of Potential Benefits

Peat Resource Restoration

1.64 Up to 152 areas in and around the Site are proposed for peatland restoration. The 16 eroded / bare areas identified in the OPMP (**Appendix 7.3** of the 2023 EIA Report) will be restored using excavated peat and comprise 3.65 ha of restoration; no buffer is applied to these areas. The additional 136 areas identified (see **SEI Chapter 3: Ecology and Peat Assessment Update**) will be restored using machine-based Peatland ACTION techniques or hand techniques, and comprise 101.2 ha of restoration; the same 10 m habitat impact assessment buffer that was agreed for assessing direct and indirect habitat impacts (see **SEI Appendix C High-Resolution National Vegetation Classification (NVC) Survey Report** of the SEI Report) was applied to assess these areas.

1.65 As such, a total of 104.8 ha is proposed for peatland restoration. This represents a ratio of 1:9.4 (loss:restored). Each area has been visited by an experienced peatland surveyor, and the most suitable restoration method has been identified. This ensures that restoration is both appropriate and feasible, and that it will deliver positive outcomes for peatland habitats and wider biodiversity.

1.66 Areas currently characterised as bare peat are more easily eroded by flowing water, but also by wind scour, frost and drying as all of these remove peat particles. On steeper slopes bare peat dries due to a dewatering effect and this is more susceptible to increased erosion. Therefore, any methods that reduce the presence of bare peat are beneficial.

1.67 Furthermore, infill of eroded areas with excavated peat prevents continued erosion. Reprofiling prevents erosion as peatland habitat is used to cover areas of bare peat which will also prevent slumping. Hydrological control through the installation of damming structures, where feasible, offers the potential for long term habitat restoration through the creation of an environment that will promote peat generation. The correct siting and installation of dams is also critical to the subsequent generation of peat forming vegetation.

1.68 Peatland restoration measures will aim to restore hydrological function and reduce exposure and erosion of the peat substrate. This will promote the growth of peatland species and recovery of degraded vegetation to a complete canopy, thereby benefiting flora and fauna that are reliant on a healthy peatland structure and function. The measures proposed will provide additional opportunities

[8] Brown, A. F. & Shepherd, K. B. (1993) A method for censusing upland breeding waders. Bird Study, 40, pp. 189-195.

[9] Gilbert, G., Gibbons, D.W. & Evans, J. (1998) Bird monitoring methods. RSPB Sandy, Bedfordshire.

for associated peatland biodiversity, including invertebrates and plant species, which in turn will benefit breeding moorland birds and foraging raptors.

Tree and Montane Scrub Planting

1.69 Tree and scrub planting will provide foraging and sheltering opportunities for a variety of species of conservation interest that are known to be present within the Site such as bats, otter and pine marten. Birds including upland passerines and black grouse will benefit from the increased availability of habitat resources, and prey species of golden eagle will benefit (for example black grouse, mountain hare, red squirrel and pine marten), which will in turn benefit the eagles themselves. Planting provides opportunities to connect into existing woodland blocks and introduce a more varied species mix of native tree species.

1.70 Planting riparian trees along the Allt Seanabhaile will provide additional shelter along the riparian corridor into the Site, providing cover for species such as black grouse, otter, red squirrel and pine marten, and enhancing the foraging route for bats. As no compensatory planting for tree loss is required, all riparian planting would provide habitat and woodland enhancement.

1.71 Riparian planting will improve watercourse quality through the introduction of shading, enhancing watercourse functioning, with additional benefits including flood risk management and bank stabilisation, with these in turn protecting freshwater habitats used by a range of species. Fisheries will benefit from riparian planting through the casting of shade (resulting in maintenance of cool water temperatures), provision of cover and sources of food from in-falling litter and insects.

1.72 Juniper translocation and/or cultivation may be considered appropriate and beneficial to contribute to the mixed tree planting and to enhance the resilience of the existing population, but this would only be carried out in line with the checks and balances outlined above. It will be beneficial to explore the health and viability of the existing juniper population within the Site, and to identify whether conservation management may be beneficial to ensure the survival and resilience of the existing population.

1.73 All non-riparian tree and montane scrub planting would also provide an environmental enhancement, as it is not required for mitigation purposes.

1.74 Bird species will benefit from the additional resources afforded by the montane scrub planting. Notably, this planting would be expected to provide additional cover for species such as upland woodland passerines, black grouse and mountain hare. Native tree planting will provide cover for black grouse and also an additional winter food resource. Measures that increase prey availability will benefit golden eagle.

Grazing Management

1.75 Monitoring of grazing pressure, and interventions as necessary, will promote the success of other proposed OREP measures and ensure the ongoing management of sensitive upland habitats within the Site.

Water Vole Monitoring

1.76 Small upland water vole populations are very sensitive to non-predictable events, including predation. Monitoring of the population on Site would allow assessment of the density of and variation within the population, while monitoring of strategically located mink raft(/s) would act as a warning system of a possible predation issue.

Ornithology

Provision of Diver Rafts

1.77 The red-throated diver is listed on Schedule 1 of the W&CA 1981 and as such receives additional protection (over other bird species). It usually nests in scrapes on the ground, close to edge of upland waterbodies and therefore, nests are susceptible to predation (foxes, otter), trampling (sheep, deer) and flooding.

1.78 'Diver rafts' are a well-established mitigation measure, with evidence suggesting they are the most effective means of providing optimal nesting opportunities for divers, which markedly reduces risk of nest predation, trampling by large mammals and flooding.

Peatland Habitat Restoration

1.79 The maintenance or improvement of peatland habitats as detailed above will avoid, at minimum, adverse impacts upon breeding waders such as golden plover, greenshank, dunlin and lapwing, which are all also prey species for golden eagle. It is noted that current grazing densities are considered to be below recommended maxima and it is not therefore considered essential to achieve a reduction below these baseline densities.

Golden Eagle

1.80 As noted above, tree planting at the Site will provide additional cover and food resource for prey species of golden eagle.

1.81 The initial aim of the RECMP is to positively contribute to the regional conservation status of golden eagle in NHZ 7 Northern Highlands through improved monitoring of the species' population and breeding status. The objectives of the RECMP could also be extended to include research and practical conservation management actions to enhance the size and productivity of the NHZ 7 golden eagle population, where possible. The RECMP will also provide for support and contribution to research to improve species knowledge, including to further understand and address threats or constraints, and opportunities for regional population growth for golden eagle.

Landscape and Visual

1.82 With respect to landscape and visual qualities, additional tree planting of native species offers opportunities to create a more intact, higher quality, and more diverse landscape as a result of:

- planting to increase the presence of woodland and scrub, including riparian woodland along watercourses; and
- repair of peat to reduce the presence of scarring and eroding/ hagged faces, which are visual detractors.

1.83 If deer/stock-proof fencing is proposed, it is accepted that this fencing would cause temporary adverse visual impacts within open landscape. However, such impacts are considered to be outweighed by the landscape and visual benefits of the related restoration and enhancement measures.

Conclusion

1.84 The principles set out above will be applied when the final Restoration and Enhancement plan is drawn up and agreed post-consent. The proposals described in this outline plan offer notable opportunities for a number of interrelated environmental enhancements at the Loch Liath Wind Farm Site with respect to peat resource, biodiversity, forestry and landscape.

Showing modified bog within the Site with an area of peat hagging containing bare peat.

Loch Liath Wind Farm
for Loch Liath Wind Farm Ltd

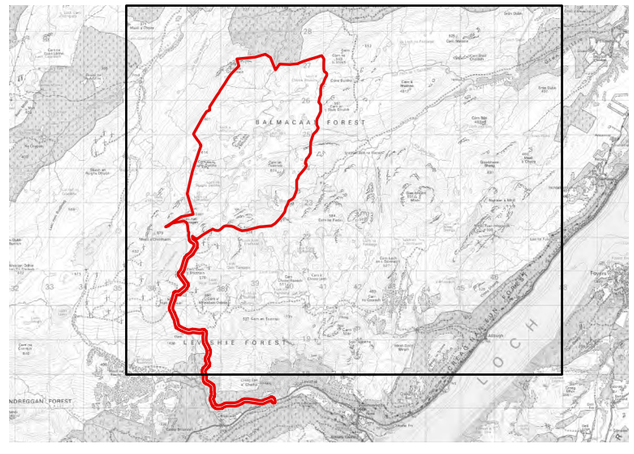
LUC

SEI Figure 8.9: Proposed OREP Measures

- Site boundary
- Turbine
- Construction compound
- Substation
- Borrow pit
- Temporary hardstanding
- Permanent hardstanding
- Met mast
- New access track
- Existing access track

Proposed OREP Measures

- Approximate diver raft location (embedded mitigation)
- Approximate additional diver raft location (enhancement)
- Riparian scrub planting search area (proposed 5ha targeted, within 15ha search area)
- Mixed native woodland planting search area (proposed 30ha minimum, within 155ha search area)
- Montane scrub planting search area (low density in suitable habitat within 200ha search area)
- Area of additional peatland restoration (101.2 ha)
- Peat infill restoration areas (3.65 ha) as identified in the OPMP (Appendix 7.3 of the EIA Report)



Statkraft

Map scale 1:45,000 @ A3

CB:SR EB:simmonds_p LUC 12510 - Loch Liath Wind Farm Post Submission Support 25/10/2024
Source: Statkraft, LUC