Appendix 6.6: Outline Restoration and Enhancement Plan

EDF Energy Renewables Ltd

Dunside Wind Farm

Appendix 6.6: Outline Restoration and Enhancement Plan (OREP): Peat, Biodiversity, Landscape and Visual Amenity

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Contents

Chapter 1
Introduction

1.1 This appendix details the Outline Restoration and Enhancement Plan (OREP): Peat, Biodiversity, Landscape and Visual Amenity plan to be implemented as part of the proposed Dunside Wind Farm (hereafter referred to as the 'Proposed Development').

1.2 This appendix was written to support **Chapter 6: Ecology** and should be read in conjunction with **Chapter 4: Landscape and Visual Impact Assessment**, **Chapter 5: Cultural Heritage**, **Chapter 7: Ornithology** and **Chapter 8: Hydrology, Hydrogeology, Geology and Peat**.

1.3 This appendix supports the EcIA in addition to the following EIA Report Appendices:

- **Appendix 6.1**: Desk Study and Legal Context.
- **Appendix 6.2**: Habitats and Vegetation.
- **Appendix 6.3**: Protected Species Survey Report.
- **Appendix 6.4**: Bat Survey Report.
- **Appendix 6.5**: Badger Survey Report (Confidential).
- **Appendix 6.7**: Shadow Habitat Regulations Assessment (HRA).
- **Appendix 6.8**: Peat Condition Assessment.
- **Appendix 8.2**: Peat Survey Report.
- **Appendix 8.3**: Peat Management Plan.
- **Appendix 8.4**: Peat Landslide Hazard and Risk Assessment.

1.4 This appendix is supported by the following figures:

- **EIA Report Figure 6.1**: Ecology Study Area.
- **EIA Report Figure 6.10a**: Outline Restoration and Enhancement Map.
- **EIA Report Figure 6.10b**: Outline Restoration and Enhancement Plan Landscape Vision

Scope

1.5 LUC was appointed by EDF Energy Renewables Ltd to complete a suite of ecological surveys and assessments, to inform an EIA of the Proposed Development.

1.6 In March 2022 LUC submitted a Scoping Report (on behalf of the Applicant) as a means of agreeing the full scope of surveys and assessments relevant to the EIA. This included the requirement to provide an outline habitat management plan[1] during the construction and operational phases of the Proposed Development.

Site Overview

1.7 The Site is located within the Lammermuir Hills, within the administrative boundary of Scottish Borders Council. The northern Site boundary is also the boundary between the Scottish Borders and East Lothian. The Site is approximately 6 km north of the settlement of Westruther and 7 km to the west of the settlement of Longformacus (to the nearest proposed turbine location).

[1] Subsequently re-titled as an Outline Restoration and Enhancement Plan (OREP).

1.8 The Site consists of a varied topographic setting of heavily managed moorland dominated by heather, with numerous river valleys, steep sloping hillsides and gently sloping hilltop areas which predominately drain into the Dye Water catchment (a tributary of the River Tweed). The Dye Water flows to the east through the centre of the Site and joins the Whiteadder Water downstream of the Site. Notable hills within the Site include: Meikle Law (468 m AOD) in the north-west; Byrecleugh Ridge (440 m AOD) in the north, Dunside Hill (437 m AOD) in the south-east, and Wedder Lairs (486 m AOD) in the west. The main land uses are sheep grazing and moorland managed for grouse shooting, with the adjacent land to the north-west used for renewable energy production (the operational Fallago Rig Wind Farm).

1.9 The majority of the habitats within the Site have been influenced to varying extents by grazing pressure, recent and historical burning and artificial drainage. The Proposed Development is described in greater detail within **Chapter 3: Development Description** within the EIA Report.

Overall Objective of the Outline Plan

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

1.11 Once finalised, in consultation with Scottish Borders Council, East Lothian 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 improve habitat connectivity by enhancing riparian corridors 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 enhancement of upland habitats and improvements in water quality. The final plan will include a monitoring programme and review framework to track and report on the efficacy of these 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.

Terminology

1.12 The following terminology is used throughout this Appendix:

- **Site**
  - All land within the red line boundary (as shown in **EIA Report Figure 6.1**).
- **Proposed Development**
  - The whole physical process involved in the construction, operation and decommissioning of a Wind Farm at the Dunside Site (i.e. not associated with a particular piece of land).
  - Comprises a wind farm of up to 15 turbines and associated infrastructure. A detailed description of the Proposed Development is included **Chapter 3**).
- **Study Area**
- The following Study Areas were adopted in undertaking the desk study. Further information is provided in **EIA Report Table 3.1**:
  - Statutory designated sites for nature conservation purposes: Red-line boundary plus 10 km buffer for non-avian designations and 20 km for avian designated sites.
  - Non-statutory designated sites for nature conservation purposes: Red-line boundary plus 5 km buffer.
  - Existing protected species records: Red-line boundary plus 5 km buffer. 10 km buffer for bats.

Baseline Conditions: Key Considerations and Opportunities

Non-avian Ecology

1.13 **EIA Report Chapter 6** provides a detailed interpretation of the ecological baseline of the Site.

1.14 One statutory designated site and two non-statutory sites were identified within the Site in relation to non-avian ecology.

- River Tweed Special Area of Conservation (SAC)/ Site of Special Scientific interest (SSSI). The Dye Water, located in the northern edge of the designated area, rises to the west of the Site and flows through its centre. The Dye Water is a tributary of the Whiteadder Water, which is a tributary of the Tweed. The Dye Water flows for approximately 5.5 km through the Site, however only 3 km of the watercourse is designated, representing 0.002% of the SAC's total c.1285 km length. The Proposed Development's access track, which is via an existing wind farm track (for Fallago Rig wind farm), also crosses the Blackadder Water, a tributary of the River Tweed, which rises to the south of the Proposed Development, in the Harecluegh Forest. The River Tweed SAC is designated for:
  - Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation.
  - Atlantic salmon, otter, sea lamprey, brook lamprey and river lamprey.
- Byrecleuch Burn, Stot Cleugh Local Biodiversity Site (LBS) is designated for cleughs and burnsides with nationally scarce plants and locally rare plants and moths.
- Corby Scar and Upper Watch Water LBS is designated for acid burnsides with a high diversity of grassland plant species, including several local rarities.

1.15 The Watch Water LBS was located immediately adjacent to the Site, this is designated for its burnsides, rocky banks with a high diversity of grassland plants, locally rare plants and moths.

1.16 In addition, ten statutory designated sites located within10km of the Site and 14 non-statutory designated sites are present within 5 km: However, these lack structural and functional connectivity to the Site.

1.17 Further information on designated sites in the vicinity of the Proposed Development are included in **EIA Report Appendix 6.1**.

1.18 Habitats within the Site were found to be dominated by managed moorland/dry dwarf shrub heath strips with mosaics of acid/ marshy grassland, improved grassland, modified heath and modified bog with localised broad-leaved woodland and conifer plantation. The following habitats of conservation concern were recorded within the Site:

- Four Annex 1 habitats: H4030 European dry heaths; H7130 Blanket bogs; H4010 Northern Atlantic wet heaths with *Erica tetralix* and H7220 Hard-water springs depositing lime.
- Six Scottish Biodiversity/LBAP List habitats: Upland Heathland; Blanket Bogs; Upland Flushes, Fens and Swamps; Upland birchwoods; Marshy grassland and Rivers.
- Six potential Ground Water Dependent Ecosystem communities: M6, M15, M23, M25, M37 and MG10.

1.19 The habitats on site supported low level of the following protected species:

- Badgers *Meles meles*;
- Otter *Lutra lutra*;
- Mountain hare *Lepus timidus*;
- Bats:
  - Common pipistrelle *Pipistrellus pipistrellus*.
  - Soprano pipistrelle *Pipistrellus pygmaeus*.
  - Unidentified *Pipistrellus* species.
  - Brown long-eared bat *Plecotus auiatus*.

- Unidentified *Myotis* species.
- Daubenton's bat *Myotis daubentonii*.
- Leisler's bat *Nyctalus leisleri*.
- Noctule bat *Nyctalus noctula*.

1.20 Prior to mitigation and enhancement, the Proposed Development is not predicted to have any significant effects, within the definitions defined in the EIA regulations, with respect to non-avian ecological interests.

1.21 The Proposed Development offers an opportunity to introduce interventions that will improve the biodiversity, and overall ecological importance, of the Site, which currently experiences intensive upland management regimes.

Ornithology

1.22 There are no statutory designations for ornithological features within the Site, however there are three SPAs (alongside the associated SSSIs and Ramsar sites that underpin these SPAs) within 20 km of the Proposed Development (**EIA Report Figure 7.4**);

- Greenlaw Moor SPA (underpinned by the Greenlaw Moor SSSI and Ramsar): approximately 11.1 km to the southeast of the nearest turbine, designated for non-breeding pink-footed goose.
- Fala Flow SPA (underpinned by the Fala Flow SSSI and Ramsar): approximately 15.1 km to the west of the nearest turbine, designated for non-breeding pink-footed goose.
- Firth of Forth SPA (underpinned by the Firth of Forth SSSI and Ramsar): approximately 18.3 km to the north of the nearest turbine, designated for non-breeding bar-tailed godwit, common scoter, cormorant, curlew, dunlin, eider, golden plover, goldeneye, great crested grebe, grey plover, knot, lapwing, long-tailed duck, mallard, oystercatcher, pink-footed goose, red-breasted merganser, red-throated diver, redshank, ringed plover, sandwich tern (passage), scaup, shelduck, Slavonian grebe, turnstone, velvet scoter, wigeon and waterfowl assemblage.

1.23 As detailed in **Chapter 7** of the EIA Report, baseline surveys undertaken between September 2020 and November 2022 recorded flights of the following: an assemblage of moorland birds, water fowl and raptor species, including curlew, lapwing, golden plover, pink-footed goose, golden eagle and short-eared owl. The Proposed Development is not predicted to have significant effects upon any bird species with mitigation.

1.24 Curlew were identified as a key ornithological feature for inclusion in the OREP, in line with **Chapter 7** which includes an objective to maintain or increase the numbers and productivity of breeding waders, particularly curlew, within the Site. This is specifically designed to deliver focussed habitat enhancement to maintain and increase the breeding curlew population. It should be noted that this will also be of benefit to other breeding waders (including lapwing and golden plover).

Peat Resources

1.25 As detailed in **EIA Report Chapter 8**, the Proposed Development is 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.

1.26 Detailed peat depth surveys were undertaken within the Site. The results of the peat survey are shown in **EIA Report Figure 8.7** and presented in full in **EIA Report Appendix 8.2**.

1.27 A total of 3,088 peat depth probes were collected over the Phase 1 and Phase 2 peat surveys. Of these:

- 38.1% of probes were recorded as having a depth of less than 25 cm. These probes are not peat.
- 43.1% of probes were recorded as having a peat depth of between 25 – 50 cm. These probes are classified as organo-mineral soils and not formally considered to be peat.
- 16.2% of probes were recorded as having a peat depth of between 50 – 100 cm.
- 2.7% of the probes were recorded as having a peat depth of over 100 cm.
- The deepest peat depth recorded on the Site was 380 cm.

1.28 Local topography affects the peat distribution, with the hillslopes generally too steep and well drained to support the formation of peat. The tops of the hills throughout the Site are gently rolling, with most of the peat present in poorly drained naturally low points on the upland plateau.

1.29 Much of the upland peat areas of the Site have been modified by human influences, and muirburn is practiced across much of the Site. The Site is also grazed by sheep. These factors have led to the drying and erosion of much of the peat present across the site (see **Figure 1.1** below).

1.30 The results from the Phase 1 peat survey were used to feed into the design (deeper peat was avoided where possible) and the spatial extent of the Phase 2 peat survey. The Phase 1 and Phase 2 peat survey results were used to inform the Peat Management Plan (**Appendix 8.3**) and Peat Landslide Hazard and Risk Assessment **(EIA Report Appendix 8.4**). The implementation of the Peat Management Plan will create opportunities to reuse peat across the Site without generating a surplus. This will maintain the peat resources on Site and assist in the improvement of biodiversity, and overall ecological importance, of the Site.

Figure 1.1: Example of eroding bog

Landscape and Visual

1.31 The majority of the habitats within the Site have been influenced to varying extents by grazing pressure, recent and historical burning and artificial drainage.

1.32 Key current characteristics of the Site in landscape and visual term with implications for this management plan include:

- eroded peat with a ‘scarred’ appearance, which is a visual detractor;
- a lower diversity of vegetation cover than the Site’s potential, due to current and historic grazing pressures;
- large areas of land managed for shooting, with the indicative distribution of muirburn; and
- limited and small areas of scrub and riparian vegetation along watercourses, which would benefit from protection and enhancement.

1.33 The landcover on the Site consists mainly of heather moor and acid grassland. Tree cover is sparse, especially on the upper plateau where heather moorland vegetation dominates. Large areas of the Site have been managed for as a grouse moor for shooting, and the patchy growth pattern of the vegetation reflects the distribution of muirburn. There are a number of Public Rights of Way (PRoW) within the Site, including the Southern Upland Way which passes approximately 860 m to the south of the nearest proposed turbine (Turbine 14) and shares a section of the existing Falligo Rig access track which would also be used for the Proposed Development.

Land Use Considerations and Principal Restoration and Enhancement Area

1.34 The Site and its surroundings are in longstanding active use for sporting interests and sheep farming. The proposals set out in this outline plan aim to achieve environmental enhancement, whilst enabling the current land uses to continue to function.

1.35 In considering the principal for this OREP, the redline boundary of the Site was extended during the design process to include additional areas for habitat enhancement. As such the Proposed Development has considered the entirety of the redline boundary of the Site to constitute the principal restoration and enhancement area.

Chapter 2
Proposed Restoration and Enhancement Measures

2.1 The key parts of the Site to which the following proposals relate are illustrated in **EIA Report Figures 6.10a&b**. Please Note that habitat areas provided in **Figure 6.10** are indicative at this stage only. The plan provides the principal areas for the implementation of habitat mitigation and enhancement measures of the OREP. Further detailed design will be required to confirm the habitat areas and landscape specifications of the Restoration and Enhancement Plan (REP) based on the key constraints and practical considerations outlined within this document. The REP once adopted will be in effect for the duration of the development and will be subject to periodic monitoring and review.

Governance and Interpretation

2.2 Given the number of interested parties during the Scoping consultation process, and that this OREP proposes interventions over an extensive area, it is proposed that the final Restoration and Enhancement is delivered by the Developer in consultation with a Restoration and Enhancement Steering Group (RESG), comprising the following membership:

- The developer (Chair).
- The landowner (and estate managers).
- A principal contractor (when appointed).
- A restoration contractor (when appointed).
- Various members of an appointed environmental consultant team.
- Other parties such as Tweed Foundation and River Tweed Commission to be engaged or consulted as required on specific interventions.

Constraints and Practical Considerations

2.3 All areas on **EIA Report Figure 6.10** are indicative only at this stage. The land coverage of the options outlined below will need to be confirmed post consent will take into account the following factors:

- Peat depth - no planting will take place in peat >50 cm in depth.
- Terrain – some slopes are inaccessible due to steep topography.
- Localised soil and hydrological conditions.
- Presence of potential Ground Water Dependent Ecosystems (GWDTE's;)
- Otters are known to utilise various watercourses within the Site; therefore, planting will be planned in such a way as to avoid disturbance of this and other protected species.
- Heritage assets – appropriate buffers will be applied around heritage assets within the Site to safeguard these features. Further detail is provided within **EIA Chapter 5: Cultural Heritage**.
- Appropriate planting schedules will be developed to include native shrub and tree planting of local provenance and appropriate to the soil and hydrological conditions present.
- Works will be undertaken under the guidance of an Ecological Clerk of Works.

2.4 The Roxburghe Estates (landowner/estate managers) has provided input to the outline proposals with insights to where planting and interventions have been successful or failed in the past and highlighting the areas of most importance for farming practices to ensure that the outline proposals are achievable. The detailed REP for the Site would be developed prior to construction and would continue to draw on the estate's experience and operational requirements. The final REP would use

updated pre-construction surveys and contemporary and emerging best practice guidelines for habitat management. The proposed monitoring would enable periodic, long-term evaluation of where interventions have been successful and, when they have not succeeded, where alternative approaches might be beneficial.

2.5 Additionally, the REP will provide further detail and guidance regarding the Landscape Management practices and planting scheduled to be adopted post-consent. The details of the landscape management elements of the OREP will be discussed and agreed as appropriate with the landowner.

Non-Peat Habitat Enhancement

Objective 1: Riparian shrub/ woodland planting of key river corridors

2.6 It is proposed that riparian shrub/ woodland planting is undertaken along river corridors within the Site to increase coverage of riparian woodland, by introducing native broadleaved trees/ shrub planting. There is also potential to enhance and extend the reach of aspen which is currently present within the Site. This is a Local Biodiversity Action Plan Priority Species. Proposed areas of riparian shrub/ woodland planting are shown on **EIA Report Figure 6.10a and 6.10b**.

2.7 Riparian planting will aim to establish small groups of native trees/ shrubs along the riparian corridors of those water courses identified in **EIA Report Figure 6.10**. These will act as seed banks to encourage natural regeneration. Typically, this type of planting would favour drier areas, as trees will grow more successfully in the drier conditions.

2.8 Best practice guidance for riparian planting will be followed[2], 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.

2.9 Planting will comprise of a combination of continuous shrub and tree-dominated planting. Supplementary planting of native species will be of local provenance appropriate to the conditions at the Site. The species composition will be agreed post-consent but may include the ones listed in **Table 2.1** below.

Table 2.1: Indicative Riparian Tree and Shrub Species Composition

Locally Present Species for Inclusion	Other Potentially Relevant Native species
Aspen: Populus tremuloides	Alder: Alnus glutinosa
Bog Myrtle: Myrica gale	Downy birch: Betula pubescens
Dogwood: Cornus sanguinea	Eared willow: Salix aurita
Goat Willow: Salix caprea	Hawthorn: Crataefus monogyna
Juniper: Juniperus communis	Scots pine: Pinus sylvestris
Grey Willow: Salix cinerea subsp. Oleifolia	Sessile oak: Quercus petraea
Rowan: Sorbus Aucuparia	

2.10 Extending the riparian corridors will provide increased diversity and connectivity of habitats within the Site and improve habitat connections to the wider landscape. This resource will also provide additional food sources for a range of avian and mammal species in the spring and winter, together with suitable sheltering opportunities. These will provide improved connectivity to foraging and breeding habitats. This in turn, will benefit the qualifying features of the River Tweed SAC as these interventions will provide improved habitat connectivity, breeding, sheltering and foraging resources for otter, Atlantic salmon and lamprey species.

[2] 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 25/05/23].

2.11 During the establishment phase, trees will be protected in accordance with best practice guidance available at the time of planting and the characteristics of the planting locations. These protective measures are to be detailed further and confirmed post-consent.

2.12 Monitoring will be undertaken regularly to ensure planting is successful, and protective measures are in working order. Any necessary repairs to these protective measures should be carried out in good time to avoid damage to planting.

Objective 2: Species Rich Grassland

2.13 It is proposed that appropriate species rich grasslands are introduced to improve species diversity. This will include supplementary planting of native grass and wildflower species appropriate to the local conditions of the Site.

2.14 Several of the grassland areas identified for improvement are periodically grazed or utilised as temporary holding areas during lambing, therefore the seed mixes in these areas should include 'traditional' meadow species including wildflowers compatible with this land use.

2.15 There is potential for species rich grassland seeds to be harvested (or species mix to be informed) from the paddocks ("Fields at Byrecleugh Keeper's House") for use in other areas. The fields next to the house have never been sprayed with pesticides or herbicides and have established a diverse mix of species, including orchids and other native flower species. The potential to utilise this resource will be further investigated post-consent.

2.16 Inclusion of species rich grasslands will provide increased diversity and distinctiveness of habitats within the Site and will form part of the improved network of habitat connections to the wider landscape. This resource will also provide improved foraging, commuting and sheltering resources for a range of avian and mammal and invertebrate species.

2.17 Proposed areas for inclusion of species rich grassland are shown on **EIA Report Figure 6.10a and 6.10b**.

Objective 3: Native Shrub Regeneration

2.18 A small area has been identified to the south-east of the Site that currently comprises regenerating native shrub species. This area has been proposed for supplementary planting to enhance the species diversity in this area.

2.19 It is envisaged that the native shrub species included in this area would be similar to those species outlined in **Table 2.1**.

2.20 The inclusion of this area will provide a stepping-stone in the habitat network. This resource will also provide improved foraging, commuting and sheltering resources for a range of avian and mammal and invertebrate species.

2.21 Proposed areas for inclusion for native shrub regeneration are shown on **EIA Report Figure 6.10a and 6.10b**.

Peat Related Habitat Enhancement

Objective 4: Re-wetted areas (Bog and Heath Enhancement)

2.22 Two areas close to the centre of the Site are proposed for enhancement of existing marshy grassland/ heath and degraded bog habitat. It is proposed that these areas are encouraged to become wetter by implemented drain blocking to retain and slow the movement of water to aid colonisation by bog-forming and/ or heath species. Supplementary planting may also be appropriate, the requirement of this will be monitored and interventions made as appropriate.

2.23 Within areas of heathland improvement, it is anticipated that heather cutting will replace the current regime of burning so that the benefits of this alternative management approach can be monitored.

2.24 Enhancing the identified bog/ heath habitats will provide increased diversity and connectivity of habitats within the Site and improve habitat connections, particularly between the north and south of the Site and to the wider landscape. Restoration and enhancement of these habitats will provide a greater age structure within heathland habitats within the Site.

2.25 This resource will also provide additional food sources for a range of avian, mammal and invertebrate species, together with suitable sheltering opportunities, these will provide improved connectivity to foraging and breeding habitats.

2.26 Proposed areas for bog and heath enhancement are shown on **EIA Report Figure 6.10a and 6.10b**.

Drain Blocking

2.27 All man-made drains have been identified within the Site. It is proposed that blocking measures are undertaken across the areas identified close to the centre of the Site to reverse peat drying. It is proposed that blocking is undertaken of drains in the area shown on **Figure 6.10a and 6.10b**. The method of blocking would be determined post-consent according to best practice at the time, as these methods are continually evolving.

Objective 5: Heath Improvement

2.28 Heathland habitats within the Site have been heavily influenced by the current land management practices associated with grouse management. Four areas of heath improvement have been identified close the centre of the Site. The aim is to encourage regeneration in these areas, through a reduction in grazing pressure, to increase the biodiversity of floral and faunal species present and improve the overall diversity of the age structure of the heath within the area.

2.29 Within these areas of heathland improvement, it is anticipated that heather cutting will replace the current regime of burning so that the benefits of this alternative management approach can be monitored. These areas may require supplementary planning of native shrub species of varying ages to provide a more diverse age structure to the habitat.

2.30 Enhancing the identified heath habitats will provide increased diversity and connectivity of habitats within the Site and improve habitat connections, particularly between the north and south of the Site and to the wider landscape. Restoration and enhancement of this habitat will provide a greater age structure within heathland habitats within the Site.

2.31 This resource will also provide additional food sources for a range of avian, mammal and invertebrate, together with suitable sheltering opportunities, these will provide improved connectivity to foraging and breeding habitats.

2.32 Proposed areas for bog and heath enhancement are shown on **EIA Report Figure 6.10a and 6.10b**.

Protected Species Enhancement

Objective 6: Habitat Enhancement in Relation to Curlew

2.33 **Chapter 7** highlighted an opportunity to improve breeding and foraging habitats for curlew within the Site. The species breed on open moorland, rough and damp pastures, unimproved hay meadows and boggy ground. The interventions outlined in **Objectives 1-5** above will provide enhanced habitats for curlew and a number of other avian and mammal species.

Protection and Grazing Management

2.34 Supplementary planting of tree and shrub species will require protection to enable planting to establish due to the exposed nature of the Site and presence of livestock (e.g. tree tubes supported with wooden stakes, or fencing). Appropriate protection measures will be implemented as appropriate; this will be determined post-consent.

2.35 If stock-proof fencing is required, this is likely to require ‘fence strike markers’ to avoid bird strikes as raptors, grouse and wildfowl specifically tend to fly low through valleys and along watercourses.

2.36 The grazing management regime is to be agreed post-consent. However, it is recommended that grazing in areas of species rich grassland be limited in late spring and summer, in order that plants are encouraged to flower and set seed.

Chapter 3
Monitoring

3.1 This section provides details of the monitoring required during the lifetime of the OREP.

3.2 An Advisory Environmental Clerk of Works (ECoW) (or equivalent) will be appointed to advise, monitor and report on compliance with relevant legislation, policy and project specific mitigation during the construction period, including to monitor the effectiveness of the OREP.

Vegetation

Bog and Heath Restoration

3.3 The efficacy of bog and heathland restoration measures and 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.

3.4 Details of the monitoring programme will be confirmed post-consent; however, such monitoring will make use of published methodologies[3] and is anticipated to include measures such as:

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

3.5 Monitoring will record trends in the condition, distribution and abundance of dwarf shrubs including heather (and including recording signs of heather beetle). The abundance and distribution of other key bog species will also be recorded.

Peat Monitoring

3.6 Mitigation of residual peat instability risks will be supported by good practice construction measures and by monitoring both during and after construction. Further details are provided in **Appendix 8.4**, **Section 6.3**, and **Section 6.4**.

3.7 Satisfactory implementation of the PMP in order to mitigate peat loss / disturbance will be assured by monitoring both during and after construction. Further details are provided in **Appendix 8.3**, **Section 7.6**.

Hydrological Monitoring

3.8 Groundwater monitoring will be put in place to assess the quantitative and chemical effect of the infrastructure to check that the groundwater flow and quality to GWDTEs TN1 and TN2 are not statistically significantly changed post construction. Monitoring will be carried out based on SEPA guidance and will comprise groundwater monitoring at the flushes/seeps and at a series of groundwater monitoring wells. Details of the monitoring will be agreed with SEPA and set out in the CEMP.

3.9 Monitoring of water quality and quantity of the groundwater abstractions for Dunside will be undertaken before, during and after construction to ensure no contamination of the supply. Monitoring will be undertaken by an ECoW (or equivalent) and monitoring locations will be identified in the CEMP.

[3] For example, Macdonald et al. (2007) A Guide to Upland Habitats: Surveying Land Management Impacts.

3.10 If the water quality deteriorates during construction (e.g. discoloured, high sediment content, hydrocarbons) an alternative water supply will be installed, such as portable bowsers, to ensure minimal disruption of supply. The contractors will have a supply of bowsers ready to deploy, if required.

Tree and Shrub Planting

3.11 Areas of planted trees and shrubs will be monitored in the initial 3 years after planting, and any failed trees/ shrubs 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, as part of the Landscape Management Plan.

Grazing Pressure Monitoring

3.12 Regular review of grazing pressures of the habitats being enhanced with the Site, will be undertaken in conjunction with Roxburghe Estate. The aim of these reviews will be to optimise biodiversity enhancement and natural regeneration across the Site and to agree and implement appropriate actions if grazing pressure are impacting the establishment of supplementary planting and/ or impeding natural regeneration in these areas. As an indication of stocking densities, NatureScot guidance outlines the following indicative stocking densities[4]:

a. Open bog: 0.02 livestock units/ Ha/ year;
b. Fen/Swamp: 0.1 livestock units/ Ha/ year;
c. Wet purple moor grass heath: 0.25 livestock units/ Ha/ year; and
d. Semi natural grassland: 1 livestock units/ Ha/ year.

Protected Species

3.13 The results of updated protected species surveys will be taken into account during the refinement and implementation of the REP. Detailed requirements for protected species will be addressed in the Outline Construction and Environmental Management Plan and Species Protection Plan, as will ongoing monitoring requirements. This will include the following:

- Pre-construction surveys of all water-crossings immediately prior to construction (i.e. with season immediately prior) to assess use of the locations by otter.
- Pre-construction protected species surveys of proposed infrastructure locations and access routes no more than six months prior to construction, to assess the current status and usage of the Site.
- Pre-construction fish habitat surveys in the season prior, to micro-site the crossings away from potentially sensitive habitats wherever possible, and to confirm the habitat baseline within a buffer of up to 100 m upstream and downstream.
- Monitoring of a range of ecological features by the ECoW throughout construction of the Proposed Development.
- Post-construction fish habitat surveys and monitoring programme to be established in line with best practice[5] to ensure mitigation measures are effective, that crossings maintain fish passage, and that potentially sensitive habitats are retained, and to identify any requirement for improvements or remedial works.
- A programme of bat mortality monitoring will be implemented once the Proposed Development is operational, this will be in line with relevant best practice guidelines.

[4] NatureScot. Peatland Action – Peatland Management Guidance – Grazing, and Muirburn. Available at: Peatland ACTION - Peatland Management Guidance - grazing, and muirburn | NatureScot [Accessed 25/05/23].
[5] Scottish Government. Monitoring Watercourses in Relation to Onshore Wind Farm Developments -Generic Monitoring Programme. Available at: https://www.gov.scot/publications/monitoring-watercourses-in-relation-to-onshore-wind-farm-developments-generic-monitoring-programme/ [Accessed April 2023]

Chapter 4
Summary of Potential Benefits

Riparian Trees and Shrubs

4.1 With respect to biodiversity, riparian and non-riparian tree/ shrub planting will be established on suitable soils where woodland could naturally establish. There will be no loss of trees/ woodland as a result of the Proposed Development, therefore following the mitigation hierarchy these measures will provide enhancement as a result of the Proposed Development.

4.2 New riparian habitats will provide foraging and sheltering opportunities for a variety of protected and notable species that are known to be present within the Site such as bats, otter and badger. Birds will benefit from the increased availability of habitat resources, and prey species of raptors including hen harrier and golden eagle will continue to be encouraged. Planting provides opportunities to link existing woodland blocks and introduce a more varied species mix of native tree species.

4.3 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.

4.4 Detailed tree planting measures may incorporate additional objectives for other species but will remain sensitive to the need to avoid increasing potential impacts upon species groups resulting from the Proposed Development.

4.5 With respect to landscape and visual qualities, additional tree planting of native species offers opportunities to create a more intact and higher quality, more diverse landscape.

4.6 Taking into account the opportunities to achieve a more diverse native species mix within the OREP, tree planting within the Site also offers the potential for substantial enhancement of the Site.

Grassland Habitats

4.7 Inclusion of species rich grasslands will provide increased diversity of habitats within the Site and will form part of the improved network of habitat connections to the wider landscape. This resource will also provide improved foraging, commuting and sheltering resources for a range of avian and mammal and invertebrate species.

Bog and Heathland Resources

4.8 Drain blocking will benefit the peat resource by raising the water table within these areas. This will slow down movement of water within the area and encourage growth of bog forming species.

4.9 Within areas of heathland improvement, it is anticipated that heather cutting will replace the current regime of burning so that the benefits of this alternative management approach can be monitored.

4.10 The above measures will not only enhance the Site's peat resource but also provide enhanced opportunities for associated peatland and heath biodiversity, including small mammal, invertebrates and plant species, which in turn will benefit a variety of breeding birds and mammals.

Curlew

4.11 Curlew breed on open moorland, rough and damp pastures, unimproved hay meadows and boggy ground. The habitat enhancements outlined within this OREP seeks to increase the suitability and connectivity of these habitats present within Site, therefore in turn will increase habitats suitability for curlew and a range of other avian and non-avian species. This meets the objectives as outlined within **Chapter 7**.

Conclusion

4.12 Subject to the principles set out above being taken into account when the detailed Restoration and Enhancement Plan is drafted and agreed prior to construction, the proposals described in this OREP offer opportunities for substantial, interrelated environmental enhancements at the Dunside Wind Farm Site with respect to peat resource, biodiversity, and landscape and visual amenity.