Cloud Hill Wind Farm

Technical Appendix 7.6 Outline Biodiversity Enhancement Management Plan

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Technical Appendix 7.6

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1 INTRODUCTION

This Outline Biodiversity Enhancement Management Plan (OBEMP) describes the proposed habitat and conservation management measures in relation to Cloud Hill Wind Farm (hereafter referred to as the 'Proposed Development').

This OBEMP is set out in the following sections:

- Summary of the Ecological and Ornithological Impact Assessments;
- Biodiversity Enhancement Area;
- Aims, objectives and management prescriptions;
- Monitoring; and
- Management and monitoring timetable.

1.1 Target Habitats and Species

The management recommendations within this OBEMP are based on the findings of Chapter 7: Ecology and Chapter 8 Ornithology within the Cloud Hill Wind Farm EIA Report. The key habitats addressed are Annex I habitats blanket bog and wet modified bog. The key ornithological species are black grouse and wader species (with a focus on curlew). Recommendations are also included to achieve significant biodiversity enhancement at the Site, in line with objectives outlined in National Planning Framework 4 (NPF4) Policy 3[1].

1.2 Finalisation of the BEMP and Reporting

This OBEMP will be refined through the consenting and pre-construction process of the Proposed Development. The final BEMP will confirm the Biodiversity Enhancement Area (BEA), and any management units therein, where the aims, objectives and management prescriptions will apply. The final BEMP will be agreed with Dumfries and Galloway Council in consultation with NatureScot prior to the commencement of construction of the Proposed Development.

A Biodiversity Management Group (BMG) will oversee and monitor the implementation of the agreed OBEMP. The BMG should include representatives from Dumfries and Galloway Council, NatureScot and the wind farm owner.

An annual report will be submitted by the wind farm owner to the BMG, for at least the first 5 years, detailing the tasks (management and monitoring) completed over the last year and those planned for the year ahead. After this time, it may be appropriate to reduce the frequency of the reports to once every five years or as otherwise agreed with the BMG. Any monitoring reports will be issued to the BMG as they are produced.

Management prescriptions in the BEMP may be amended in light of monitoring results to ensure progress towards the stated aims of the plan.

[1] Scottish Government (2023). National Planning Framework 4. Available at: https://www.gov.scot/publications/national-planning-framework-4/ [Accessed February 2023].

2 SUMMARY OF ECOLOGICAL AND ORNITHOLOGICAL IMPACT ASSESSMENTS

2.1 Ecology

The Proposed Development Area is dominated by marshy grassland, with unimproved acid grassland and wet modified bog. Within and around these areas are patches and pockets of other habitat types such as bracken, semi-natural woodland, improved grassland, and blanket bog.

Important ecological features scoped-in to the ecological impact assessment comprise blanket bog, wet modified bog and bats (high collision risk species, including common pipistrelle, soprano pipistrelle, and *Nyctalus* spp.). Potential collision risk impacts to bats during operation would be mitigated in accordance with the proposals detailed in section 7.7.1.2 of Chapter 7: Ecology. The Proposed Development would impact 0.74 ha of blanket bog (direct 0.34 ha and indirect 0.4 ha) and 6.67 ha of wet modified bog (direct 2.63 ha and indirect 4.04 ha). This OBEMP proposes measures to compensate for the impact on blanket bog and wet modified bog habitats.

2.2 Ornithology

During the ornithology baseline surveys, black grouse were recorded and identified to be lekking at one location (four males, one occasion) on the Site in June 2019 (665 m from the nearest turbine, Figure 8.5).

Waders, including curlew and lapwing, were recorded during the baseline breeding season surveys, with curlew recorded regularly across the Site, and lapwing record within the north-east extent only (Figure 8.14). Curlew and lapwing, now Red Listed species, are considered to be highly sensitive to disturbance (Goodship and Furness et al (2022)[2].

Important ornithological features scoped-in to the ornithological impact assessment comprise black grouse, curlew and lapwing. Potential displacement of black grouse lekking or foraging would be mitigated by targeted pre-construction surveys to identify up to date lek areas within 750 m of construction activity immediately prior to construction commencing and specific construction control measures implemented to minimise disturbance for any leks within this area. Potential displacement of waders during construction would be mitigated by a Bird Protection Plan (BPP). Habitat management via the BEMP is proposed to mitigate potential effects of displacement of black grouse and wader species during operation of the wind farm.

3 BIODIVERSITY ENHANCEMENT AREA

The OBEMP proposes a BEA comprising two Management Units (Units A and B) (Figure 7.11) within which management and monitoring works would be implemented.

The BEA covers a total area of 418.2 ha. Details of each management unit are included below in Section 3.1.

[2] https://www.nature.scot/doc/naturescot-research-report-1283-disturbance-distances-review-updated-literature-review-disturbance

The overall goal of the BEMP is to restore and enhance the ecological value of upland, woodland and riparian habitats which will benefit black grouse, local wader populations and biodiversity in general.

The precise objectives and management prescriptions for the Management Units will depend on the current state of the habitat and the factors acting upon it. In order to inform these objectives and detail appropriate management prescriptions further surveys are required to be undertaken in developing the final BEMP, these data can also be used to help inform the baseline conditions. These surveys may include, but are not limited to, the following:

- National Vegetation Classification (NVC) surveys of areas not already mapped (part of Management Unit A which was out with the Site boundary and survey area required to inform the impact assessment);
- Relevant peatland condition assessments in line with Peatland Action guidance[3];
- Common Standards Monitoring of Upland Habitats[4];
- Hydrology walkover to identify opportunities for drain blocking and restoration of the peatland water table;
- Use of 5 m Digital Terrain Model (DTM) to determine slope and number of drains required;
- Herbivore Impact Assessment (HIA) using methodology from SNH[5];
- Peat depth surveys to complete phase 1 coverage of Management Unit A;

3.1 Management Units

3.1.1 Management Unit A

Management Unit A is 415 ha and comprised of predominantly marshy grassland, with a mosaic of other upland habitats including unimproved acid grassland, blanket bog and wet modified bog.

Within suitable locations in the management area, the aim is to enhance peatland habitat, and improve the suitability of grassland habitats for curlew and other wader species, via measures including drain blocking, restoring eroded areas, and bracken and rush control (notably around Glen Burn and Birk Burn).

Peatlands are important for preventing and mitigating the effects of climate change, preserving biodiversity and minimising flood risk. In the south-east of the Site, there are areas that have been categorised as Class 1 or Class 2 peatland (Figure 7.2). Field surveys noted areas of peat hagging and erosion (Appendix A7.1), which can also be seen via aerial imagery, and suggests that there may be opportunity for rewetting of the peatland through ditch blocking. This would encourage bog species to recolonise and promote peat formation in these areas. Signs of drainage ditches can also be seen in the wider management unit, such as in the south-west corner. Some of these

[3] NatureScot Peatland Action (2021). Peat Depth and Peatland Condition Survey. Available at: Peat Depth and Peatland Condition Survey (nature.scot) [Accessed May 2023]

[4] JNCC. (2009). Common Standards Monitoring Guidance for Upland Habitats. Version July 2009. ISSN 1743-8160.

[5] SNH (1998a). A Guide to Upland Habitats – Surveying Land Management Impacts – Volume 1. SNH (1998b) A Guide to Upland Habitats – Surveying Land Management Impacts – Volume 2.

signs coincide with areas of blanket bog or wet modified bog, as identified in the course of baseline surveys, and as such would also benefit from restoration.

To further enhance biodiversity at the Site, low density riparian planting of native broadleaf species would be carried out along suitable watercourses within the management area (where peat depth <0.5m and botanical conditions are suitable (avoidance of sensitive GWDTEs[6])). Watercourses within the Site form part of the River Nith catchment of the Solway Tweed river basin district and are currently largely free of shrubs and trees, particularly towards the higher altitudes.

Riparian planting will enhance biodiversity at the Site by improving the ecological quality of watercourses (allochthonous material inputs, thermoregulation, erosion reduction), create shelter opportunities for otter (*Lutra lutra*), establish improved habitat corridors (including for black grouse), provide shading to watercourses and aiding in temperature regulation and cover for fish, as well as provide visual screening of turbines from species using the watercourses. From a hydrology perspective, riparian woodland planting is considered beneficial for natural flood management by intercepting rainfall, improving bank stability, increasing evaporation and uptake by vegetation and infiltration. The River Nith is shown on SEPA indicative mapping[7] as having a localised 10% chance of flooding annually, therefore riparian woodland planting along the watercourses upstream would potentially benefit natural flood management in the catchment. The Phase 1 peat depth survey results suggest that there are suitable areas which would lend themselves to such planting; e.g., McTurk's Gutter, Birk Burn, southern tributaries of Glenlarie Burn.

Further surveys would determine suitable refined areas within Management Unit A for peatland restoration, grassland enhancement and riparian planting.

3.1.2 Management Unit B (Glenmaddie)

Management Unit B is 3.2 ha and comprised of mainly semi-improved grasslands, with areas of marshy grassland. The area is bordered by broadleaved semi-natural woodland on three sides, with large stands of continuous bracken along the woodland boundaries. Although a native species, bracken can become problematic, inhibiting grasslands and woodland regeneration. Management Unit B is located within 750m of a black grouse lek identified in the course of the baseline ornithology surveys.

Within the management area the aim is for expansion of broadleaved woodland and improvement in habitat suitability for black grouse. Natural regeneration of woodland would be encouraged along the existing woodland edges, by bracken control, as well as through planting small areas of low-density native broadleaf species across the management area. Native hedgerows would be planted along the edges of the track which runs through the management area to Glenmaddie farm buildings; this would provide screening of the road from the surrounding habitats, and a sheltered corridor for use by numerous species (including bats) for commuting and foraging. Planting of low-density woodland, along with managing grazing to produce a more varied sward height, would improve habitat suitability for black grouse. Management of the habitats in this way would also benefit barn owl, which are known to be nesting in the area. Woodland fringe and black

[6] https://forestry.gov.scot/publications/117-briefing-note-18-publication-of-gwdte-practice-guide
[7] https://map.sepa.org.uk/floodmaps

grouse are 'high focus' habitat/species identified by the Galloway and Southern Ayrshire Biosphere.

An increase in the area of broadleaved woodland and hedgerow will enhance biodiversity through providing habitat and connectivity for a variety of birds, insects and mammals, as well as mitigating the effects of climate change.

4 AIMS, OBJECTIVES AND MANAGEMENT PRESCRIPTIONS

The Aims define the general BEMP goals, and the related Objectives further define the Aims into quantifiable targets. The Prescriptions detail the indicative management works to be implemented to achieve these Aims and Objectives. Annex A provides an indicative timetable for the implementation of the various Prescriptions.

As discussed in Section 3 above, detailed appropriate Objectives and Prescriptions will be developed post-survey for the final BEMP based on survey findings. However, the experience gained from providing and delivering plans for similar upland sites and peatland habitats would suggest that as an outline the Aims, Objectives and Prescriptions would likely include or be similar to the below.

4.1 Aim 1: Restore and enhance peatland habitat (Management Unit A)

Objective 1.1	Increase the abundance and distribution of major peat forming species, particularly Sphagna (particularly key blanket mire indicator species such as *Sphagnum papillosum* and *S. medium*).
Prescription 1.1	Dam active drains[8] (even if vegetated) in order that the water level is raised sufficiently to create conditions suitable for species mentioned within Objective 1.1. This should be carried out under the supervision of a suitably qualified ECoW. As detailed within the guidance, this technique requires donor peat turves to be excavated adjacent to the drain and then keyed into the drain itself. The divot formed by excavating the donor turve is then infilled by pulling and compressing the surrounding peat and peatland vegetation into this area – the donor turve is taken from alternate sides to avoid a line of restored divots forming long one side of the drain. The reason the donor turve needs to be taken adjacent to the drain is to ensure it retains its consolidated structure which enables its reliable use in damming the drain
Prescription 1.2	The following activities would be prohibited within the Management Unit: • clearing out of existing ditches; • application of any insecticides, fungicides or molluscicides; • application of lime or any other substance to alter the soil acidity; • cutting or topping of vegetation except to control injurious weed species or to improve the biodiversity of the habitat; • burning of vegetation or other materials; • use of roll or chain-harrow;

[8] According to methodology detailed in: Peatland Action (2022) Technical Compendium. Available at: https://www.nature.scot/doc/peatland-action-technical-compendium [Accessed May 2023]

- planting trees;
- carrying out any earth moving activities;
- use of off-road vehicle activities with the exception of use of low scale agricultural vehicle movements (quad bike and land rover) or low impact vehicles;
- construction of tracks, roads, yards, hardstandings or any new structures (not associated with the Proposed Development); and
- storage of materials or machinery.

4.2 Aim 2: Enhance habitats for waders (Management Unit A)

Objective 2.1	Maintain and increase the numbers of breeding pairs of curlew and lapwing from baseline (between 10-17 and 2-5 territories in 2019 respectively).
Prescription 2.1	Where a tall, dense (>30 % rush cover) sward of rushes has established, cut rushes to create a more open habitat, baling cuttings for removal to avoid ground smothering[9].
Prescription 2.2	Control bracken in Management Unit A.

4.3 Aim 3: Enhance the ecological and hydrological value of watercourses (Management Unit A)

Objective 3.1	Establish new riparian woodland and scrub (approximately along 2 km of watercourse – to be confirmed by additional survey).
Objective 3.2	Visually screen and shade watercourses with suitable trees and shrubs to aid in temperature regulation and mitigate potential visual impacts on riverine species.
Objective 3.3	Stabilise river-banks, maintain or improve water quality, and reduce flooding risks along sections of watercourse suitable for planting.
Prescription 3.1	Plant low density native broadleaf species along the banks of watercourses in line with guidance from SEPA[10] and the Woodland Trust[11]. Tree tubes should be used and low impact ground preparation techniques such as screefing or inverted mounding.

4.4 Aim 4: Increase area of broadleaved woodland and hedgerow, and enhance habitat for black grouse (Management Unit B)

Objective 4.1	Establish new broadleaved woodland in suitable areas within Management Unit B (to be confirmed by additional survey).

[9] In line with: Farm Advisor Service (FAS) (2017). Management and Conservation for Farmland Waders. Technical Note TN688.
[10] SEPA (2009). Engineering in the Water Environment Good Practice Guide. Riparian Vegetation Management. Second Edition. WAT-SG-44.
[11] Woodland Trust (2016). Keeping Rivers Cool: A Guidance Manual. Creating riparian shade for climate relief adaptation.

Objective 4.2	Create approximately 300 metres of new species-rich hedgerow[12].
Objective 4.3	Improve habitat suitability for black grouse.
Prescription 4.1	Planting small areas of low-density native broadleaf species across Management Unit B. To comprise areas of birch, willow, hawthorn, rowan, and alder, with uneven woodland edges to maximise the edge preferred by black grouse[13].
Prescription 4.2	Control bracken on existing woodland fringes to allow natural expansion of woodland and scrub.
Prescription 4.3	Plant approximately 300m of new native species-rich hedgerow along farm track, using appropriate species[12].
Prescription 4.4	Manage rough grazing to create a sward with some areas of over 30cm in height to provide a mosaic of open and dense vegetation for black grouse[13].

5 MONITORING

5.1 Aim 1: Restore and enhance peatland habitat (Management Unit A)

The following monitoring would be undertaken to evaluate the success of this aim:

- Habitat monitoring will evaluate the success of restoration and enhancement of peatland. This will be achieved by recording changes to the structure and composition of the vegetation and species abundance, evenness and diversity. Recording of impacts from deer/livestock will also be included in the monitoring programme, using the HIA methodology described in SNH guidance[5] at a landscape scale.

  A representative sample of permanent quadrats will be established within Habitat Management Unit A to gather sufficient data to inform future management and assess the trajectory of plant species and habitats. The respective monitoring surveys will be carried out at the most appropriate times of year (e.g. flora surveys versus browsing impact surveys). Repeat surveys will be carried out in the same month in each monitoring year (1, 2, 3, 5 10, 15) to gather comparable data. Photographs will also be taken of each sample quadrat, as well as overview photographs of the management unit. The final detailed methods will be agreed with the HMG.

- Any installed peat dams or reprofiled haggs will be monitored to ensure works are successful over the first three years after works are completed. Remedial measures will be undertaken if restoration works have failed.

[12] In line with Scottish Government (2017). Supporting guidance for Planting or Replanting of Hedges. Available at: https://www.ruralpayments.org/topics/all-schemes/agri-environment-climate-scheme/management-options-and-capital-items/planting-or-replanting-of-hedges/guidance-for-planting-or-replanting-of-hedges/ [Accessed May 2023]

[13] FAS (2018). Technical Note TN711. Black Grouse Management on Farmland.

5.2 Aim 2: Enhance habitats for waders (Management Unit A)

The following monitoring would be undertaken to evaluate the success of this aim:

- Breeding Bird Surveys (BBS) will be undertaken in years 1, 2, 3, 5, 10 and 15 to determine the distribution of territories for target wader species.
- Habitat monitoring for grassland in line with the approach detailed above for Aim 1.

5.3 Aim 3: Enhance the ecological and hydrological value of watercourses (Management Unit A)

Planted areas will be monitored for the first five years following planting to ensure successful establishment. Trees will be inspected by suitably experienced personnel and evidence of damage (e.g. browsing by deer) or disease will be recorded. Where necessary, failed trees should be replaced in the winter following the inspection (i.e. November to March). Presence of any invasive non-native species will also be a focus of the inspection, with any specimens recorded being removed in a timely and appropriate manner.

5.4 Aim 4: Increase area of broadleaved woodland and hedgerow, and enhance habitat for black grouse (Management Unit B)

The following monitoring would be undertaken to evaluate the success of this aim:

- Black grouse surveys will be undertaken in years 1, 2, 3, 5, 10 and 15 to monitor success of planting for black grouse.
- Habitat monitoring of planted areas in line with the approach detailed above for Aim 3.
- Habitat monitoring of woodland fringes to ensure bracken control is undertaken appropriately and monitor natural regeneration of woodland species (years 1, 2, 3, 5, 10, 15).

ANNEX A. MANAGEMENT AND MONITORING TIMETABLE

Table A-1 Management and Monitoring Timetable

Activity	1*	2	3	4	5	6	7	8	9	10	11	12	13	14	15...
Drain blocking and hagg reprofiling (Management Unit A)	✓														
Native broadleaf Planting (Management Units A and B)	✓														
Native hedgerow planting (Management Unit B)	✓														
Rush management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bracken control	✓	✓	✓		✓			✓			✓			✓	
Grazing management (if required) (Management Unit B)	Throughout lifetime of BEMP														
Excluded activities (Management Units A and B)	Apply from the commencement of construction														
Habitat monitoring (including HIA) (Management Units A and B)	✓	✓	✓		✓					✓					✓
Peat dam inspections (Management Unit A)	✓	✓	✓												
Planted tree/hedgerow inspections (Management Units A and B)	✓	✓	✓	✓	✓										
Reporting to BMG	✓	✓	✓	✓	✓					✓					✓
BBS and Black grouse surveys (Management Units A and B)	✓	✓	✓		✓					✓					✓

* First year after final commissioning of the Proposed Development

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