Gortloughra Wind Farm

Habitat Management Plan (HMP)

Doherty Environmental Consultants Ltd.

Revision 0, March 2025

Gortloughra Wind Farm

Habitat Management Plan

Document Stage	Document Version	Prepared by
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CONTENTS

1 Introduction

Doherty Environmental Consultants (DEC) Ltd. have been commissioned by Gortloughra Wind Farm Ltd. to prepare a Habitat Management Plan (HMP) for the proposed Gortloughra Wind Farm in Co. Cork.

This HMP has been prepared for lands occurring within the temporary construction footprint of the Gortloughra Wind Farm Site Redline boundary, that does not fall under the permanent wind farm infrastructure footprint. Additional lands that are the subject of the habitat management actions set out in this HMP, located outside the construction footprint of the wind farm, are situated to the northeast of the wind farm site. These lands consist of an area of heathland to the north of Shehy More. The location of both areas are shown on Figure 1.1. The target habitat occurring in the HMP Management Lands are wet heath and montane heath habitat.

The lands occurring within the temporary construction footprint of the Gortloughra Wind Farm site that will be subject to habitat management measures are referred to throughout the remainder of this Plan as the HMP Restoration Lands.

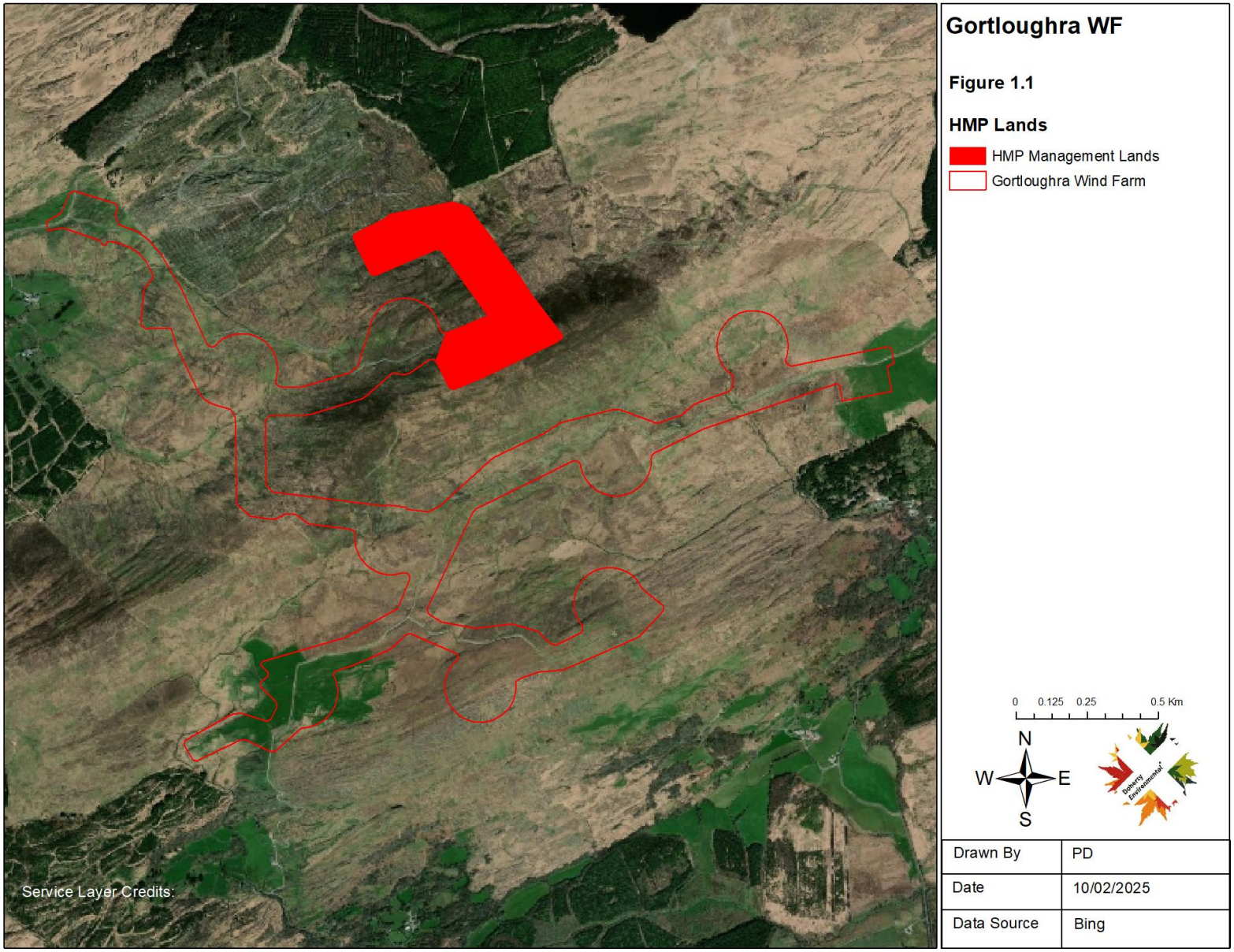
The parcels of land to the northeast of the wind farm site construction footprint (referred to hereafter as the HMP Management Lands) that will be targeted for habitat management of wet and montane heath habitat as shown on Figure 1.1 will amount to approximately 20 Ha.

The HMP Management Lands and HMP Restoration Lands will be managed throughout the lifetime of the wind farm with a view to restoring and maintaining wet and montane heath habitat that corresponds to structure of Annex 1 quality wet heath.

It is noted that none of the lands currently included in the c. 20 Ha of HMP Management Lands are managed under any nature conservation schemes, and thus there are no restrictions to land management practices, which is evident by virtue of excessive livestock grazing pressure, throughout the Site, in within areas of lower elevation and level ground within the HMP Management Lands. The implementation of this HMP as part of the overall Gortloughra Wind Farm project provides an opportunity to manage and conserve the area of wet and montane heath habitat occurring within the HMP Management Lands, as well as the HMP Restoration Lands for the lifetime of the Proposed Development.

The wind farm operator will, throughout the lifetime of the wind farm, ensure the implementation of the actions specified within the HMP. Pursuant to the terms and conditions

of the lease agreements on site, the landowners must comply with all necessary actions and precautions required by the wind farm operator for the implementation of this HMP.


Gortloughra WF
Figure 1.1
HMP Lands
HMP Management Lands
Gortloughra Wind Farm
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Date 10/02/2025
Data Source Bing

2 Purpose of the HMP

The purpose of this HMP is to provide detailed descriptions of the locations, methods and activities of habitat restoration and maintenance that will:

a) restore wet and montane heath within the HMP Restoration Lands that consist of lands associated with the temporary construction footprint around infrastructure elements of the Proposed Development;
b) maintain and/or restore areas of heath occurring within the HMP Management Lands so as to compensate for the loss of heath habitat to the footprint of the Proposed Development.
c) maintain and/or restore heath habitat conditions within the HMP Management Lands that are favourable for red grouse and other ground nesting bird species (such as meadow pipit and skylark).

In order for this HMP to be meaningful, the aims and objectives of habitat restoration and management for each part of the Site are described. This is necessary to:

a) make sure that expectation levels for the quality of legacy habitat are realistic; and
b) ensure that post habitat restoration monitoring is adequately prescribed.

The implementation of the HMP will mitigate for the loss of habitats to the Proposed Development and will provide for a net increase in the extent of heath habitat at favourable conservation condition.

3 Scope of HMP

The HMP sets out the following:

1. Details of habitat management area;
2. Details of regular monitoring of habitat management measures using fixed quadrat locations;
3. Appropriate maps, clearly identifying habitat management areas;
4. Detailed methodology and prescriptions of habitat management measures, including timescales and with defined criteria for the success of the measures; and
5. Details of the production of regular monitoring reports to be submitted to the Planning Authority at years 1, 2, 3, 5, 7, 10, 15, 20, 25, 30, 35 & 40 which will include details of contingency measures should monitoring reveal unfavourable results.

4 Description of Gortloughra Wind Farm & HMP Management Lands

4.1 Overview of Location & Existing Land Cover

4.1.1 General Site Description

The Site is located 9.7 km north-west of Dunmanway, Co. Cork and 19 km south-east of the county boundary between Cork and Kerry. The Site is located on relatively high ground, at elevations ranging from 243 m AOD on the northern side of the site at the entrance 326 m, to 510 m AOD towards the middle of the Site and 306 m AOD on the southern side of the Site.

The southern extent of the Site is located within the townland of Shehy Beg. To the south and south-east of the site are the townlands of Shanacrane West and Tooren respectively.

To the north of the Site there are additional areas of blanket bog, forestry, Douce Mountain, Lough Nambrackderg, pre-existing Shehy More Windfarm and the townlands of Shehy More, Cloghboola, Derryriordane South and Inchiroe. To the east of the site is the townland of Coolmountain and additional areas of forestry.

To the west and south-west of the Site are the townlands of Gortloughra, Coomclogh, Glanycarney, the Cousane Gap and the R585 road. The wider area surrounding the Site is rural in nature with low intensity agriculture in the form of pastoral grassland, peat harvesting and commercial forestry plantations being the predominant land use.

The topography of the Site is mountainous and undulating with slopes locally recorded up to 30° at some probe locations. The turbines are generally located on areas of moderate slope (typically less than 10°, although locally slopes do exceed 10°) and with low peat depths (typically less than 0.5 m). Due to the slope of the ground, little ponding was observed, however most of the peat was saturated during the field surveys.

The Site forms part of the southern fringes of the Shehy Mountains and is therefore generally elevated in nature. The highest peak at the site is Shehy More (546 m OD) which broadly divides the northern and southern sections of the Site. To the north of the Site is Douce Mountain (474 m OD), in between Douce Mountain and Shehy More is a valley through which the L8544 local road traverses and which forms part of the northernmost extent of the Site. The northern portion of the site ranges in elevation from 200 m OD with increasing steeper inclines existing to the south as far as the summit of Shehy More at 546 m OD.

The southern face of Shehy More is also steep with elevations reducing rapidly from 546 m OD to 400 m OD across an approximate distance of 300 m. The southernmost extent of the Site ranges in elevation from approximately 250 – 300 m OD. Further south beyond the Redline Boundary, the topography is generally flat in the townland of Shanecrane East at an elevation of approximately 120 m. To the west of the Site beyond the EIAR boundary is Carrigmount with an elevation of 342 m OD. To the east and south-east of the Site there are peaks ranging in elevation from 312 m OD, 332 m OD and 375 m OD and the Cousane Gap through which the R585 regional road traverses.

4.1.2 Review of Historical Mapping

The first edition 6-inch map of 1841 and the last edition 6 inch map from 1904 shows the wind farm site to be unenclosed. The watercourses for Shehy Beg, Shanacrane and Gortloughra are shown on the historic maps.

A comparison of the aerial imagery between 1995 and current google satellite imagery shows little change in land cover in areas to the north of the Shehy Beg Mountain ridgeline. The most significant changes in land cover in this 30 year period are apparent to the south of the ridgeline.

The 1995 and 1999 orthophotography shows the presence of tracks to the southwest of Shehy Beg Mountain ridgeline. The 2001 to 2005 imagery shows an extension of the track from the southwest, east towards the location of proposed T04 turbine. A comparison between the 1995 – 1999 and 2001 – 2005 imagery suggests the provision of new drainage channels between these years to the west of the site in the area that is now comprised of improved agricultural grassland. At the time of the 2001 – 2005 imagery this area consists of rough grazing with new drainage channels and the aforementioned track. No improved agricultural grassland is present to the east of the Site (surrounding the proposed wind farm Onsite Substation and Control Building location). Conifer plantation is depicted as present for the first time to the east of the Site on the 2001 – 2005 imagery.

The 2013 – 2018 imagery shows the extension of the existing access track from the west to the east with a connection made with the track network to the east that eventually leads south to the public road network. By the time of the capture of this imagery, improved agricultural grassland was established to the east of the wind farm site surrounding the proposed T06 location and the west of the site surrounding the proposed substation location. Additional forestry was also planted by this time to the east of the Site.

4.2 Existing & Past Site Management

The dominant land use at the Site is for livestock grazing with both cattle and sheep. Sheep are the dominant livestock on heath and grassland habitats dominating the land cover within the Site. Past burning of upland heath habitat may also have been practiced within the Site. This is indicated by the over-dominance of Molinia caerulea within much of the Site. The Molinia swards dominating the cover in much of the Site and surrounding lands are characterised by dense and tussocky Molinia with a thick litter layer. This sward is considered to be representative of the Irish Vegetation Classification HE4D community Molinia caerulea – Potentilla erecta – Erica tetralix. This community is on average species-poor is aside from its natural occurrence as a type of poor flush habitat, the expansive examples of this community on drier ground tends to develop due to negative land use activities such as overgrazing by sheep or burning.

Both burning and excessive grazing are known to result in a decrease in ericoid cover and an increase in gramminoid cover and especially Molinia. Grazing pressure is currently considered to still exert a pressure on the favourable conservation status of heath habitat within the Site.

5 Habitat Restoration & Maintenance

Habitat restoration and maintenance will be achieved within the HMP Management Lands by securing landowner agreements on stock removal/management and avoidance damaging land management practices such as burning.

Gortloughra Wind Farm Ltd. will work with the current landowners to manage areas of heathland within the HMP Management Lands so as to restore and/or maintain these lands at good conservation status for at least the lifetime of the Gortloughra Wind Farm Development, which is predicted to be at least 40 years.

The techniques for habitat restoration/maintenance that will be implemented will comprise:

- **Restoration of heath vegetation around the development footprint after construction.** Habitat restoration will be targeted at areas of the temporary construction phase footprint in order to reinstate heath habitat. Techniques for restoration of heath will be implement for the HMP Restoration Lands
- **Stock Management.** Gortloughra Wind Farm Ltd. will work with landowners to improve general land management and grazing regimes.

- **Fencing.** Fencing will be provided both during the construction and decommissioning phase and the operation phase of the wind farm site to promote heathland restoration and ongoing management.
- **Management Agreements with landowners** to prevent any ongoing damaging land management practices.
- **Targeted red grouse habitat management measures** to promote favourable habitat condition for red grouse and other ground nesting bird species within the HMP Management Lands.

5.1.1 Restoration of Vegetation in HMP Restoration Lands

Habitat restoration will be targeted along the sections of the temporary construction phase footprint within areas of existing heath habitat and heath habitat mosaics that do not form part of the permanent wind farm infrastructure footprint.

In all areas where vegetation is stripped ahead of the construction of access tracks, turbine bases, crane hard standings, and cabling and borrow pit for the Gortloughra Wind Farm, there is the need to restore vegetation after the construction activities have been completed. The prime aim of the restoration of vegetation within the wind farm footprint is to re-vegetate bare soil denuded during construction works so as to stabilise them, prevent erosion and to reinstate heathland vegetation.

5.1.2 Methods of Heathland vegetation restoration in HMP Restoration Lands

Heathland vegetation cover around the construction footprint will be restored by re-turfing with intact vegetated heath turves, saved at the time of turf stripping in areas of heath habitat. It is expected that sufficient heath turves will be saved during vegetation stripping to provide reinstatement turve cover for the temporary construction footprint. Notwithstanding this, in the event that the area of turves saved from heath habitat within the wind farm footprint is not sufficient to restore habitat within the construction footprint then the restoration will be supplemented by over-seeding using locally collected heather brash or heather seed. Furthernore overseeding of re-turved heathland areas may provide useful enhancement to bolster heathland vegetation established in re-turved area. The need for over-seeding of any re-turved areas will be made by the ECoW once the initial turf replacement has been completed.

Careful stripping and replacement of turf is usually the best option for restoring around infrastructure because it permits restoration of a near full range of plant community species and possibly elements of the invertebrate fauna. It may also produce more rapid results as it largely

involves vegetative regrowth of established plants. The quality of vegetation restoration depends very much on the quality of turf storage and the care taken during the replacement of turves.

Four main activities will be carried out to ensure that the restoration is effective and that vegetation is restored as quickly as possible. These are:

- Careful stripping of vegetation turves;
- Storage of intact turves close to their point of origin for as short a period of time as possible;
- Careful reinstatement of turves, with additional heather seeding where suitable; and
- Monitoring of reinstated vegetation.

Each activity is described in more detail below. Monitoring is described in Section 6.

5.1.2.1 Careful Stripping of Vegetation Turf

Ahead of the construction of turbine bases and cut sections of access tracks, the vegetation will be stripped in intact turves, ideally in large sections using plant such as the bucket of a tracked excavator. The turves shall be large in area (ideally around 0.5m x0.5m) and as deep as the surface soil organic horizon. The depth of turves should be 30cm (where such depths occur) to ensure that the turves stay moist and intact during handling and storage. It is noted that thin soil/overburden layers occur throughout the site and where the depth is less than 30cm than as per the above the turve will be stripped to bedrock level. This approach to turve stripping will assist their successful reinstatement. To ensure careful work, an excavator machine operator with past experience of turve stripping works, will be required to be used for this task and that all drivers are trained to meet this requirement.

For the excavation of cable trenches within heath habitat, the method for turf stripping and excavation will ensure that sections of cable trench (e.g. 500m sections) are excavated, laid and restored as quickly as possible and that the cable trench is not left open across the site and restored in one activity. This will allow the most rapid reinstatement of heath vegetation.

5.1.2.2 Storage of intact turves

Stripped turves shall be stored as close to their point of origin and for as short a period of time as possible. In the case of turbine bases this is likely to be of the order of weeks, but for cable trenches it will be in the order of days.

The method of storage will be such that turf stripped from areas of heath habitat is stored vegetation side up to a maximum of two turf heights.

To ensure good conservation and to retain moisture status of turves during storage, particularly in dry weather when desiccation can occur rapidly, they may require periodic watering, or they will be covered (plastic sheeting) as determined by the ECoW, particularly if storage includes any longer spells of hot, sunny and windy weather.

5.1.2.3 Habitat restoration using stored turves

The aim will be to restore habitat around the footprint of all temporary construction areas to heath vegetation type using stored turves initially stripped from these areas and the area of permanent wind farm infrastructure footprint.

Where the access track is constructed as a 'cut' track, it will be ensured that the access track verges and the cable trench will be constructed in such a way as to minimize the disturbance of stripped vegetation. This approach will involve vegetation restoration on the road verge and over the cable trench as a single process after all the construction work has been completed.

Habitat restoration around batters of turbine bases, crane hardstandings and sections of cut access track will be achieved by:

(a) ensuring sufficiently shallow batter gradients to prevent soil erosion;

(b) careful levelling and firming of subsoil to the correct density to minimise the risk of uneven settlement; and

(c) by careful replacement of turves, butted close together and well tamped into place, so that they will not easily erode. Any unavoidable gaps shall be filled with loose soil and brash and well tamped.

The quality of restored areas will be checked by the ECoW immediately after completion to confirm that turf reinstatement has been carried out correctly. Subsequent checks and monitoring of restored areas are described in Section 6.

Habitat restoration of cable trenches will be completed as soon as sections of trench, 500m long, are completed and back-filled. To ensure successful restoration of vegetation along cable

trenches, and to ensure that trenches do not become routes of preferential flow for drainage waters, trenches will be designed with cross dams and back-filling and re-turfing will take place immediately after cables have been laid. Appropriate scale plant will be used for these activities to minimize as much as possible the trafficking of adjacent peat.

Should areas of replaced turf require overseeding to thicken up vegetation regeneration, the method will follow that described in Section 5.4.4 below.

5.1.2.4 Habitat Restoration using Brash

In the unlikely event that there is a short-fall in the saved turves required to restore heath habitat within the temporary construction footprint, heather brashing will used as a remedial measure to substitute for this short-fall. Heather brashing will also be used as the primary restoration technique on areas of steeper battered slopes where turves are at greater risk of erosion.

The techniques that can be implemented to achieve the colonisation of these slopes with *Calluna vulgaris* include the application of heather brash/chopper material using a scatter roller; hydroseeding of the slope; and or the application of seed and geojute/netting[1] to stabilise and protect the surface during vegetation establishment. Brash/chopper material and seed material to be used for seeding steeper slopes will be harvested from local stands of heather. Harvesting will be undertaken in line with the method outlined in Section 5.1.6 below.

The final approach to be used for the establishment of *Calluna vulgaris* swards on steeper slopes will be selected by the ECoW in consultation with a landscape specialist.

5.1.2.5 Heather Seeding

Within the landholding boundary, on the north facing slopes of Shehy More *Calluna*-dominated vegetation is in generally good condition and supports stands of mature heather. These areas will also act as donor areas of heather seed for any re-seeding and over-seeding of heath re-instatement areas within the temporary construction footprint.

[1] Salmon smolt netting has been successfully used for stablisation of seed during blanket bog restoration in Scotland: see https://www.iucn-uk-heathlandprogramme.org/sites/www.iucn-uk-heathlandprogramme.org/files/file_attach/Session%208%20Combined%20Workshop%20Presentation.pdf

Under the guidance of the ECoW, small areas with mature *Calluna vulgaris* will be selected for mowing. This will involve an inspection of the area to select the best and most easily accessible areas as donor locations for collection of heather seed for re-seeding elsewhere. These areas will display signs of mature and 'leggy' heather stands in need of regenerating and display good seed production. It is noted that the collection of seed from such stands of heather will not result in any adverse impacts to the existing heather stands and will facilitate rejuvenation of the existing stands of donor heather.

Heather seed is very small and can be produced in great abundance. Heather seed does not ripen until about October, depending on weather conditions. Germination requires light, warmth and moisture, so seed collected in the autumn is best sown in the spring. Most germination usually occurs in mid to late summer. If conditions are unsuitable, seed will remain dormant and can persist in the seedbank for decades although viability varies greatly according to site conditions.

In order to use locally-sourced heather seed for both revegetating areas of bare ground and enhancing re-turved areas, a programme of heather seed collection, using brush harvesters, will be conducted on suitable areas of heather moorland in the north-eastern part of the site. Brush harvesters can be deployed as rear and side-mounted brush harvesters, tractor-trailed, ATV-trailed and pedestrian brush harvesters. For the purposed of heather seed collection at Gortloughra, the equipment to be deployed will be a combination of either quad-bike ATV-trailed harvesters and pedestrian harvesters. This will avoid the use of heavy machinery on site and the compaction of underlying peat en route to donor locations.

A number of component tasks will be carried out and managed by the ECoW. These tasks will include as a minimum:

- Inspection of all areas of heather moorland in the north-east of the site to identify and select suitable donor locations for heather seed. Likely areas suitable for seed collection will be accessible and will display signs of mature and 'leggy' swards showing good flowering characteristics. This inspection and selection will be carried out by the ECoW;
- Plan suitable storage facilities for both heather brash and heather seed (if required) so that harvested materials can be suitably conserved until it is deployed in habitat restoration and enhancement works; and

- If there are any bare patches in restored areas within the Gortloughra Wind Farm site boundary, implement heather seed spreading on a location-by-location basis, as indicated below and as directed by the ECoW.

Ahead of heathland habitat restoration/enhancement works elsewhere on site, the ECoW will plan and supervise a targeted heather seed collection programme in the northeast of the site. In line with the requirements of the Wildlife Act and the breeding bird season, heather flailing must not be carried out during the period 1st March to 31st August to protect ground-nesting birds.

Donor seed will be harvested at the optimum time of year, from October through to December. This timing is outside the nest bird period as well as being outside the time of year when male red grouse begin to establish breeding territories (i.e. late February and March).

Suitable dry storage facilities for both heather brash and heather seed will also be planned so that harvested materials can be suitably conserved and protected from wet conditions until they are deployed in habitat restoration works.

5.1.2.5.1 Seed Application & Management

Heather reseeding shall take place in late spring (late April to May) to allow warmth and moisture conditions of early summer to optimise germination. A sowing rate of 15 – 17kg per hectare, with repeated applications over several years, will be required as part of the habitat restoration.

Regrowth of competitor vegetation must be reduced during the establishment phase by one or a combination of the following management actions:

- Topping
- Controlled grazing; and/or
- Weed wiping

The inclusion of seeding of areas with heather seed, as a remedial measure in the unlikely event of a short-fall in turve cover and or bare patches occurring within the temporary construction footprint to be reinstated, will contribute towards the re-establishment of heath vegetation in these reinstatement areas of the Gortloughra Wind Farm site

5.1.3 Stock Management of HMP Management Lands

Stock management of both sheep and cattle will be agreed between Gortloughra Wind Farm Ltd and landowners. The HMP target habitats of wet and montane heath and poor fen will benefit from stock management.

Within the HMP Management Lands there will be complete removal of sheep from the HMP Management Lands during the construction phase and for the following three years. Thereafter, the rate of sheep stocking will be restricted to a sheep-only stocking rate of 0.3 livestock units per hectare between 1 March to 31 October. No grazing will be permitted outside of this period.

Records will be kept of initial habitat condition, current and historical stocking densities will be compiled and maintained for the duration of stock management and grazing restrictions.

5.1.4 Fencing

Stock proof fencing will be installed around the boundary of the HMP Management Lands. The integrity of the stock proof fencing will be monitored and maintained throughout the lifetime of the HMP.

5.1.5 Management agreements with landowners

Under the terms of their lease with the respective landowners, Gortloughra Wind Farm Ltd. will prevent ongoing damaging land management practices within the HMP Management Lands during the lifetime of the Proposed Development. In this respect, there will be:

- no overgrazing (grazing on site will be in line with the stocking rates specified in Section 5.1.8 above);
- no new drainage and no maintenance of existing drains, with the exclusion of drains designed to protect the development's infrastructure;
- no flailing or mowing (with the exception of any flailing or mowing designed specifically for habitat enhancement as part of the wind farm development).

5.1.6 Red Grouse Habitat Management

Red Grouse require a broad age-range of heather to allow for cover, shelter, nesting and feeding. Hens usually nest in mature heather adjacent to freshly cut/burnt or second year cut/burnt heather, where fresh shoots will be available for chicks. This improved micro-

climate is beneficial to the reproduction of invertebrates which are a vital food source for chicks. A patchwork of old and new heather is widely considered as the best management practise for Red Grouse.

Intentional heather burning will be prohibited within the HMP Management Lands. As such in lieu burning targeted cutting (e.g., using a hand-held strimmer) of short, 10 m wide strips in areas with Heather growing at heights of 30 cm or more will be undertaken throughout the operation phase of the wind farm. The project ecologist for the operation phase will be required to carefully assess the cutting requirements on an annual basis and will also be required to monitor the effectiveness of this action. The rotation period for cutting will be determined by the rate of Heather re-growth, identified through ongoing annual monitoring. All cutting operations associated with this action will be carried out from October to March inclusive, with only a relatively small area cut at any one time and cut strips left surrounded by taller Heather. The proposed cutting will be monitored by an ecologist to avoid adverse effects to habitats and species.

The habitat management measures described above for heath habitats are also applicable to habitat management for Red Grouse. In particular, management of heath will be required to maintain heath vegetation in favourable condition for nesting, foraging and sheltering for Red Grouse.

In addition to the above and to further enhance conditions for red grouse within the HMP Management Lands as well as within the wind farm site there will be a prohibition of any shooting within the wind farm site and the HMP Management Lands.

Furthermore all management activity on site, such as cutting (as per the above) will be timed to avoid effects on Red Grouse when they are likely to be most sensitive (e.g., when nesting).

6 Habitat Management Action Plan

Table 6.1 outlines an Action Plan for the promotion and implementation of management actions to manage and enhance heathland habitats within the HMP Restoration Lands and the HMP Management Lands.

The responsibility for the completion of actions are outlined in **Table 6.1**. The implementation of actions during the construction phase will be completed by the main civil contractor.

6.1 Monitoring

To ensure that management actions outlined in **Table 6.2** are achieving the required objectives for each target, regular monitoring is required. **Table 6.2** below lists the monitoring required for each target, the measurement to be recorded, timing and frequency of monitoring and the personnel who shall carry out each task.

This monitoring programme covers the construction period in addition to (as a minimum) years 1, 2, 3, 5, 7, 10, 15, 20, 25, 30, 35 & 40 following the completion of the construction period. Baseline surveys exist for the entire Site, and these will be complemented by confirmatory surveys completed through the construction phase.

Habitat monitoring will be undertaken using quadrats and fixed-point photography.

Monitoring during the early years of the operational phase will be particularly important for evaluating the success or otherwise of management actions to achieve favourable conservation status for heathland habitats.

The Favourable Conservation Status of Heathland Habitats will be based upon the attributes and targets outlined in **Table 6.1**.

Table 6.1: Attributes, Measurements and Targets for Achieving Favourable Conservation Status

Attribute	Measurement	Target
Vegetation Composition	Relevé	Number of bryophyte or non-crustose lichen species present, excluding Campylopus spp. and Polytrichum spp. ≥ 3.
	Relevé	Number of positive indicator species present ≥ 2
	Relevé	Cover of positive indicator species ≥ 50%
	Relevé	Proportion of dwarf shrub cover composed of *Myrica gale, Salix repens, Ulex gall*ii collectively < 50%
	Relevé	Cover of the following weedy negative indicator species: *Cirsium arvense, C. vulgare, Ranunculus repens,* large Rumex species (except *R. acetosa*), *Senecio jacobea, Urtica dioica* collectively < 1%
	Relevé	Cover of non-native species < 1%

Attribute	Measurement	Target
	Local vicinity	Cover of non-native species < 1%
	Local vicinity	Cover of scattered native trees and scrub < 20%
	Local vicinity	Cover of *Pteridium aquilinum* < 10%
	Local vicinity	Cover of *Juncus effusus* < 10%
Vegetation Structure	Relevé	Senescent proportion of *Calluna vulgaris* cover < 50%
	Relevé	Last complete growing season's shoots of ericoids and *Empetrum nigrum* showing signs of browsing collectively < 33% (Assess a minimum of 10 shoots distributed across the plot)
	Local vicinity	No signs of burning inside boundaries of sensitive areas
	Local vicinity	Outside boundaries of sensitive areas, all growth phases of *Calluna vulgaris* should occur throughout, with ≥ 10% of cover in mature phase
Physical Structure	Relevé	Cover of disturbed bare ground < 10%
	Local vicinity	Cover of disturbed bare ground < 10%

Management Actions and techniques outlined in Sections 5 above aim to achieve favourable conservation status of heathland within the HMP Restoration Lands and HMP Management Lands.

Where management actions are not deemed to be successful in achieving the targets for favourable conservation status of heathland and heathland habitat, as outlined in **Table 6.1** above, then the implementation of remedial measures will be required. Examples of these remedial measures are provided in Section 5 above. It is noted that the nature of the remedial action to be applied will be dependent upon which attributes are not meeting the targets of favourable conservation status.

6.1.2 Ongoing Monitoring – Meeting Targets

If a habitat fails to meet one of the targets, then management action as listed in **Table 6.2** will be undertaken.

6.2 Reporting of Monitoring

Table 6.2 specifies the timing of monitoring for each HMP Action.

A report detailing the results of all actions requiring implementation during the construction phase will be furnished to the Planning Authority within 12 months of the completion of construction activity, and subsequently in years 1, 2, 3, 5, 7, 10, 15, 20, 25, 30, 35 & 40.

6.2.1 Quadrats & Fixed-Point Photography

Habitat surveys during the monitoring programme will be based on fixed quadrat surveys. Each quadrat will be surveyed using the DOMIN Scale so that individual vegetation communities are identified. Fixed quadrat monitoring locations will be identified by the ECoW during the construction phase.

Quadrats will be located within all areas of the Site that are subject to the habitat management measures outlined in Section 5 above.

Fixed point photographs will be taken of the vegetation at all quadrats and of the surrounding area during each round of monitoring. The grid reference of the initial fixed point photograph location will be recorded during the initial round of monitoring and the direction of view of photographs recording the surrounding area will also be recorded.

Table 6.2: Habitat Management & Monitoring Action

HMP Action Ref. No.	Management Measure	Target	Method	Measurement	Timing	Entity Responsible
1.	**Grazing Control**	Promote grazing regimes as outlined in Section 5	Implementation of livestock numbers specified in Section 5	Monitor grazing and liaise with landowner to check that livestock numbers and grazing regime are adhered to. The success of the grazing regime in terms of contributing to heathland and heathland restoration will be monitored using permanent fixed quadrats. A photographic log of all quadrats and areas subject to grazing control will be maintained.	Throughout lifetime of the HMP. Monitor during Years 1, 2, 3, 5, 7, 10, 15, 20, 25, 30, 35 & 40 of the operation phase	Operator
2.	**Install stock proof fencing**	Install stock proof fencing around the boundary of the HMP Management Lands. Fencing to be installed by Contractor during the construction phase.	Post and rail fencing	Monitoring fencing during annual monitoring.	Monitor during Years 1, 2, 3, 5, 7, 10, 15, 20, 25, 30, 35 & 40 of the operation phase.	The Construction Contractor /Operator
4.	**Control competitive non-indicator heathland species**	Non-indicator heath species should be kept to a minimum of <10% of the vegetation in the HMP area priority habitats.	Removal of Competitive Species. Remove spreading conifer trees.	Quadrat monitoring and photographic log will be undertaken to measure the extent of non-indicator species.	Control on an annual basis. Monitor during Years 1, 2, 3, 5, 7, 10, 15, 20, 25, 30, 35 & 40 of the operation phase.	The Construction Contractor /Operator
5.	**Sensitive removal of heathland**	Sensitively remove heathland vegetation as turves under the	Remove heath vegetation as turves excavated to a depth of at least 30 cm, where soil	Construction Contractor's ECoW monitoring of heathland turving and	Construction phase – vegetation clearance.	Construction Contractor

HMP Action Ref. No.	Management Measure	Target	Method	Measurement	Timing	Entity Responsible
	vegetation from areas of the construction footprint as turves	footprint construction site, maintain turves in good condition so that they can be reinstated in temporary construction areas.	depths are to this level or below. Where shallower remove to base of soil. This layer will be stored as turves and kept viable by irrigation if necessary because soil and especially and peat component is prone to shrinkage and drying.	condition during the construction phase.		
6.	**Re-instate turves in Re-instatement Areas**	Re-instate turves and restore heathland vegetation in the reinstatement areas.	Re-instate turves following the management techniques outlined in Section 5.1.5	The success of turve re-instatement and heathland restoration will be monitored using permanent fixed quadrats. A photographic log of all quadrats and areas subject to turve reinstatement will be maintained.	Re-instate turves during the Construction stage. Monitor during Years 1, 2, 3, 5, 7, 10, 15, 20, 25, 30, 35 & 40 of the operation phase.	Construction Contractor
7.	**Restrict drainage**	No drainage of lands within the HMP Management Lands throughout the lifetime of the HMP.	Restrict drainage activity	Monitoring of site for any signs of turbary activity. Liaise with landowner to ensure no drainage is undertaken throughout the lifetime of the plan.	Throughout the lifetime of the HMP.	Operator
8.	**Prevent certain land use practices**	Prevent certain land use practices to ensure favourable conservation status of heathland habitats.	Prevent the following activities throughout the lifetime of the HMP: • The reclamation, fertilisation or drainage of the HMP area will be restricted. • The application of slurry, lime, herbicides, pesticides, insecticides,	Quadrat monitoring Photographic log	Implement throughout lifetime, and monitor/report during Years 1, 2, 3, 5, 7, 10, 15, 20, 25, 30, 35 & 40.	Operator

HMP Action Ref. No.	Management Measure	Target	Method	Measurement	Timing	Entity Responsible
			fungicides will be restricted. • Scrub will be prevented from establishing on heathland and heathland habitats through ongoing removal.			
9.	**Red Grouse Habitat Management**	Provide heath sward height mosaic for red grouse	Cutting of discrete areas of heather strips within the HMP Management Lands using hand-held equipment such as strimmers.	Mapping of area of cut heather. Area to be mapped as m^2 units. Annual monitoring of HMP Management Lands for the presence of red grouse. Monitoring to be completed during the early spring late February and 1st half of March to identify the presence of males and territories.	Annually during the operation phase	Operator
10.	**Shooting Prohibition**	No shooting within HMP Management Lands and the wind farm site throughout the lifetime of the HMP and wind farm.	Prohibit shooting	Monitoring of site for any signs of unauthorised shooting. Liaise with landowner to ensure no shooting is undertaken throughout the lifetime of the plan.	Throughout the lifetime of the HMP.	Operator

6.3 References

NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.

Perrin, P.M., Barron, S.J., Roche, J.R. & O'Hanrahan, B. (2014). Guidelines for a national survey and conservation assessment of upland vegetation and habitats in Ireland. Version 2.0. Irish Wildlife Manuals, No. 79. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.