

**PROPOSED WIND FARM  
AT FIRLOUGH, CO. MAYO**

**BIODIVERSITY ENHANCEMENT  
AND MANAGEMENT PLAN**

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*Prepared for*

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*by*

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## **1.0 INTRODUCTION**

### **1.1 Background**

This Biodiversity Enhancement and Management Plan (BEMP) has been prepared in support of the Environmental Impact Assessment Report (EIAR) produced for the proposed Firlough Wind Farm, and Hydrogen Plant in Co. Mayo and Co. Sligo. Full details of the Proposed Development are given in **Chapter 2** of the EIAR.

As part of the Proposed Development, an area of cutover bog, measuring approximately 15.23 ha, will be built upon. As the cutover bog is considered of Local Importance (higher value), compensation is being provided to off-set the habitat loss through the implementation of the Biodiversity Enhancement and Management Plan (BEMP), as described in this report. In particular, the BEMP is focused on the rehabilitation of an area of blanket bog habitat (10.6 ha), which has been partly cutover in the past. Following the implementation of the measures outlined in this report, there will be a marked improvement in the quality/condition of the peatland habitat on the site.

The bog rehabilitation programme described in this report will be implemented in accordance with published guidance and best practice, as follows:

- SNH (now NatureScot) “Planning for development: What to consider and include in Habitat Management Plan – Guidance” (Version 2, March 2016).
- Coillte (2008) *Restoring Active Blanket bog in Ireland* (LIFE Project Number LIFE02 NAT/IRL/8490). End of Project Report.
- Mackin *et al.* (2017) *Best practice in raised bog restoration in Ireland*. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

A walk-over survey of the site was undertaken by Dr John Conaghan on 3<sup>rd</sup> May 2023. John is an experienced peatland ecologist and has worked with Coillte on their LIFE funded bog habitat restoration programme.

### **1.2 Outline Description of Proposed Wind Farm Site**

The Wind Farm Site is situated approximately 4 km northeast of Bunnyconnellan village. It comprises an area of lowland blanket bog which has been extensively cutover in the past, with cutting still occurring to the present day. Peat depths on site are generally shallow (0.5-2.0 m) to moderately deep (2.0-3.5 m), with smaller areas of uncut bog where the peat depth is greater than 3.5 m.

Drainage of the site is to the Glenree and Owencam rivers which flow to the west and join to the Brusna River, which in turn merges with the Moy River, just north of Ballina. In the north-west of the Wind Farm Site, the land drains to the Gowlaun River, which eventually merges with the Easky River which enters the Atlantic Ocean at Easky village.

Ecologically, Wind Farm Site can be described as being dominated by cutover bog (PB4), with smaller areas of relatively intact, uncut, lowland blanket bog (PB3) scattered throughout. Small areas of conifer plantation (WD4) and wet grassland (GS4) habitat also occur along the site margins.

### **1.3 Objectives of the BEMP**

#### **Objectives - primary**

To preserve and rehabilitate an area of lowland blanket bog which has been partly cutover and drained in the past (hereinafter known as the 'peatland restoration area') to compensate for the loss of cutover bog as a result of the proposed wind farm development.

#### **Objectives - secondary**

To provide enhanced habitat for peatland associated species such as red grouse, meadow pipit (both Red-listed), skylark, the common frog and the common lizard, which may be affected by the loss of some cutover bog habitat as a result of the proposed project.

## **2.0 PLAN DETAILS**

### **2.1 Plan area location**

The plan restoration area adjoins to the south-west of the Wind Farm Site (see Figure 1). Recently felled and replanted conifer plantation lies to the west of the restoration area while much of the remainder of the area is adjoined by cutover bog. The plot measures approximately 10.6 ha in area.

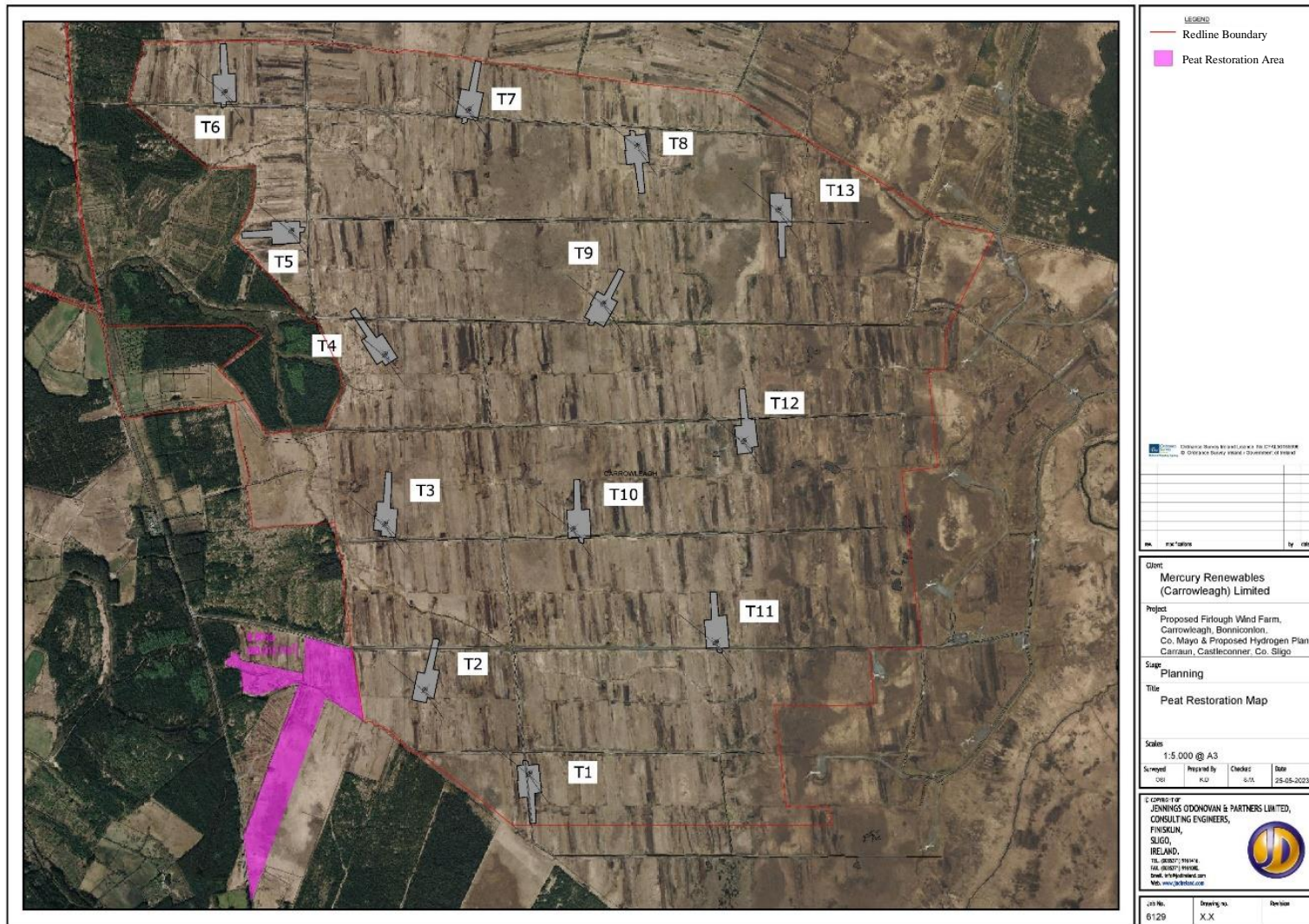
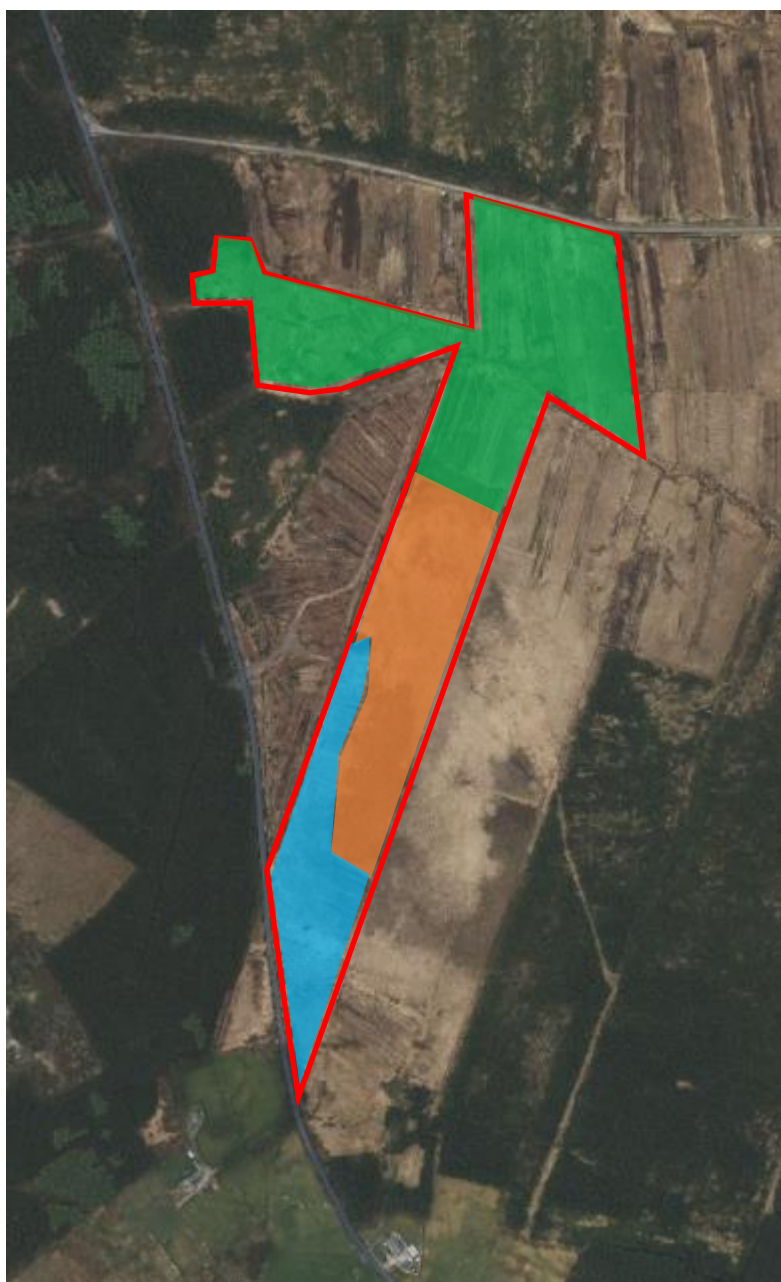





Figure 1. Location of area for peatland restoration at Firlough Wind Farm.



-  = Cutover bog (PB4) with recent cutting
-  = Old cutover bog surface (PB4)
-  = Uncut lowland blanket bog (PB3)

**Figure 2.** Aerial image showing the distribution of habitats within the restoration area.





**Plate 1.** View of an active bog drain within the north of the restoration area.





**Plate 2.** Old turf spread-field area, with a high cover of bare peat.

## 2.2 Description of the peatland restoration area

The restoration area can be divided into 3 main sections (Figure 2). The northern section comprises an area of extensively cutover bog, dominated by *Molinia caerulea* and *Calluna vulgaris*, which has been cut for peat until within the past 5 years. This area contains a number of prominent drains (see **Plate 1**) and turf spread-field areas dominated by *Eriophorum angustifolium* and *Carex* spp. with a high cover of bare peat (see **Plate 2**). A number of deeply cutover areas also occur and these have potential for rewetting via the blocking of outlet drains (**Plate 3**). Although past peat-cutting has been locally intensive, much of the area still retains areas of well-vegetated uncut peat with a depth of between 1 and 2 metres.

The middle section of the restoration area comprises largely uncut blanket bog dominated by *Molinia caerulea*, *Eriophorum* sp. and *Calluna vulgaris*, with a Sphagnum cover in the range of 20 to 50% (see **Plate 4**). Although the bog in this area has not been cut in the past it is subject to drying out, especially along its margins and the bog habitat would benefit from any drain-blocking/rewetting in the adjoining areas of cutover bog.

The southern section of the area comprise old cutover bog surfaces dominated by *Molinia* with a relatively low Sphagnum cover. There is no evidence of recent peat cutting in this area.



On the day of survey small numbers of sheep were noted grazing in the adjacent recently felled forest areas however there was no indication of grazing damage by sheep in the bog areas. Self-sown conifer saplings/low trees occur throughout the site however they are very rare.

The present ecological value of the plot is relatively low however there is good potential to prevent further peat cutting and to rewet the existing areas of cutover bog.



**Plate 3.** Deep cutover area in the north of the site with good potential for re-wetting and recovery of vegetation.



**Plate 4.** Uncut blanket bog in the centre of the site dominated by *Calluna* and *Molinia*.

## **2.3 Management Prescriptions**

The following management prescriptions outline the work that will be required for implementation of the Plan and will be in effect for the lifetime of the Project.

It is noted that the following activities will be prohibited within the area of the Plan:

- Peat cutting
- Insertion of new drains
- Intensive grazing of livestock
- The planting of forestry

### **2.3.1 Prescription no. 1: Marking the plot**

While there is no need to fence the plot, there is a need to mark out the extremities so that third parties are aware of the area within the control of the Firlough Wind Farm Project. This would be done by insertion of wooden posts at intervals along the perimeter of the plot and particularly at the corners. The posts will be hammered in by operatives without the need for bringing machinery onto the peat surface.



### **2.3.2 Prescription no. 2: Blocking of drains**

A walk-over survey of the site (April 2023) has revealed that there are a number of significant drains to be blocked in the northern sector of the site (see Plate 1). These drains will be blocked by excavator using fresh peat from adjacent (already disturbed) areas. The distance between peat dams will be determined by a survey of surface levels prior to drain blocking. In the case of smaller drains, plastic dams, inserted by hand could be used (see example in **Plate 5**).

The ultimate purpose of blocking drains is to raise water levels in the peat to encourage the growth of peat-forming vegetation and especially the growth of Sphagnum mosses. In previously cutover bog areas, there is the possibility of re-wetting old cutover peat surfaces via the strategic blocking of outlet drains.

In cutover areas where there are no obvious drains, *e.g.*, the southern section of the site, it will be possible to install low peat bunds using an excavator. These peat bunds are essentially low ridges of excavated peat which slows the flow of surface water. This in turn will increase surface wetness in cutover areas thus facilitating the growth of Sphagnum on the cutover surface.

Procedures for drain blocking and bunding in bogs are described in detail in Mackin *et al.* (2017).



**Plate 5.** An example of a recycled plastic dam used to block functioning drains on a raised bog site.

## **2.4 Monitoring**

In order to confirm that the objectives of the bog restoration and enhancement plan are being achieved, the area of restoration will be monitored during the lifetime of the wind project. SNH (2016) note that a Habitat Management Plan should be a live document, which may be altered following monitoring results, unexpected events or evolving guidance. Any alterations would only occur following approval by the relevant parties.

#### **2.4.1 Monitoring for bog vegetation**

Just before drain blocking takes place a series of permanent quadrats will be set up for the purpose of monitoring of vegetation change over time. The location of these quadrats will be marked using wooden pegs and the grid reference will be recorded using GPS. It is expected that up to ten quadrats will be described and they will be large (at least 5m x 5m) to take into account the scale of the plan area. The occurrence and cover of vascular plant and moss species will be recorded in these quadrats along with a number of other important parameters such as the height of vegetation, cover of bare peat, peat depth, flowering of plant species etc. This survey will take place in early July of each monitoring year. Photographs of the quadrats will also be taken on deployment and subsequently during the following years of monitoring.

During the site visits for vegetation monitoring, a walk-over survey will take place in order to check for the presence of occasional self-seeded conifers that may become established. Seedlings up to approximately 20 cm in height can be easily plucked out by hand, while larger saplings may need to be removed by loppers or hand-saw at some stage later in the year.

The walk-over survey will also observe if any further drains require blocking or if any of the newly installed dams require maintenance.

Monitoring will take place during Operational Years 1, 2, 3 & 5 of the Plan implementation, with Year 1 being the base year at the time the works are carried out. After Year 5, a review of the progress will be conducted in light of the Plan objectives, and a programme will be developed for the next 5-Year period of the Plan (and so on for the lifetime of the Project).

#### **2.4.2 Monitoring for birds**

As it is expected that bird species that occur in the adjoining area of cutover bog will benefit from the restored bog, breeding bird species will be monitored.

The post-construction bird monitoring for the Wind Farm Site, as described in the Ornithology chapter of the EIAR (see Chapter 7) will include a transect through the bog restoration area. As for the main site, the monitoring will be undertaken in Years 1, 2, 3, 5, 10, and 15 of the lifetime of the wind farm.



Surveys will be conducted in accordance with SNH guidance (SNH, 2017) and any relevant updates, by an appropriately experienced ornithologist.

## **2.5 Time Period for Plan Implementation**

**Year 1** of the Plan will include all physical measures required, namely the marking of the plot and the blocking of drains.

Year 1 will coincide with the completion of wind farm construction works.

### **Year 2 and subsequent years**

Throughout the lifetime of the Plan there is a need to check the restoration area in order to check if dams are functioning properly and to check for the establishment of any self-seeded conifer seedlings. This will be done by a walk-over survey during the monitoring years for vegetation. Any conifers recorded will require removal using a loppers or hand-saw while small self-seeded seedlings (up to c. 20) can be plucked out by hand.

## **3.0 OVERVIEW**

The BEMP for the Firlough Wind Farm project will preserve and restore an area of largely cutover lowland blanket bog that has been damaged by peat cutting both recently and in the past. This will provide compensation for the loss of cutover bog as a result of wind farm construction.

It is anticipated that various important species of flora and fauna will utilise the area as the habitat improves in quality over time.

The objectives for the Plan are achievable, as similar bog restoration projects have been carried out successfully at various properties in Ireland (Coillte 2008, Mackin *et al.* 2017).

The Plan will be underwritten by a detailed monitoring programme, which will allow for modifications to ensure that the objectives are being achieved throughout the lifetime of the proposed wind farm. A reporting schedule will be agreed with the Planning Authority as evidence of compliance.

#### **4.0 REFERENCES**

Coillte (2008) *Restoring Blanket bog in Ireland* (LIFE Project Number LIFE02 NAT/IRL/8490). End of Project Report.

Fossitt, J. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

Mackin, F., Barr, A., Rath, P., Eakin, M., Ryan, J., Jeffrey, R. & Fernandez Valverde, F. (2017) *Best practice in raised bog restoration in Ireland*. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

SNH (now NatureScot) "Planning for development: What to consider and include in Habitat Management Plan – Guidance" (Version 2, March 2016).

Scottish Natural Heritage (2017). Recommended bird survey methods to inform impact assessment of onshore wind farms.