

Environmental Impact Assessment Report

Cummeennabuddoge Wind Farm

Technical Appendix 8-4: Habitat Management Plan

Cummeennabuddoge Wind (DAC)

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1 Introduction

This Habitat Management Plan (HMP) is provided in support of a planning application to construct and operate 17 turbines with a maximum tip height of 200 metres (m) and a maximum export capacity of 122.4 Mega Watts (MW), and associated infrastructure including hardstandings, cabling and access roads (the 'Proposed Development' hereon referred to as the 'Site').

This HMP will be finalised following the completion of the planning process in collaboration with An Bord Pleanála and at this stage, should be regarded as a first iteration. It should be read in conjunction with the Construction Environment Management Plan (CEMP), Peat and Spoil Management Plan (PSMP) and Surface Water Management Plan (SWMP). The HMP considers the replacement and enhancement of Annex 1 HH3 wet heath and PB2 upland blanket bog, habitat enhancement for Kerry slug *Geomalacus maculosus*, marsh fritillary *Euphydryas aurinia* and of riparian habitat for fish and freshwater pearl mussel (FPM) *Margaritifera margaritifera*. A programme of toolbox talks to inform contractors as to their obligations for protecting common frog *Rana temporaria* is also included.

Habitat Management Areas (HMAs) are shown on Figure 8-8.

The Method Statement for Kerry slug should be read in conjunction with this document (TA 8-5).

2 Aims and Objectives

This document details measures/prescriptions to be implemented in relation to habitat management on the Proposed Development.

The aims of the HMP are to:

- Enhance an area of HH3 wet heath which is in poor condition.
- Enhance an area of HH3 wet heath/PB2 upland blanket bog habitat to blanket bog.
- Enhance habitat for local Kerry slug and marsh fritillary populations.
- Enhance riparian habitat for the benefit of fish and FPM.
- Ensure the protection of common frog from mortality/injury because of works.
- Provide an outline monitoring system to oversee the installation and efficacy of the proposed measures.

The primary agent responsible for implementing these measures will be the Applicant's Ecological Clerk of Works (ECoW).

2.1 Scope of the Habitat Management Plan

This is a framework document intended to be a live document, modified, and refined throughout the monitoring period of the HMP and reported through the Applicant's ECoW to An Bord Pleanála and stakeholders. The proposed methodologies will therefore be refined considering emerging monitoring results. This will allow the methodologies in use to be adapted to take into account the progress of the development of the habitats and ensure that development of the habitat is not hindered by not adjusting the management should that be required.

This HMP considers the specific features of the Proposed Development and the local area in making recommendations based on best information currently available. If aspects relating to the Proposed Development Footprint are altered, or new ecological information emerges then the HMP will be required to be adapted accordingly. In this way the HMP, through monitoring, will take account of the successes and failures of the management measures; modifications to the management regime can then be proposed as necessary.

The Proposed Development design has gone through various iterations to avoid sensitive habitats and watercourses and to facilitate the installation of a 60m buffer from watercourses, from the Scoping Layout through to Design Freeze. For detailed information on this process see Volume 2, Chapter 3: Design Evolution and Consideration of Alternatives.

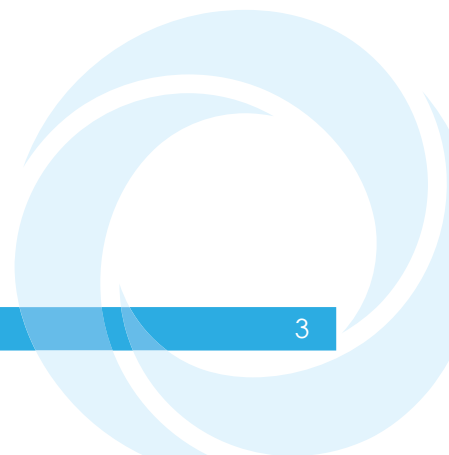
2.2 Habitat Management Areas

Habitat management will occur within units known as Habitat Management Areas (HMA); differentiated by receptors as outlined in Section 3. One function of the overall HMA categorisation is that protocols can be developed that apply to all HMAs (in order to simplify those protocols). For example, it will be communicated to personnel that *all* HMAs are out of bounds during construction- if the relevant environmental protection document has not been read, understood, and signed – and branded signage will be developed to denote HMAs at a generic level, with additional branding to define specific sensitivities.

2.3 Objectives overview

The objectives which will help achieve the long-term aims are as follows:

- Objective 1: To install cut-off drains to raise the water table within wet heath/grassland mosaics to encourage the dominance of wet heath and where suitable, blanket bog.
- Objective 2: To remove purple moor-grass *Molinia caerulea* present on habitats containing wet heath and blanket bog.
- Objective 3: Implement a rhododendron *Rhododendron ponticum* eradication programme for the benefit of Kerry slug.
- Objective 4: Remove obstacles to fish passage and increase bankside vegetation cover in consultation with Inland Fisheries Ireland (IFI).
- Objective 5: Communicate via on-site toolbox talks protocols in relation to common frog protection including the timing of vegetation clearance.
- Objective 6: Enhance grassland to encourage colonisation and recruitment by marsh fritillary.
- Objective 7: Implement a monitoring programme in relation to the effectiveness of Objectives 1-6 running to at least the 5th year of operation.



3 Objectives

The areas proposed for habitat enhancement are shown in outline on Figure 8-8. Appendix A. Detailed prescriptions will be developed subject to agreement with An Bord Pleanála and concerned stakeholders and will be included in a revised HMP produced post- Application consent. HMAs relate to objectives 1, 3, 4 and 6.

3.1 Objective 1

To install cut-off drains/block ditches to raise the water table within wet heath/grassland mosaics to encourage the dominance of wet heath.

3.1.1 Rationale

Maintaining existing hydrological levels in areas of functional wet heath and blanket bog habitat and raising levels where they are in poor condition, is key to success and proliferation for this will allow water to stay in the system for longer and re-establish the natural level of the water table (Hampton, 2008). Management from run-off from proposed works is an important consideration when working within, or adjacent to targeted habitats and when choosing sites for restoration. Retaining water within existing drains would have the effect of re-wetting the vegetation by raising the water table. Indicatively placed HMAs are shown in Figure 8-8 in areas of denuded wet heath and blanket bog or where there is potential for these to dominate in currently existing habitats.

In relation to wet heath HMAs will be located within degraded examples of each type, as follows:

- HH3/GS4 Wet heath/Wet grassland.
- HH3/GS3/GS4 Wet heath/Dry-humid acid grassland/Wet grassland habitats.

The Proposed Development will result in the loss of 0.9ha of wet heath (HH3) and 1.13ha of HH3/GS4 and HH3/GS3/GS4 (latter two habitats shown as combined loss). These latter two habitats are considered to be wet heath in poor condition.

Compensation will occur within areas of Bat Exclusion Zones¹ around T11 and T17 where no hard construction is intended (vegetation cleared to facilitate construction and, assuming trees are present, the area required to be removed from around the turbine). These locations are chosen because T11 has HH3/GS4 within it, and because T17 is in the vicinity of T11 – which will facilitate practicalities in respect of the restoration. No other BEZ was selected because no other BEZ has existing HH3 present. The target is 4.76ha total area for HH3 restoration.

In relation to blanket bog HMAs will be located within:

- HH3/PB2 Wet heath/Upland Blanket Bog.
- PB4 Cutover Bog.

Compensation will occur within BEZs around T14 because this area contains 1.41ha of PB4 cutover bog (considered lost) in combination with HH3/PB2, another bog habitat

¹ Areas of soft fell

(0.15ha) To compensate for the total loss of 1.56ha of habitat containing bog, 2.38ha of blanket bog (PB2) will be restored at T14 and a further 2.39ha at T9 (Figure 8.8).

As a result:

- **2.03ha of wet heath will be lost, the majority of which is degraded. It is proposed this will be replaced with 4.76ha. wet heath; and**
- **1.56ha of degraded bog will be lost. It is proposed this will be replaced with 4.69ha. of upland blanket bog.**

Habitats in the bullets above are either degraded examples of the desired habitats and/or have the potential to become wet heath or blanket bog via successional processes. Areas of degraded habitats of this type are present throughout the Site due to the history of felling activity chiefly because of drying out/drainage effects.

Improvements to water quality are expected as a result of blocking of artificial drainage ditches, as it is known to be highly successful in reducing both the Dissolved Organic Carbon (DOC), and level of discolouration in soil waters.

Ditch blocking will be implemented where appropriate to raise and stabilise the water table year-round, thus reducing the amount of artificial drainage and allowing peat restoration to occur.

3.1.2 Methodology

A survey will be undertaken by the ECoW and Applicant to identify areas suitable for ditch blocking/cut-off drain installation, focusing on T11 and T17. These locations are in the area marked 'HMA1' (Figure 8-8).

In relation to blanket bog, areas showing signs of degradation from either grazing and/or drainage will be prioritised, and hags or gullies will be re-profiled to a shallow slope (33-45°) and covered with peat vegetation which has roots intact. No exposed peat will remain. The focus for this activity will be T14 where over a hectare of degraded PB4 cutover bog is present.

Once locations have been identified they will be isolated from run-off and nutrient enrichment sources by managing activities which occur there (e.g., felling), and when they occur (e.g. felling during rain may result in more run-off). HMAs will be excluded from the works zone with barriers (e.g., Heras) and silt fencing.

The recommended spacing/frequency of blocking is specific to each ditch. Dam spacing generally ranges from 0m (where the ditch is completely in filled) to 44m. This is dependent upon slope, angle, and water volume as stream power, and consequently erosion, is dependent upon these factors.

Once the proposed ditches for blocking have been agreed as part of the HMP, suitably trained sub-contractors will be responsible for implementing works under the supervision of the ECoW. Works will then be completed following current industry good practice guidance.

The success of ditch blocking is based on site conditions, levels of existing degradation as well as ensuring that appropriate techniques are adopted at individual sites, whilst within the context of an appropriate monitoring programme (see Objective 7).

Care will be required to ensure that measures do not cause siltation risk to watercourses that are located within much of the mosaic habitats concerned, and the ECoW will consider this in respect of any enhancements.

During restoration operating machinery and materials will be stored within the footprint of permanent construction features and appropriate training of the site staff and fencing / signage to ensure that vehicles and their operators do not inadvertently stray onto adjacent habitat areas.

3.2 Objective 2

To remove purple moor-grass present on habitats containing HH3 wet heath and PB2 upland blanket bog, focusing on HMA1 sites as shown in Figure 8.8.

3.2.1 Rationale

A survey will be undertaken by the ECoW to identify purple moor-grass where present within mosaics that contain wet heath and blanket bog. As these areas are difficult to confirm in the ever-changing forestry environment, plus the rapid propensity for colonisation of this species, they are not included as HMA areas on Figure 8-8. Once the survey has occurred it is intended new HMAs will be added to a future iteration of the HMP.

Purple moor-grass is a vigorous grass that can outcompete other vegetation. Dominance is indicative of a formerly wetter habitat, such as wet heath, impoverished through drying-out, over-grazing or burning or a combination thereof. In trying to restore the desired habitats it is important to remove as much of this species as possible to allow other species more typical of the desired habitats to flourish.

3.2.2 Methodology

Purple moor-grass sods will be identified, marked out, cut, and then removed. They will be removed and disposed of outwith other habitats so as not to cause to spread to unsuitable locations. Cutting and sod removal will only occur where purple moor-grass dominates to avoid the removal of areas of desirable species. Whilst some bare earth is helpful to wet heath recolonisation, care will be taken to ensure that large areas of bare earth do not become sinks for dirty water. Grips may need to be installed in such instances to prevent this scenario.

These works will be carried out under strict supervision and guidance of the ECoW.

Care will be required to ensure that measures do not cause siltation risk to watercourses located within the mosaic habitats concerned, and the ECoW will consider this in respect of any enhancements.

3.3 Objective 3

Improve habitat for Kerry slug.

3.3.1 Rationale

This will comprise a Rhododendron eradication programme and habitat enhancements.

According to the Kerry Slug Threat Response Plan (DoEHLG, 2010), as cited in McDonnell and Gormally (2011), invasion of woodland by rhododendron is one of the main threats to this species. Rhododendron denudes the herb layer by the poisonous leaves, that are unpalatable to Kerry Slug, and causes excessive shading thereby limiting the quantity of lichen and bryophyte food resources (DoEHLG, 2010).

Whilst small amounts of Rhododendron were found during surveys (Appendix B, Figure 8.3: Invasive Species) these were on the western access track which offers a risk of spread from increased construction traffic.

Enhancements will comprise retention of felled stumps and surface boulders within BEZs. Roadside underpasses will be installed to facilitate passage of slugs beneath access tracks.

3.3.2 Methodology

The first action will be to update the invasive species survey undertaken for the EIAR to confirm the extent of rhododendron and if there is any change (TA 8.1, Figure 8-3). Whilst a survey for rhododendron of the Proposed Development Site will be undertaken initial efforts will focus where rhododendron is confirmed (Figure 8-8, HMA3 sites). The next action will be to establish if any Kerry Slug is present within these stands for whilst considered unfavourable (Barron, 1998), they may be present such as within the Glengarriff woodlands (Co.Cork) as discussed in McDonnell and Gormally (2011). Should individuals be present this objective will be abandoned.

If Kerry slug is absent the following measures will be implemented in HMA3 sites shown on Figure 8.8:

- Plants to be cut and stumps removed.
- If stumps cannot be removed stumps to be spot sprayed with glyphosate.
- Brash piles to be erected around cleared areas to prevent mammal (primarily deer) ingress which can rhododendron cause to spread.
- HMA3s to be monitored by the ECoW and if re-growth noted further measures including removal and spraying considered.

Mature areas of closed canopy forestry are proposed to be felled within the BEZs. These areas will remain free of forestry and not subsequently developed. For BEZs where no habitat restoration is intended (i.e. at turbines 1-8, 10, 12, 12, 15 and 16), these will be enhanced for Kerry slug. Tree stumps will be left in-situ in these areas where possible and further enhanced by the addition of retained surface boulders collected from the Site during clearance works. Should there be insufficient surface boulders retained to cover these areas, then additional subsurface sandstone rock sourced from the on Site borrow pits may be used. Previous research has shown that Kerry slug will recolonise boulder habitat after clear-felling (McDonnell & Gormally, 2011; Reich et al., 2012).

3.4 Objective 4

Remove obstacles to fish passage and increase bankside vegetation cover.

TA 8.4: Aquatic Ecology and Fish Surveys, and Figure 8.6 should be viewed in conjunction with Figure 8.8 (to view HMA4 areas).

3.4.1 Rationale

At the time of the surveys, clear-felling of Sitka spruce *Picea sitchensis* was ongoing in the study area. Soil and nutrient loss to headwater streams and other vectors of overland water (rills, drains, roadside channels) is inevitable during clear-felling in upland areas, when trees are planted to the verge of streams, as was seen to be the case. Clear-felling along riparian zones which have an impoverished ground flora due to excessive shading results in poor / no buffering, easily damaged watercourses and extensive soil loss (eroded soils) following heavy rainfall. Clear-felling of commercial forestry in the study area is considered a potential water quality pressure in terms of peat loss due to denuded soils and nutrient loss due to decomposition of brash. The large areas of Sitka spruce forestry that were being felled and other areas had been felled in the months prior to survey² are likely an ongoing source of peat silt and phosphate until such areas have revegetated and stabilised. Indeed, substrate conditions at Site 1, located downslope of an area being felled and the time of the current surveys, was found to be impacted by peat silt and there was evidence of enrichment in the form of filamentous algae (Figure 8.6).

Some obvious barriers to upstream moving fauna were recorded between site 7 and site 8, a track has been constructed over the bed of the stream and there is a drop of ca. 1.2 m immediately below the track. There is a perched pipe at Site 6 (Figure 8.6).

Whilst there will be no in-stream construction working and a 60m watercourse buffer will be in place, given the increased activity, in-combination with existing forestry operations, there is potential for run-off to gather within watercourses. In addition to exclusion fencing (e.g., Heras) limiting access, silt-fencing will be installed adjacent all watercourses within the Proposed Development (as defined as the red-line boundary in Figure 8.8).

3.4.2 Methodology

Overall, mitigation measures to protect water quality in the EIAR should prevent siltation however enhancement measures, as detailed here, will focus on bankside vegetation management and obstacle removal in locations confined to the Site boundary. As such, aquatic survey locations 3, 7, 8 and 9 - where these issues were identified (TA 8.4, Figure 8.6) - comprise HMA4 sites.

A survey, carried out by the ECoW/Suitably Qualified Ecologist (SQE), will take place to identify suitable sites for riparian woodland planting, focusing on HMA4 areas although these may be subject to revision following ground-truthing. No loss of commercial forestry is proposed as part of this process.

² Aquatic surveys were completed in 2021.

Willow species, of local provenance, will be planted on eroded bankside sites identified by the ECoW. Conversely, where mature trees dominate, and over-shading is an issue, coppicing and /or selective thinning will be undertaken. The guiding principle is to enhance in the most appropriate way for a given bankside location. As such, this will vary between the need to plant trees (stabilise soil, prevent run-off), remove trees (reduce/displace shading) and to do-nothing. Throughout this process consideration will be given to existing habitat use by other species which may be using it, such as nesting waterfowl.

It is proposed to remove the existing impassable features at sites 7 and 8 and to monitor these locations to confirm whether fish are subsequently able to pass (Figure 8.6).

Following the ECoW survey, IFI will be consulted on measures proposed at identified locations.

3.5 Objective 5

Communicate via on-site toolbox talks protocols in relation to common frog protection including timing of vegetation clearance.

3.5.1 Rationale

Common frog was identified throughout the Proposed Development during surveys. Their ubiquity and propensity to occur in both terrestrial and aquatic habitats mean they are susceptible to mortality/injury from works. The species is protected under the Wildlife Act and Wildlife (Amendment Act (2000)) and is a species identified in the County Cork BAP 2009-14.

3.5.2 Methodology

The ECoW will provide regular toolbox talks on the risks posed to common frog. These talks will be repeated regularly to instil the importance of the need to protect common frog and ensure that new personnel are aware of their obligations.

It is recommended that terrestrial vegetation is removed from the autumn onwards as by this time most juveniles will have developed into adults which will enable them to move out of harm's way. Most adult frogs spend the autumn/winter within ponds and as such they will be less widely dispersed across the site. Fence installation and vegetation clearance in areas where common frog is likely to be present will be overseen by the ECoW. The ECoW will be the only person to move animals to identified areas outwith the works zone.

Given the ubiquity of this species found during surveys fenced 'receptor areas' will be identified in order to translocate individuals found during pre-construction checks. Fencing will be installed in September/October prior to clearance.

3.6 Objective 6

Enhance grassland to encourage colonisation and/or recruitment by marsh fritillary.

3.6.1 Rationale

Marsh fritillary is a qualifying interest species of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment Special Area of Conservation which is immediately to the north of the Site. Whilst no marsh fritillary was found during surveys and available habitat is limited, there is potential to enhance available grassland to encourage this species. The aim is to facilitate recruitment in relation to restoring both favourable conservation status of the species within the SAC, but also beyond the borders of the designated site. Provisional HMA areas (HMA6 sites) are shown on Figure 8.8, but these will be surveyed by the ECoW to confirm suitability.

3.6.2 Methodology

The first action is for the ECoW to survey grassland areas for the presence of devil's bit scabious (*Succisa pratensis*), which is the larval food-plant, or marsh fritillary itself. Checks for former will be taken between August – October and for the larval food webs of marsh fritillary between February – March or August – October. Subject to the identified HMAs requiring improvement (no marsh fritillary or devil's bit scabious) sites will be fenced to stop deer/livestock entering. Agreement will be sought with the Applicant and ground operatives regarding the installation of fencing to ensure this will not impede site operations/works.

Once the above is in place the following actions will be undertaken:

- If no marsh fritillary or devil's bit scabious is present plug plants, of local provenance, will be planted within HMAs.
- Scrub will be removed between October – February.
- Mowing of a third of an HMA6 site will occur within a given year between November and February. Arisings will be removed.
- Dense stands of rushes can be thinned between November and February where these dominate to hinder a mosaic of grasses and rushes.

The aim is to create/enhance breeding marsh fritillary patches within the landscape and a mosaic of grasses and rushes of mixed height (between 12-25cm) is desirable. Whilst excessive scrub is not helpful a small amount per HMA will provide some shelter and will be retained. Whilst the site synopsis for the SAC (NPWS, 2022) advises this should be no more than 10% for scrub more than 1m, given the limited areas available no more than 10% of scrub of any height, is recommended.

The above is informed and adapted from NPWS (2022), Smith *et al.* (n.d) and DoAERA (2017).

3.7 Objective 7

Implement a monitoring programme in relation to the effectiveness of Objectives 1-6 running to at least the 5th year of operation.

3.7.1 Rationale

The HMP will function for the lifespan of the Proposed Development which is 35 years. Appointment of ECoW will ensure the relevant requirements of the HMP are implemented during the construction phase and the Applicant will ensure that an SQE/ECoW oversees implementation of prescriptions during the operational and decommissioning periods. It is suggested that the schedule for carrying out the above objectives will be developed.

Vegetation monitoring will be undertaken in areas where enhancement/protection measures have occurred, with permanent quadrats established in each HMA to monitor how the site is responding to habitat management.

The ECoW will monitor the condition of sensitive habitats, including areas of restored peat and watercourses. Quadrats will be established in year 1 following commissioning, with surveys carried out in year 3 and 5. Vegetation surveys would be reviewed by the National Parks and Wildlife Service in year 5 but until that point the working basis beyond that point is for surveys in years 5, 10, 25 and 35. This may be amended as a result of the review in year 5. Results of monitoring would be reported to the stakeholders on an annual basis in the years where monitoring occurs.

Monitoring the progress of the HMP prescriptions will be essential to allow an assessment of the success of the HMP in meeting the stated aims and objectives.

An annual report will be produced by an SQE for each of years 1-5 with results of monitoring from objectives 1-6.

3.7.2 Methodology

Objective 1

The following will be used as indicators of restoration success on areas of upland wet heath, as per DEFRA 2005:

- No burning of the area of recovering dwarf shrub heath.
- Between February and April no more than 33% of Heather shoots should show evidence of grazing.

By year 5:

- Less than 10% of bog-mosses (*Sphagnum*) will be damaged or dead.
- Flowering Heather plants will be frequent between July and September.
- Dwarf shrubs will be at least frequent.
- The cover of scattered scrub will be less than 20%.
- The cover of Bracken will be less than 10%.
- The cover of invasive weeds such as *Rhododendron*, *Creeping* and *Spear Thistle* (*Cirsium arvense* and *C. vulgare*), docks (*Rumex* spp.), will be less than 1%.
- The area of disturbed bare ground will be less than 10%.

As wet heath can take 30 years³ to reach good target condition (Natural England, 2022) the programme will be reviewed and developed at year 5.

Objective 2

Control will continue in identified wet heath and blanket bog locations where purple-moor grass is present for a minimum 5-year term of operation after which time the protocol will be assessed for effectiveness across the previous 5-year period. Markers of success will be a successive reduction in purple-moor grass in these locations year on year.

Objective 3

The following will be used as indicators of success on areas of blanket bog, as per MOORLife (2020).

- The water table is high (within 10cm of the surface most of the year) and the surface peat feels wet throughout the year (kneel on it, ideally your knees should get wet).
- Limited areas of bare peat showing signs of continuing erosion.
- A wide variety of bog species present – at least six of the following bog indicator species:
 - Heather (*Calluna vulgaris*)
 - Sundews (*Drosera* spp.)
 - Heaths (*Erica* spp.)
 - Crowberry (*Empetrum nigrum*)
 - Cotton grasses (*Eriophorum* spp.)
 - Bog asphodel (*Narthecium ossifragum*)
 - Non-crustose lichens
 - Feather mosses (*Pleurocarpus* mosses)
 - Reindeer moss (various *Cladonia* lichens)
 - Woolly hair moss (*Racomitrium lanuginosum*)
 - Sphagnum spp.
 - Deer grass (*Trichophorum cespitosum*⁴)
 - Bilberry, cranberry, cowberry *Vaccinium* spp.
- A good balance of vegetation types. As a rule of thumb, you should be able to see approximately 1/3 heather; 1/3 cotton grasses and at least 1/3 sphagnum with a range of other wetland species present. The more sphagnum the better; it should be ideally forming an understorey beneath the other species.
- The presence of hummock forming sphagnum mosses (e.g., *S. papillosum*, *S. capillifolium* and *S. magellanicum*⁵).

³ This is based on information in Table TS3-1 which assumes 'Heathland and shrub - Upland Heathland' as a correlate for wet heath as there is not a wet heath category.

⁴ latterly *T. germanicum*

- If burning or cutting management has taken place there should be no exposure of the peat surface or lasting ruts caused by vehicles.
- The presence of small pools of open water formed by pooling where the water table is high.

As blanket bog can take 30+ years to reach good target condition (Natural England, 2022) the programme will be reviewed and developed at year 5.

Objective 4

Broad-leaved riparian growth will be measured for growth rate and signs of grazing at years 3 and 5.

It is proposed to remove the existing impassable features at sites 7 and 8 and monitor these locations to confirm whether fish are subsequently able to pass (Figure 8.6). This will be carried out during the migratory season until it has been confirmed by an SQE that fish have passed. This can be secured by witnessing fish pass these locations or seeing fish immediately upstream, of these sites (whilst ensuring no other access points upstream of sites 7 and 8 and where the fish were seen).

Yearly checks up to the first 5 years will be made to ensure no new obstacles. Assuming that is the case the single visit, as described in the paragraph above, will be sufficient to clarify fish passage. The programme will be reviewed at year 5.

Objective 5

Tool-box talks will be logged in a site activity register with a log on personnel who have received the talk, and when. Talks should be repeated (for those staff who already received it) at a minimum of 6-month intervals. Additional talks may occur at the discretion of the ECoW and dependant on site conditions.

Objective 6

The first action is for the ECoW to survey grassland areas for the presence of (*Succisa pratensis*), which is the larval food-plant, or marsh fritillary itself.

Monthly checks for devil's bit scabious will be undertaken between August – October in each of years 1-5 in all suitable grassland areas; this is likely to exclude agricultural and improved grasslands.

Monthly checks for the larval food webs of marsh fritillary will be undertaken between February – March or August – October.

⁵ Latterly sub-divided into two species, *S.medium* and *S.divinum* with *S.medium* the more common.

4 References

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